Northern Wind Project

Draft Environmental Assessment

DOE/EA-1902

Roberts County, South Dakota

U.S. Department of Energy

Western Area Power Administration

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1.0 INTRODUCTION

Northern Wind (Project) is a wind generation project proposed by Northern Wind, LLC. The proposed Project is a 50 megawatt (MW) nameplate capacity wind farm which will generate on average approximately 25 MW annually. The proposed Project is located on 2,560 acres of privately owned land in Roberts County, South Dakota, approximately 8 miles north of Summit, South Dakota (**Figure 1**). The Project would interconnect to the U.S. Department of Energy (DOE) Western Area Power Administration (Western) Forman-Summit 115 kilovolt (kV) transmission line 7.4 miles north of the Summit Substation.

The interconnection agreement is a federal action under the National Environmental Policy Act (NEPA), Section 102(2) (1969), 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 the no-action alternative.

1.1 Need for the Proposed Project

According to the Energy Information Administration (EIA) (2009), South Dakota is ranked 7th in the nation in per capita energy consumption. Approximately 20 percent of South Dakota households use electricity as their primary energy source for home heating. Electricity in South Dakota is generated primarily by hydroelectric and coal-fired power plants. Hydroelectric power typically supplies approximately one-half of the electricity consumed in the state however new sources of hydroelectric power are not expected to be part of the overall energy production portfolio. South Dakota relies on shipments of coal from Wyoming to meet its coal demand. Energy sources such as coal, oil, and natural gas are finite, and their combustion has environmental consequences.

In February 2008, South Dakota enacted legislation (HB 1123) adopting a voluntary renewable portfolio objective that aims to have 10% of electricity generated from renewable sources by 2015. While South Dakota's wind resource is ranked 5th in the nation, at the end of May 2011, South Dakota was ranked 15th with an installed wind energy capacity of 784 MW (American Wind Energy Association 2011).

According to the National Renewable Energy Lab (2012), South Dakota's wind resource could provide 310 times the state's current electricity needs. In recent years, the Mid-Continent Area Power Pool (MAPP) has consistently reinforced the regional need for increased generating capacity in the coming decade. Cost fluctuations and reliability problems serve to reinforce the need for sufficient capacity, low-cost energy, and diverse generation sources. Independent power producers such as Northern Wind, LLC are widely recognized as essential to meeting regional energy needs, stabilizing energy costs, and enhancing energy reliability. The Project offers South Dakota the opportunity to add to capacity, to stabilize wholesale power prices, and to

provide electricity from a clean, cost-effective renewable energy generation facility. The Project is unique, being located on the "Coteau des Prairies" in northeastern South Dakota, which provides an excellent wind resource, while being located in eastern South Dakota relatively close to electrical load. The Project is relatively small (20 wind turbines) in comparison to many proposed projects in the state. Northern Wind has selected a project size appropriate to serve load in eastern South Dakota, while enjoying some economies of scale.

In addition to helping South Dakota meet its energy goals, the Project will provide local and regional economic benefits through construction, operations and maintenance, property tax, landowner income, and investor income. Northern Wind, LLC is developing and intends to own a 50 MW wind farm in southwestern Roberts County, South Dakota. The company is made up of local investors representing a cross section of the rural South Dakota landscape including farmers, ranchers, crop consultants, accountants, teachers, and other professionals. The Project is following a local-owned community business model with local investors providing at-risk investment to fund early development activities. Currently over 70 community members have invested in the Project. Local ownership of wind energy has been shown to have a greater economic impact to rural communities (Kildegaard, 2010). This Project will create new short and long term jobs, such as, meteorologists, surveyors, structural engineers, assembly workers, and technicians. The Project will diversify the rural economy by adding to the property tax base, providing direct lease payments to landowners, and creating income for the local investors. The goal of the Project is to create economic development at the community level by creating jobs and retaining locally, a portion of the sales of the renewable energy produced. If successful, the wind farm is anticipated to bring approximately 50 construction jobs, 2 long term management and operation jobs, and represents over a $100 million investment in rural northeast South Dakota.

1.2 Applicant's Underlying Need

Northern Wind, LLC needs to develop, operate, and maintain the generation infrastructure in order to develop the renewable wind resource.

1.3 Purpose of the Proposed Project

South Dakota has a unique opportunity to begin providing capacity to meet the forecasted deficits with clean, efficient, renewable energy. Once completed, the proposed Project will be a significant source of energy for meeting the region's needs over the next 30 years. The addition of the proposed Project will serve to meet the region's increasing energy needs.

1.4 Agency Purpose and Need

Northern Wind requests to interconnect its proposed Project with Western's Forman-Summit 115 kV transmission line. 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.

The US Fish and Wildlife Service (Service) has been identified as a cooperating agency on this project. On project lands where the Service has an existing easement and Northern Wind wishes to construct towers, transmission lines, and/or access roads, the Service will consider whether an exchange of interests in lands would be appropriate.

The Service has worked with Northern Wind and has determined that there are sites for project facilities that would have an acceptable minimal impact on the wildlife resources of the area. Since the Service determined that there are sites that are acceptable for wind power facilities, the Service will partially release its easement, for wind generation purposes only and with defined conditions, for a specified period of time on a specific release will include limitations on the siting density and size of the total development footprint (acreage) as described in this environmental assessment. In exchange for the partial release, Northern Wind will convey a perpetual grassland easement on other unencumbered acreage to the Service. The replacement easement must be acceptable to the Service and equal in value to the partial release of the Service's existing easement. When Northern Wind ends its use of the property for wind generation purposes or the partial release otherwise terminates, the Service will retain full grassland easements over both the original acreage that was subject to the partial release and the replacement acreage that was conveyed by Northern Wind.

1.5 Authorizing Action

Federal, state, and local agencies have jurisdiction over certain aspects of the proposed Project. Major federal agencies and their respective permit/authorizing responsibilities with respect to the proposed Project are summarized in **Table 1**.

TABLE 1. PERMIT / AUTHORIZATION RESPONSIBILITIES	
AUTHORIZING ACTION/STATUTE	**RESPONSIBLE AGENCY**
Interconnection/Transmission Service Agreement	Western
Utility Occupancy Agreement	South Dakota Department of Transportation (SDDOT)
Easement Grants and Road Crossing Permits	SDDOT, Spring Grove Township
Review and Approval of Land Use & Weed Control Plan	Roberts County, Spring Grove Township
National Environmental Policy Act	Western
National Historic Preservation Act	Sisseton Wahpeton Oyate Tribal Historic Preservation Office and South Dakota Historic Preservation Office
National Wildlife Refuge System Administration Act	U.S. Fish and Wildlife Service
Native American Graves Protection and Repatriation Act	Western
American Indian Religious Freedom Act	Western
Construction Storm Water Permit	South Dakota Department of Environment and Natural Resources
Clean Water Act Compliance	U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service
Safety Plan	South Dakota Occupational Safety and Health Administration
Migratory Bird Treaty Act	U.S. Fish and Wildlife Service, Western
Bald and Golden Eagle Protection Act	U.S. Fish and Wildlife Service, Western
Endangered Species Act	U.S. Fish and Wildlife Service, Western
Tower Lighting	Federal Aviation Administration

1.6 Public Participation

Western has consulted with the various federal, state and local agencies (listed in **Section 4.0** of this document) in the development of this analysis. A public scoping meeting was held on October 13, 2011 in Wilmot, South Dakota. A summary of the public meeting is included in **Appendix A**. The written comments received from agencies and the public during the scoping periods are included in **Appendix B**. In addition, Western will consider comments on this EA from agencies, tribes, landowners, and other interested parties.

On December 6, 2011, government-to-government consultation occurred between Western and tribal representatives of the Sisseton Wahpeton Oyate Tribal Historic Preservation Office (THPO) and other interested tribes. The Project is located on privately held land within the boundaries of the Lake Traverse Reservation.

The Project owners requested that a representative of the United States Department of Agriculture (USDA) Rural Development also participate to accommodate future grant and loan requests.

2.0 DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

Northern Wind, LLC, proposes to construct, own, and operate Northern Wind in Roberts County, South Dakota. The Project will consist of no more than 20, 2.5 MW wind turbines for a 50 MW nameplate capacity generation.

The site selection was based on a number of factors including the wind resource, the accessibility to the existing electrical grid, the receptiveness of the local community to wind energy development, the participation of the landowner in the local ownership group, and numerous environmental factors and economic considerations. The local wind energy project committee first chose to commission a meso-scale meteorological assessment of the wind resource. The initial assessment results indicated that an area along the eastern edge of the South Dakota Coteau had high wind speeds and tremendous wind energy production potential. Project layout was then designed to avoid and minimize impacts at the chosen site. Existing infrastructure at the site, 458th Avenue and the 115 kV transmission line, reduce the amount of new roads required, eliminate the need for a new transmission line, and reduce total Project footprint and impacts. This site is also located adjacent to Interstate Highway 29 which will facilitate transportation and delivery of Project components. In addition, the proposed 2.5 MW rated turbines minimize the footprint of the Project by lowering the number of wind turbines required to accomplish the 50 MW nameplate production goal.

This section describes the pre-construction activities, the proposed Project and the No Action Alternative.

2.1 Pre-Construction Activities

Pre-construction activities included site surveys and studies, landowner agreements, and planning and design of Project facilities.

Preconstruction Surveys and Studies

Pre-construction surveys and studies were conducted to ensure the feasibility of the proposed Project and to avoid, minimize, or mitigate impacts to existing resources. Detailed discussions of the pre-construction surveys and studies are included in Sections 2.0 and 3.0. These surveys and studies include:

- Avian Survey
- Bat activity Survey and Bat Likelihood of Occurrence Assessment
- Bald Eagle Nest Survey
- Native Prairie Survey
- Dakota Skipper and Poweshiek Skipperling Survey
- Wetland Delineation
- Cultural Resources Inventory

Landowner Agreement

The Project proponents entered into exclusivity and lease option agreements with the landowners in order to secure rights to access the property for surveys, testing, construction, operation, and maintenance of the Project components. The majority of the wind farm (2,480 acres) is sited on ranch land owned and leased from Whipple Ranch Incorporated. Mr. Bill Whipple, the owner, is on the Board of Directors of Northern Wind, LLC. An additional 80 acres of land adjacent to the Whipple Ranch was leased from Roger and Diane Aadland. This additional 80 acres was leased to accommodate an additional turbine location to avoid issues with wake loss, cultural resources, and Dakota skipper habitat. The land includes Conservation Reserve Program (CRP) contract lands and Service grassland and wetland easements. Wind turbines are proposed to be installed on land that is included in existing CRP contracts and grassland easements. The land use within the grassland easements has traditionally been used for cattle grazing and will continue to be grazed post-construction. These agreements were developed in consideration of landowner concerns and addresses compensation for disturbance and loss of farming access during Project construction, operation, and maintenance. Landowner agreements are in place for all land within the Project boundaries.

2.2 Proposed Project

The Project is located approximately 8 miles northwest of the rural community of Summit in northeast South Dakota (**Figure 2**). The proposed Project would consist of the following components:

- 20, 2.5 MW Nordex N90 turbines or equivalent
- 1 meteorological (met) tower with an option for a second
- Access roads
- Underground electrical collection lines
- Operations and maintenance (O&M) building
- 1 collection substation adjacent to the Forman-Summit 115 kV transmission line

All facilities would be constructed in accordance with the National Electrical Safety Code (NESC) and U.S. Department of Labor Occupational Safety and Health Administration (OSHA) standards for maximum safety and property protection. The following sections describe the Project facilities, pre-construction activities, construction activities, operation and maintenance, decommissioning, construction waste management, restoration and reclamation, and environmental protection measures.

2.2.1 Proposed Project

The Project will consist of an array of wind turbines and transformers. The turbines will be interconnected by fiber optic communication cables and 34.5-kV direct buried power collection cables.

Land will be graded on-site for the turbine pads. Drainage systems, access roads, storage areas, and construction/laydown areas will be installed as necessary to fully accommodate all aspects of Project construction, operation, and maintenance.

Electrical system design and interconnection details will be determined as a result of studies and discussions with Western. The Project includes a computer-controlled communications system that permits automatic independent operation and remote supervision allowing the simultaneous control of many wind turbines. Northern Wind, LLC, is anticipated to be responsible for Project operation and maintenance for the life of the Project and will contract with the most appropriate supplier of O&M services at the time of operation to assure timely and efficient operations.

Turbines

The Project is proposed to consist of 20, 2.5 MW turbines (**Figure 3**). The turbine begins operation in wind speeds of 3.0 meters per second (m/s), or 6.7 miles per hour (mph) and reaches its rated capacity (2.5 MW) at a wind speed of 13.0 m/s (29 mph). The turbine is designed to operate in wind speeds of up to 25 m/s (55 mph). The turbines have active yaw and pitch regulation and doubly fed asynchronous generators.

The turbines have supervisory control and data acquisition (SCADA) communication technology to allow control and monitoring of the wind farm. The SCADA communications system permits automatic, independent operation and remote supervision allowing for the simultaneous control of many wind turbines. Operations, maintenance, and service for the Project will be structured to provide timely and efficient operations. The computerized data network will provide detailed operating and performance information for each wind turbine. Northern Wind will maintain a computer program and database for tracking each wind turbine's operational history.

Other specifications of the turbines include:

- Rotor blade pitch regulation independently control the pitch angle of the blades
- Gearbox with multi-stage planetary and one-stage spur gear
- Doubly fed three-phase asynchronous generator with cooling circuit for optimum temperature control
- Aerodynamic braking system controls each rotor blade independently and the wind turbine is also equipped with a mechanical brake
- Yaw system includes 3 asynchronous motor drives with hydraulic disc brakes and includes a second electrical spring-actuated brake on each motor

Rotor

The rotor consists of three blades mounted to a rotor hub. The hub is attached to the nacelle, which houses the gearbox, generator, brake, cooling system, and other electrical and mechanical systems. The rotor consists of three rotor blades made of high-quality glass fiber-reinforced polyester, a hub, slewing rings, and drives for adjusting the rotor blades. A pitch system is used to control and optimize output. The variable-

speed rotor enhances the aerodynamic effects and reduces the wind load on the system. Each rotor blade can be locked in any position by means of an innovative locking system to facilitate servicing. The preliminary turbine design identifies a 100 meter (328-feet) rotor diameter, with a swept area of 7,854 square meters (84,539 square feet) and a rotor speed of 10.3-18.1 revolutions per minute (rpm).

Tower

The towers are constructed of tubular steel with a hub height of up to 80 meters (262.5 feet). The turbine tower, on which the nacelle is mounted, consists of three to four sections manufactured from certified steel plates. The tubular steel tower is designed and certified as a modular tower. The requirements of European Standard, EN 50308 - Protective Measures, have been taken into account in the design of the tower interiors (access ladder, platforms, safety equipment). Corrosion protection of the tubular steel tower is achieved by a coating system of the tower surface in accordance with International Organization for Standardization, ISO 12944 – Paints and Varnishes. Access to the turbine is through a lockable steel door at the base of the tower.

Lightning Protection

Each turbine is equipped with a lightning protection system. The blades are equipped with lightning receptors to conduct the lightning to the rotor hub. Lightning and overvoltage protection of the entire wind turbine is based on the lightning protection concept and is in accordance with DIN EN 62305. The turbine is grounded and shielded to protect against lightning. The grounding system will be installed during foundation work and must be designed for local soil conditions. The resistance to neutral earth must be in accordance with local utility or code requirements.

Electrical System

At the base of each turbine, a step-up transformer will be installed to raise the wind turbine generator output voltage of 660 volts to the power collection line voltage of 34.5 kV. The power from these wind turbines will be routed through an underground collection system consisting of various sized direct-buried cables that are generally located alongside the Project access roads. At the point where the access and public roads meet, the collection system will continue as underground lines. Eventually, all the collection system cables will terminate at an on-site collector wind farm substation, which raises the Project voltage to 115 kV and provides the necessary protection and control for interconnection to the transmission grid. The substation will be constructed in the SE quarter of Section 16 of Township 123 North (Spring Grove Township), Range 51 West near existing transmission structures 123-6 and 123-7 along the Western Forman-Summit 115 kV transmission line (**Figure 4**). No new overhead transmission lines will be required.

The one line diagram (**Figure 5**) is a bird's eye view of how the substation will be laid out and illustrates the point of interconnection. It shows the associated equipment and their ratings as well as the equipment labels for developing the switching order at time of energization.

All utility protection and metering equipment will meet NESC standards for parallel operations. The construction manager will ensure that proper interconnection protection is established.

Operations and Maintenance Facility

The proposed 2,400 square foot O&M facility will be located in Section 16 of Township 123 North, Range 51 West along 458th Avenue near the proposed Project substation.

Met Tower

A met tower was installed in April, 2011 and is 60 meters (164 feet) high. The tower is an open lattice design and is secured with several guy wires. The met tower is located in the SE quarter of Section 16, Township 123 North, Range 51 West and complies with setbacks specified in the Roberts County South Dakota Article 28 Draft Wind Energy Systems Zoning Requirements Ordinance. The met tower is permitted by Roberts County. The tower measures wind speed at the 60 meter, 50 meter, 40 meter and 10 meter heights. Wind direction is measured at the 50 and 60 meter heights. The tower is marked with diverter balls (for planes), which also serve as bird diverters. Typically the met tower remains in-place after construction for one to three years to verify the turbine production matches the manufacture's production claims, built in sensors, etc. The location of the tower is shown on **Figure 2.**

2.2.2 Construction Procedures

Several activities must be completed prior to the proposed commercial production date. The majority of the activity relates to equipment ordering lead-time, as well as design and construction of the facility. Below is a preliminary schedule of activities necessary to develop the Project. Pre-construction, construction, and post-construction activities for the Project include:

- Ordering of all necessary components including towers, nacelles, blades, foundations, and transformers
- Final turbine micrositing
- Complete survey to microsite locations of structures and roadways
- Soil borings, testing and analysis for proper foundation design and materials
- Install laydown-staging construction yard approximately 5 acres in size
- Complete construction of access roads, to be used for construction and maintenance
- Construction of underground collection lines
- Design and construction of the Project substation and 115-kV interconnection to the Western Forman-Summit 115 kV transmission line per Western requirements
- Installation of tower foundations
- Installation of underground communication cables and collector wires
- Tower placement and wind turbine setting
- Acceptance testing of facility
- Commencement of commercial production date

Private 16 foot turbine access roads will be built allowing access to the turbines during and after construction. The roads are constructed by preparing the subgrade to a depth of 6 inches at a width of 16 feet. Preliminary design consists of 8 inches of gravel aggregated surface on the 16 foot width. Material will be compacted with appropriate equipment as required to support the size and weight of construction and maintenance vehicles. Preliminary estimates provided by the balance of plant contractors indicated 30,725 linear feet (5.8 miles) of turbine access roads. The specific turbine placement will determine the final amount of private roadway that will be constructed for the Project. Crane paths will follow access roads when available. To avoid costly full crane breakdowns and reconstruction, approximately 4.6 miles of crane path is estimated during construction. Crane paths that do not coincide with turbine access roads will be prepared and reseeded with appropriate grass mixture in consultation with Service personnel. Approximately 12 access road approaches will be constructed to a 135 foot radius to allow material delivery, particularly tower sections and turbine rotor blades, during the construction phase. At approximately 13 locations where turbines are located at the end of the access roads, a turnaround will be constructed of compacted earthen material with an outside radius of 160 feet and an inside radius of 130 feet.

An 80 foot x 40 foot x 1 foot compacted earthen crane pad laydown area will be constructed at each turbine location. Crane pads will be removed when construction is complete and the area reseeded. When turbine construction is complete, an 8 foot wide ring of 4 inch deep gravel will be placed around each turbine. During the construction phase, several types of light, medium, and heavy-duty construction vehicles will travel to and from the site, as well as private vehicles used by the construction personnel. Heaviest construction traffic volume will occur during the peak time when the majority of the road, foundation, and tower assembly are taking place. Water trucks will be utilized for dust control as needed during the construction phase.

Construction Management

An engineering, procurement, and construction (EPC) contractor will be primarily responsible for the construction management of the Project. The EPC contractor will use the services of local contractors, where possible, to assist in Project construction. The EPC contractor, in coordination with local contractors, will undertake the following activities:

- Securing building, electrical, grading, road, and utility permits
- Perform detailed civil, structural, and electrical engineering
- Schedule execution of construction activities
- Complete surveying and geotechnical investigations
- Forecast Project labor requirements and budgeting

The EPC contractor also serves as the key contact and interface for subcontractor coordination. The EPC contractor will oversee the installation of communication and power collection lines as well as the substation.

The EPC contractor will also oversee the installation of roads, concrete foundations, towers, machines, and blades, as well as the coordination of materials receiving, inventory, and distribution. The Project will be constructed under the direct supervision of an on-site construction manager with the assistance of local contractors. The construction consists of the following tasks:

- Site development, including roads
- Foundation excavation
- Concrete foundations
- All electrical and communications installation
- Tower assembly and machine erection
- System testing

The construction team will be on-site to handle materials purchasing, construction, quality control, testing and start-up. The EPC contractor will manage local subcontractors to complete all aspects of construction.

Throughout the construction phase, ongoing coordination will occur between the Project development and the construction teams. The on-site Project construction manager will help to coordinate all aspects of the Project, including ongoing communication with local officials, citizen groups, and landowners. Before the Project becomes fully operational, the O&M staff is integrated into the construction phase of the Project. The construction manager and the O&M staff manager will work together to ensure a smooth transition from construction through wind farm commissioning and operations.

Foundation Design

The wind turbine freestanding tubular towers will be connected by anchor bolts to an underground concrete foundation. Geotechnical surveys, turbine tower load specifications, and cost considerations will dictate final design parameters of the foundations. Foundations for similar sized turbines are generally octagonal, approximately 40 to 65 feet across at the base of the spread footing, and extend seven to ten feet below grade. The area is cleared with a bulldozer and/or road grader and excavated with a backhoe to prepare for each concrete foundation. Excess excavated material will be used for road construction or otherwise disposed of in accordance with all applicable regulations and permit conditions. An anchor bolt cage, embedment ring, and tower base flange are installed per turbine manufacturer's specifications and concrete is placed into the hole. Approximately 650 cubic yards of concrete are needed for each turbine. Concrete spoil would be disposed of off-site by the contractor. Once cured, the foundation would be complete and ready to receive the turbine tower. The wind turbine foundation design will be prepared by a registered professional engineer.

Civil Works

Completion of the Project will require various types of civil works and physical improvements to the land. These civil works may include the following:

- Construction of roads to the wind turbines to allow construction and continued servicing of the wind turbines
- Clearing and grading for wind turbine tower foundation installations
- Installation of underground cabling for connecting the individual wind turbines
- Installation of underground collection cabling to connect wind turbines power to the electricity collection/metering location, i.e. wind farm substation
- Clearing and grading for the O&M building
- Installation of any site fencing and security
- Restoration and revegetation of disturbed land when construction activities are completed

Approximately 5.8 miles of turbine access roads will be constructed. These roads will be completed in accordance with local building requirements where these roads intersect with public roads. They will be located to facilitate both construction and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. All roads will include appropriate drainage and culverts. The roads will be 36 feet wide and will be covered with road base designed to allow passage under inclement weather conditions. The roads will consist of a 16 feet wide aggregate surface. Once construction is completed, the roads will be regraded, filled, and dressed as needed.

Approximately 8.3 miles of underground collection line would be installed as part of the Project. The collection line cable would consist of a cable buried in trenches at a depth of approximately 50 inches. High voltage marking tape will be installed 12" above the cable. The method of cable installation anticipated is direct burial plowing. Top soil will be dozed off prior to trenching and replaced as the top layer following installation. The trench area will be backfilled and compacted in lifts as needed to prevent settling and cable heating due to voids. Trenched areas and associated disturbances will be reclaimed following burial of electrical cables. Cable trenches are designed to follow access roads wherever possible to avoid additional ground disturbance. More direct paths will be implemented where following access roads is not economically feasible and sensitive resources can be avoided (**Figure 2**).

Where collection lines would cross wetlands and other sensitive features, horizontal directional drilling (HDD) below the features may be used to avoid any impacts.

Commissioning

The Project will be commissioned after completion of the construction phase. The Project will undergo detailed inspection and testing procedures prior to final turbine commissioning. Inspection and testing will occur for each component of the wind turbines, as well as the communication system, meteorological system, obstruction lighting, high voltage collection and feeder system, and the SCADA system.

2.2.3 Project Operation and Maintenance

Northern Wind and the appropriate supplier will control, monitor, operate, and maintain the Project by means of an operation control computer and software program. In addition to regularly scheduled on-site visits, the wind farm may be monitored via computer. The operation of the entire wind farm is managed by the centralized SCADA system. The Project operation and maintenance is anticipated to be overseen by Northern Wind, LLC.

The SCADA system offers access to wind turbine generation or production data, availability, meteorological, and communications data, as well as alarms and communication error information. Performance data and parameters for each machine (generator speed, wind speed, power output, etc.) can also be viewed, and machine status can be changed.

The primary functions of the SCADA system are to:

- Ensure automatic and safe operation of wind turbines in all situations
- Monitor wind farm status
- Allow for autonomous turbine operation
- Alert operations personnel to wind farm conditions requiring resolution
- Provide a user/operator interface for controlling and monitoring wind turbines
- Collect meteorological performance data from turbines
- Monitor field communications
- Provide diagnostic capabilities of wind turbine performance for operators and maintenance personnel
- Provide information reporting on a regular basis

Maintenance Schedule

Northern Wind will remotely monitor the Project on a daily basis. This will be accompanied by a visual inspection by the on-site operating staff. Several daily checks will be made in the first three months of commercial operation to see that the Project is operating within expected parameters.

Once installed, the Project service and maintenance is carefully planned and divided into the following intervals:

- First service inspection
- Semi-annual service inspection
- Annual service inspection
- Two years service inspection
- Five years service inspection

First Service Inspection. The first service inspection will take place one to three months after the turbines have been commissioned. At this inspection, particular attention is paid to tightening all bolts by 100 percent, a full greasing, and filtering of gear oil.

Semi-Annual Service Inspection. Regular service inspections commence six months after the first inspection. The semi-annual inspection consists of lubrication and a safety test of the turbines.

Annual Service Inspection. The annual service inspection consists of a semi-annual inspection plus a full component check. Bolts are checked with a torque wrench. The check covers 10 percent of every bolt assembly. If any bolts are found to be loose, all bolts in that assembly are tightened 100 percent and the event is logged.

Two Years Service Inspection. The two years service inspection consists of the annual inspection, plus checking and tightening of terminal connectors.

Five Years Service Inspection. The five years inspection consists of the annual inspection, an extensive inspection of the wind braking system, checking and testing of oil and grease, balance check, and tightness of terminal connectors.

General Maintenance Duties

O&M field duties include performing all scheduled and unscheduled maintenance, including periodic operational checks and tests, regular preventive maintenance on all turbines, related plant facilities and equipment, safety systems, controls, instruments, and machinery, including:

- Maintenance on the wind turbines and on the mechanical, electrical power, and communications system
- Performance of all routine inspections
- Maintenance of all oil levels and changing oil filters
- Maintenance of the control systems, all Project structures, access roads, drainage systems and other facilities necessary for the operation
- Maintenance of all O&M field maintenance manuals, service bulletins, revisions, and documentation for the Project
- Maintenance of all parts, price lists, and computer software
- Maintenance and operation of Project substation
- Provide all labor, services, consumables, and parts required to perform scheduled and unscheduled maintenance on the wind farm, including repairs and replacement of parts and removal of failed parts
- Manage lubricants, solvents, and other hazardous materials as required by local and/or state regulations
- Maintain appropriate levels of spare parts in order to maintain equipment

- Order and maintain spare parts inventory
- Provide all necessary equipment including industrial cranes for removal and reinstallation of turbines
- Hire, train, and supervise a work force necessary to meet the general maintenance requirements
- Implement appropriate security methods

2.2.4 Decommissioning

Northern Wind has a contractual obligation to the landowner to remove the wind energy facilities, including foundations to a depth of four feet, when the wind easement expires. Northern Wind also reserves the right to explore alternatives regarding Project decommissioning at the end of the Project certificate term. Retrofitting the turbines and power system with upgrades based on new technology may allow the wind farm to produce efficiently and successfully for many more years. Based on estimated costs of decommissioning and the salvage value of decommissioned equipment, the salvage value of the wind farm will exceed the cost of decommissioning. When Northern Wind ends its use of the property for wind generation purposes, the Service will retain full grassland easements over the original acreage that was subject to the Service partial release.

2.2.5 Construction Waste Management and Restoration/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. Materials with salvage value will be removed from the Project area for reuse. Excavated spoils will be back-filled within the area of permanent disturbance and restored in compliance with applicable guidelines. If necessary, solid waste, including topsoil or other excavated materials not otherwise disposed of, would be temporarily stored within the corridor or within the temporary construction easements, and then transported to appropriate disposal facilities in accordance with federal, state, and local regulations.

Following construction, areas not maintained as permanent facilities would be reclaimed for their prior land use. Reclamation would initially consist of grading to replace the approximate original contour and drainage of disturbed areas. Grading would include removal of any temporary crossing or drainage control structures. Following grading, salvaged topsoil would be spread and blended with adjacent areas to provide a growth medium for vegetation. Soil that has been compacted by equipment operation would be tilled to alleviate compaction and prepare a seed bed. Where natural regrowth of vegetation is not anticipated, disturbed areas would be reseeded in accordance with landowner agreements and with regionally native species. Noxious weeds will be controlled in accordance with state regulations.

2.2.6 Environmental Protection Measures

Although Northern Wind has minimized environmental impacts to the extent practical through siting, impacts will be further minimized by implementing the following measures:

- Unless otherwise permitted or approved, Northern Wind will avoid all cultural, environmental, and biological sensitive resources during siting, construction, maintenance, and operations.
- Northern Wind will consult with interested tribes to develop additional measures to protect traditional cultural properties (TCP) if any are identified.
- Crews will use silt fencing, straw bales, and ditch blocks during access road construction and electrical line trenching on sloped ground or at ephemeral drainage crossings within the Project area to further minimize erosion and related environmental impacts.
- Project lighting will conform to the best management practices outlined in the LBWEGs. Plans for any temporary safety lighting associated with night-time construction or maintenance activities during spring and fall migration will be developed in consultation with the Service and SDGFP to ensure that the lighting will not disrupt bald eagle and northern long-eared bat migration. Lighting of turbines and other permanent infrastructure will be limited to the extent feasible in accordance with the Federal Aviation Administration to reduce the potential for attracting nocturnal migrants. External lighting at substations will utilize down shields and operation staff will be required to turn off internal turbine lights.
- Introduction of noxious weeds will be mitigated through prompt revegetation with regionally native species or restoration of prior land use. A Clean Vehicle Program will be initiated which will require the inspection and washing of vehicles and construction equipment from outside the Project area to remove adhered soils and plant debris prior to entry into the Project area.
- Vehicle speeds of no more than 15 mph on turbine access roads will be required to minimize dust and wildlife collisions.
- Roads will be watered as needed during construction to minimize dust.
- Appropriate erosion control measures will be installed and maintained to avoid placement of fill in wetlands near Project facilities.
- Signs will be installed where construction vehicles frequently enter or exit 458th Avenue. Signs will be installed in consultation with the SDDOT.
- Wetlands will be flagged to ensure avoidance by a minimum of 50 feet.
- An environmental monitor will be assigned to the Project by the EPC contractor during construction to make sure all of the identified environmental protection measures are being adhered to. The environmental monitor will complete daily inspections of all construction activity and report any environmental incidents to Northern Wind. The environmental monitor will have the authority to cease construction activities pending compliance with the identified environmental protection measures.

Specifically regarding potential impacts to potentially occurring federally threatened and endangered species, Northern Wind has committed to the following additional avoidance and minimization measures:

- Northern Wind will bury all new collection lines from the turbines to the collection substation to avoid avian collision risks. The wind farm substation power will connect to the existing Foreman-Summit 115-kV Transmission Line from the high side structure in the substation, per Western requirements, with 1 overhead transmission line approximately 50 – 100 feet in length. The development of the Project will not require the construction of any other additional overhead transmission lines. As a result, Project construction will not create the risk of avian collision or electrocution with overhead transmission lines.
- Northern Wind will follow the Service Land-Based Wind Energy Guidelines for post-construction studies to assess whether predictions of fatality risk and direct and indirect impacts to habitat of species of concern were correct. Fatality studies involve searching for bird and bat carcasses beneath turbines to estimate the number and species composition of fatalities. At least one full year of fatality studies will be completed. Additional year(s) of fatality studies will be considered pending the results of the first year studies. Habitat studies involve application of GIS and use data collected at the site and/or published information. Post-construction studies on direct and indirect impacts to habitat of species of concern, including species of habitat fragmentation concern will only be conducted if field studies indicate the potential for significant adverse impacts.
- The turbine cut-in wind speed will be 3.0 m/s. Northern Wind will utilize the post construction monitoring to determine if increased cut-in speeds are needed. Turbine blades may be feathered below a cut-in speed of 6.9 m/s to further reduce turbine collision risk to bats.
- Northern Wind will mitigate grassland easement acres affected by the footprint of access roads, substation, O&M building, and turbines by providing a grassland easement of an area equal to these permanently affected areas. Northern Wind will consult with the Service to identify acceptable land in proximity to the wind farm that will accomplish this mitigation.
- Northern Wind will off-set potential effects to threatened and endangered species, grassland birds, migratory birds and bats through enrolling 240 acres of land in Service grassland easements. Conservation measures will be implemented on these easements to provide high quality habitat for these species.
- The layout of the Project has been designed so that no permanent impacts to wetland areas will occur. As a result, direct effects on roosting, nesting, or foraging birds will be reduced. Also, avoiding wetland impacts will reduce potential impacts to migratory birds, including waterfowl.

2.2.7 Mitigation Management Plan

Northern Wind will off-set potential effects to threatened and endangered species, grassland birds, migratory birds and bats through enrolling 240 acres of land in FWS grassland easements. Conservation measures will be implemented on these easements to provide high quality habitat for these species. In addition, the 240 acres will protect native prairie from cropland conversion. The 240 acres of land are being proposed in three segments.

Northern Wind plans to enroll 100 acres of land in the FWS grassland easement program once a Finding of No Significant Impact is issued through the NEPA EA review. These 100 acres will be enrolled in the FWS grassland easement program regardless of whether or not the Project is constructed. The mitigation site is located in the Prairie Coteau Ecoregion approximately 13 miles southwest of the Project area. The mitigation

acres consist of high quality native prairie, native prairie pasture land, and a recently planted CRP. This parcel of land is along the eastern shore of Anderson Lake which has a known fish population. Approximately 22 of the 100 acres is high quality native prairie that has never been tilled or grazed. These 22 acres contain a highly diverse native prairie plant community. Another 37 acres is native prairie pasture land with the remaining 41 acres planted in a native grass CRP mix.

An additional 40 acres adjacent to the proposed 100 acre site will be enrolled in the FWS grassland easement program if the Project is constructed (**Figure 6**). This 40 acre parcel is connected to the 100 acre parcel in the northeast corner of Anderson Lake. The 40 acre parcel consists of 18 acres of crop land with 32 acres of native prairie and wetlands. The 18 acres of cropland will be planted with a native prairie grass mix. The addition of these 40 acres provides further reduction in habitat fragmentation, increases grassland and migratory bird habitat, increases wetland habitat within the easement, and increases water quality within the watershed (removing crop production).

The mitigation site is located along the northeast border of over 500 acres of existing Service grassland easement (**Figure 6**). The addition of the proposed 140 (100 acres at the FONSI and 40 additional acres after the proposed Project construction, mentioned below) mitigation acres will create a continuous grassland easement of over 640 acres reducing habitat fragmentation.

Northern Wind is working with Ducks Unlimited to provide an additional 100 acres of grassland easement if the Project is constructed. The location of this 100 acres of land has yet to be determined. Northern Wind will work with Ducks Unlimited and the FWS to identify and secure an appropriate parcel to enroll in the grassland easement program.

2.2.8 Conservation Measures

Conservation measures for the Dakota skipper, Poweshiek skipperling, grassland birds, migratory birds, eagles and bats are discussed below.

<u>Dakota Skipper and Poweshiek Skipperling</u>
High quality Dakota skipper and Poweshiek skipperling habitat, species listed as threatened and endangered under the ESA, respectively, exists within the mitigation area. The site contains native mixed grass prairie with large populations of plant species that are favored nectar sources for skippers and skipperlings. Conservation measures to maintain and improve habitat on the mitigation acres for the Dakota skipper and Poweshiek skipperling would include; preventing invasion of Kentucky bluegrass and smooth brome grass which are aggressive invaders of native prairie, late season mowing/haying, and non-destructive chemical control of invasive species (Royer and Marronne 1992).

The mitigation area will be managed with grazing, fire, or haying to prevent its loss due to succession or degradation. The preferred method of grassland management by Northern Wind will be haying and weed/invasive species control as outlined below. Prescribed burns and grazing will likely not be utilized but in the case that prescribed burning or grazing is warranted, Northern Wind will follow the procedures described in the Dakota Skipper Conservation Guidelines.

Haying and Native Seed Harvest (from Service 2013b)

- Hay or collect seed after mid-August to reduce the likelihood of removing or destroying Dakota skipper eggs and to avoid removing nectar sources during the flight period. If it is not feasible to wait until mid-August, delay haying at least until the Dakota skipper flight has ended locally to ensure that reproductive activity of adults is not affected. In general, hay or mow as late as is feasible to reduce the likelihood of adverse effects to any life stage.
- Leave at least 20 cm (8 inches) of stubble to provide habitat for over-wintering larvae. The ideal time to mow may be after Dakota skipper larvae have entered diapause (i.e., have become dormant in preparation for winter). Although there is no convenient method to know when this has occurred, the senescence of native warm-season grasses may be a good indication that Dakota skippers have entered diapause.
- As with annual burning, annual haying may reduce plant diversity in tallgrass prairie. Therefore, hay in alternate years or subdivide the habitat into multiple units and leave at least some of the units unhayed each year. Resting hay units may also reduce the impacts of any adverse effects that may occur from haying that is conducted early enough to adversely affect Dakota skippers or other species dependent on native prairie (e.g., Ottoe skipper, H. ottoe).

Weed/Invasive Species Control (from Service 2013b)

- Avoid broadcast applications of pesticides or herbicides that may be harmful to Dakota skippers or their nectar plants in Dakota skipper habitat.
- Ensure that field crews recognize target weeds to avoid adverse effects to important native species.
- Manage sites to minimize the likelihood of invasion by weeds. Control methods that are necessary after invasion may have unintended consequences to Dakota skipper or other native species.

Conservation measures that will be followed within the Northern Wind Project area include; habitat preservation, weed/invasive species control and grazing. The identified Dakota skipper and Poweshiek skipperling habitat within the project area is located on steep slopes with remnant native prairie habitat. These areas will be preserved by avoiding any conversion of these habitats to other uses. The identified habitats will be avoided by project components and will remain as pasture land. These areas will not be used for crop production. Weed/Invasive species control will be managed as described above. The current grazing management plan within the Northern Wind Project area includes rotational and low intensity grazing. Whenever feasible, the grazing management plan will follow the grazing guidelines outlined below. The grazing guidelines will be particularly followed in identified Dakota skipper and Poweshiek skipperling habitat.

Restoration will not be part of the conservation measures. Successful restoration of Dakota skipper habitat has not been demonstrated and butterfly species diversity is lower on restored land than on remnant prairies (Shepherd & Debinski 2005).

Grazing (from Service 2013b)
Beyond a certain level, grazing is likely to adversely affect Dakota skipper populations in proportion to its intensity because it removes nectar sources and degrades native prairie plant communities (e.g., increases coverage of invasive/non-native species), leading to a reduction in larval food plants. Therefore, limit the duration and intensity of grazing for the conservation of the Dakota skipper and the native prairie ecosystem.

- Avoid grazing regimes that remove a significant proportion of floral nectar resources during the flight period. To protect nectar resources and vegetation for egg deposition and larval food (warm season grasses) in South Dakota, for example, "it may only be feasible to graze dry-mesic prairie slopes in the spring (April – May) before the growth of warm season grasses and forbs begins, with a minimum one-year rest period between rotations" (Skadsen 2003).
- As with haying, Skadsen (2003) also recommended that grazing never reduce stubble heights below 20 cm (8 inches) in tallgrass prairie.
- Do not graze Dakota skipper habitats for the entire season – include at least one period of rest during the growing season and do not graze a site during the same time each year.
- Purple coneflower (Echinacea angustifolia) and other important nectar species may be good indicators of grazing effects. For example, declines in purple coneflower may be indicative of current or pending adverse effects to Dakota skippers due to reduction in nectar sources and general degradation of the prairie plant community.

<u>Northern Long-Eared Bat</u>
The Wind Turbine Guidelines Advisory Committee has provided recommended BMPs to the Service for the reduction of bat-collision impacts at wind energy facilities. These practices include but are not limited to: avoidance of areas having demonstrated high risk to bats (e.g. areas near hibernacula) and maintaining connectivity between roosting and nesting sites and foraging areas (Lou Hanebury, personal communication, November 11, 2013).

Predisturbance site surveys have been completed at the Northern Wind Project area, and 22.2% of bat passes were classified as high-frequency (HF) (i.e., eastern red bats, little brown bats, and northern long-eared bats). A total of 325 HF bat passes were detected from April 17 to October 1, 2012 for a mean of 1.28 HF bat passes per detector night (Chodacheck and Murray 2013). The number of bat passes contributed by the northern long-eared bat is unknown. At a minimum, Northern Wind has followed the conservation measures below:

- Do not site turbines in areas within 20 mi (32 km) of hibernacula used by northern long-eared bats or within 1000 ft (300 m) of suitable foraging and roosting habitat (edges along forested areas with dense forest canopy, riparian areas and small wetlands).

- Immediately report observations of northern long-eared bat mortality to the appropriate FWS office.

The Northern Wind Project area is not within 20 miles of any known hibernacula and does not contain any areas with dense forest canopy. The only forested areas are located in the steep drainages all of which are greater than 1000 ft from any turbine location. If post-construction bat mortality surveys identify northern long-eared bat fatality risk, then the additional conservation measures listed below will be explored by Northern Wind in coordination with the Service.

- Increase turbine cut-in speed (wind speed at which turbines begin producing electricity into the power grid) by 1.5 m/s above the manufacturer's cut-in speed of 3.0 m/s, for an operational cut-in speed of 4.5 m/s.
- Feather the turbine blades to render them basically motionless below the cut-in speed of 6.9 m/s.

Feathering turbine blades (pitched 90^{o} and parallel to the wind) at or below the manufacturer's cut-in speed resulted in up to 72% fewer bats killed when turbines produced no electricity into the power grid. In some studies, a 50% reduction in bat fatalities was observed when turbine cut-in speed (wind speed at which turbines begin producing electricity into the power grid) was increased by 1.5 m/s above the manufacturer's cut-in speed (Arnett et al 2011).

In addition to the conservation measures mentioned above, potential bat fatalities may be off-set through the enrollment of the 240 acres of grassland easement. The 140 acre mitigation area has quality foraging habitat for migratory bats including the northern long-eared bat due to the presence of wetlands and Anderson Lake. The additional 100 acres of proposed grassland easement will provide additional foraging habitat.

Eagles and other birds

Northern Wind has minimized impacts to grassland and migratory birds within the project area by burying all transmission and communication lines, minimizing road widths, avoiding wetlands, removing turbines from the highest quality habitats in the north, and micrositing turbines to avoid other high quality habitats.

The mitigation area conservation measures and BMPs mentioned above will also benefit grassland and migratory bird species. The addition of 140 acres of high quality native prairie, wetlands/waterbodies, and shore land to the existing 500+ acres of FWS grassland easement will provide over 640 acres of continuous grassland habitat. The additional 100 acres of mitigation land that will be developed in cooperation with Ducks Unlimited will be designed to benefit grassland and migratory birds.

The mitigation acres have similar habitat characteristics as the locations of the observed eagle nests at Hurricane Lake and Summit Lake. High water levels over the last decade have killed many shore land trees

and reduced eagle nesting habitat. The Northern Wind board has expressed interest in installing an artificial eagle nesting structure along Anderson Lake. Due to the lack of nesting structures in the area and identified regional eagle populations, it is highly likely that the eagle nesting structure will become occupied.

Northern Wind will work with the Service to satisfy the requirements under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. As part of Northern Wind's commitment to responsible development, it will implement the Services' March 23, 2012 Land-Based Wind Energy Guidelines (LBWEGs) in coordination with the Service South Dakota Ecological Services Office, the Services' Mountain-Prairie Regional Office and the South Dakota Game Fish and Parks (SDGFP). As part of Northern Wind's implementation of the LBWEGs, it will develop a Bird and Bat Conservation Strategy (BBCS) in coordination with both the Service and the SDGFP using the standards provided in chapter one of the LBWEGs. See Northern Wind's letter of commitment to the FWS in Appendix C.

2.3 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system. If this alternative is chosen, the Project would not contribute 50 MW of renewable energy to the state's renewable portfolio. Environmental conditions within the Project area, as described in **Section 3.0**, would be expected to persist in their existing state.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the potentially affected existing environment of the Project area. Resource issues or concerns, which may be affected by the construction, operation or maintenance of the Project are further described in this EA. The cumulative impacts to the resources are analyzed in Section 3.15, which discusses the cumulative effect to the environment from the Project.

Other critical elements to the human environment were determined to have no affect from the Project. The following were not considered for further evaluation because either they are not present in the Project area or no measurable impacts would occur.

- Floodplains
- Paleontology
- Wild and Scenic Rivers
- Wilderness
- Recreation

An environmental impact is a change in the status of the existing environment as a result of the Project and can be direct, indirect, short-term, long-term, or permanent. Direct impacts are those that are a result of construction, operation, or maintenance, whereas indirect impacts generally occur following construction and may not be directly related to the Project, but are still reasonably foreseeable. Short-term effects are temporary and the duration is generally associated with construction. Long-term effects remain beyond the duration of short-term impacts but may be recoverable. Permanent effects are the impacts to resources that are not recoverable

3.1 Geology and Soils

The following is a discussion of the geology and soils affected by the Project. Impacts to geology are discussed on a regional scale, while the discussion of impacts to soils is focused on the Project area. Prime farmland soils and soils of statewide importance are also discussed.

3.1.1 Existing Conditions

Northeast South Dakota lies within the Western Lake section of the Central Lowlands physiographic province. Roberts County occupies two physiographic divisions—the Coteau des Prairies and the Minnesota River-Red River lowlands. The Project area is entirely located within the Coteau des Prairies division, a plateau of glacial moraine deposits on top of a bedrock highland between the Minnesota-Red River Lowland and the James River Lowland to the west (Thompson 2001).

The generalized geologic units of the Coteau des Prairies division from oldest to youngest are; Precambrian-age crystalline rocks, Cretaceous-age sedimentary rocks, and Quaternary-age glacial deposits (Thompson 2001). The topography of the region and the Project area was formed by repeated glacial advances and retreats during the Wisconsin Glaciation. Specifically, the glacial deposits within the Project area are classified as end moraine and stagnation moraine till. These deposits are described as having a compact, silty, clay-rich matrix with sand to boulder-sized clasts of glacial origin. The geomorphology of the end moraine is characterized by elevated linear ridges with hummocky terrain locally at former ice sheet margins. The geomorphology of the stagnation moraine is characterized by hummocky terrain with abundant sloughs resulting from stagnation of ice sheets. These glacial deposits are Upper Wisconsin glacial period and may have a composite thickness of up to 300 ft. Beneath the glacial deposits is bedrock composed of Pierre shale. Pierre shale is a highly erodible rock made mostly of clay, including bentonite, with small amounts of sand (Martin et al, 2004).

Sand and gravel is the major nonmetallic mineral commodity produced in South Dakota. Sand and gravel is produced throughout the State and is used mainly for road construction. While Roberts County produces some sand and gravel, the majority of northeastern sand and gravel resources are located to the south in Codington and Brookings Counties. The South Dakota Geological Survey (SDGS) maps, U.S. Geological Survey (USGS) topographic maps, and USDA soils data do not indicate the presence of any sand and gravel deposits within the Project area. Other surficial materials with potential economic uses in construction are also present in the county, including boulders, and clay; however, none have been extracted commercially. No coal or oil and gas production occurs in Roberts County (SDGS 2012).

According to the SDGS, South Dakota is located in an area of very low earthquake probability. There was one 3.7 magnitude earthquake (1995) recorded in Roberts County between the years of 1897 – 2011 (SDGS 2011). This data is supported by USGS seismic hazard maps, which show that the Project area is located in an area with very low seismic risk (USGS 2008). Related geologic hazards, such as soil liquefaction, are therefore also unlikely.

The USDA has mapped 19 soil map units within the Project area (USDA 2013). These soils are primarily well-drained loams and clay loams derived from the underlying glacial till plain deposits. Three soil types comprise 90 percent of the Project area (**Figure 7**). The most extensive of these are Forman-Aastad loams (approximately 48%), Forman-Buse loams (approximately 27%), and Forman-Buse stony complex (approximately 15%). **Table 2** provides a summary of the soil map units within the Project area, including their acreages and percentages of the Project area.

TABLE 2. SOIL MAP UNITS WITHIN THE PROJECT AREA				
MAP UNIT SYMBOL	**MAP UNIT NAME**	**AREA (ACRES)**	**% OF PROJECT AREA**	**FARMLAND CLASSIFICATION**
AaA	Aastad loam, 0 to 2% slopes	50.10	1.92	All areas are prime farmland
BpF	Buse-Forman loams, 20 to 40% slopes	23.20	0.89	Not prime farmland
FoB	Forman-Aastad loams, 2 to 6% slopes	106.15	4.08	All areas are prime farmland
FoC	Forman-Aastad loams, 6 to 9% slopes	579.31	22.25	Farmland of statewide importance
FoD	Forman-Aastad loams, 9 to 15% slopes	579.58	22.26	Farmland of statewide importance
FsB	Forman-Aastad stony complex, 0 to 9% slopes	7.65	0.29	Not prime farmland
FuC	Forman-Buse loams, 6 to 9% slopes, eroded	0.85	0.03	Farmland of statewide importance
FuE	Forman-Buse loams, 15 to 25% slopes	707.47	27.17	Not prime farmland
FvE	Forman-Buse stony complex, 9 to 40% slopes	399.03	15.33	Not prime farmland
HcB	Hamerly-Vallers loams, 2 to 4% slopes	0.26	0.01	Prime farmland if drained
La	LaDelle silt loam	5.92	0.23	All areas are prime farmland
Lt	Lamoure silty clay loam, channeled	9.82	0.38	Not prime farmland
Mr	Southam silty clay loam	80.37	3.09	Not prime farmland
Pa	Parnell silty clay loam	18.29	0.70	Not prime farmland
Ra	Rauville mucky silt loam	3.22	0.12	Not prime farmland
ScF	Sieche loam, 15 to 40% slopes	1.14	0.04	Not prime farmland
Tk	Tonka silt loam	3.59	0.14	Prime farmland if drained
VhA	Vallers-Hamerly loams, 0 to 2% slopes	15.24	0.59	Prime farmland if drained
W	Water	12.45	0.48	Not prime farmland

Source: USDA 2013

Prime Farmland soils and Farmland of Statewide Importance are defined in the USDA- Natural Resource Conservation Service (NRCS) Title 430 National Soil Survey Handbook, issued November 1996, as follows:

"Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. Farmland of Statewide Importance includes those soils in land capability Class II and III that do not meet the criteria as Prime Farmland. These soils are nearly Prime Farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as Prime Farmland if conditions are favorable". (USDA 2013).

Prime Farmland and Farmland of Statewide Importance comprise about half of the soils within the Project area. Approximately 162 acres (6%) of the Project area is classified as Prime Farmland; another 19 acres (0.7%) is considered Prime Farmland if drained, and 1160 acres (44.5%) is considered Farmland of Statewide Importance. Approximately 10 acres (0.4%) of the Project area is covered by soils classified as all hydric. The remaining area is classified as partially hydric soils (i.e., soils containing hydric inclusions). All of the soils in the Project area (with the exception of areas mapped as water) have low to moderate susceptibility to erosion by water (i.e. K-factors <0.4). Most of the soils also have low to moderate susceptibility to wind erosion (i.e., USDA Wind Erosion Groups 6 or greater) (USDA 2013).

3.1.2 Potential Impacts of the Proposed Project

A significant impact to geology and soils would occur if: 1) there is a loss of mineral resources that are not available elsewhere; or 2) significant amounts of prime farmland soils or soils of statewide importance are removed from production; or 3) soil erosion results in irreversible impacts to other resources. Impacts to soils within the Project area will consist primarily of the removal of areas from grazing by occupancy of Project components, including turbines, roads and a substation. In isolated cases, grading may be required for roadway construction. Estimated impacts include up to 21.89 acres of permanent disturbance due to turbine placement, access road construction, and a collection substation. Approximately 2.5 acres of prime farmland soils and 15 acres of soils of statewide importance would be permanently impacted by the Project. Only one turbine will be located on prime farmland soils. Roberts County has a total of 353,271 acres of prime farmland soils and 88,705 acres of soils of statewide importance, so permanent impacts from the Project to these soils are not significant. Because of the gentle relief in the Project area and the deliberate siting of facilities on level terrain, the potential for soil loss due to erosion would be low. Impacts to hydric soils, such as compaction, are expected to be minimal due to micrositing to avoid wetlands, which are commonly associated with hydric soils.

Since the Project proposes to impact prime and statewide important farmland, the NRCS Huron South Dakota field office requested that a USDA Farmland Conversion Impact Rating Form (AD-1006) be completed for this Project. The Total Points in Part VII of the form was calculated to be 122. This is below the 160 point

threshold and therefore, the proposed activity will have no significant impact on the prime and statewide important farmland in Roberts County.

The Project includes restoration of disturbed areas to pre-construction conditions. Soil erosion, compaction, and other related disturbance would be short-term, and would be minimized by implementing environmental protection measures. With the proper implementation of environmental protection measures intended to prevent, minimize, and/or reclaim soil erosion, compaction, and spill effects, no unmitigated loss of highly productive soil would result from implementation of the Project.

Impacts of the proposed Project to available mineral resources are very low. No sand and gravel resources have been identified in the Project area. No geologic hazards are likely to impact the Project. Impacts to geology and soils are therefore not anticipated to be significant.

3.2 Air Resources

The South Dakota Department of Environment and Natural Resources (SDDENR) regulates air quality in South Dakota along with the U.S. Environmental Protection Agency (EPA) through implementation of the Federal Clean Air Act (CAA) (42 U.S.C. §§ 7401-7671q). The federal CAA requires all states to control air pollution emission sources so that National Ambient Air Quality Standards (NAAQS) are met and maintained (EPA 2009).

The NAAQS, established by the EPA, represent the maximum allowable atmospheric concentrations that may occur without jeopardizing public health and welfare. These concentrations generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. NAAQS have been set for the following criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), nitrogen dioxide (NO_2), respirable particulate matter less than 10 microns (PM10) and less than 2.5 microns (PM2.5), and lead (Pb).

An area that does not meet the NAAQS is designated as a nonattainment area on a pollutant-by-pollutant basis. Attainment is achieved if the NAAQS thresholds have not been exceeded for any criteria pollutant in an area (EPA 2009).

3.2.1 Existing Conditions

South Dakota is in attainment of all state and federal air quality standards (SDDENR 2012). The site is located in a rural setting with minimal industrial sources or vehicular traffic. Present air quality trends in the area have minimal impacts and are affected primarily by fugitive dust from agricultural operations, as well as emissions from agricultural equipment, vehicles and traffic. The Project would have an effect on air quality

during the construction phase, primarily from fugitive dust and the exhaust of equipment and transportation of employees and materials to and from the site. These would be one-time emissions, which would cease when the construction phase is completed.

Most of the electricity produced in South Dakota is produced by hydroelectric and coal-fired power plants (EIA 2012). Hydroelectric power typically supplies about one-half of the electricity consumed in the state. New sources of hydroelectric power are not expected to be part of the overall energy production portfolio. Approximately 40 percent of the energy in South Dakota is supplied by coal, which is a large contributor to hazardous air toxics (Clean Air Task Force 2002), and toxic mercury pollution (EPA 2000). In addition, a large portion of sulfur dioxide and nitrogen oxides pollution in the U.S comes from coal-fired power plants (EPA 2003).

Recent industrialization and burning of fossil carbon sources, especially coal, have caused carbon dioxide (CO_2) concentrations to increase dramatically, and are likely to contribute to overall global climatic changes (EPA 2000). The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal and most of the observed increase in globally average temperatures is very likely due to the observed increase in anthropogenic greenhouse gas concentrations (IPCC 2007). As more greenhouse gases are emitted into the atmosphere, impacts to climate change will continue to increase.

3.2.2 Potential Impacts of the Proposed Project

A significant impact to air quality would occur if there was a violation of Federal or State air quality standards. Emissions from vehicles and heavy equipment during construction would result in temporary and localized air quality impacts. These activities will generate fugitive dust and emissions that include CO, NO_X, SO_2, and hydrocarbons.

Air quality effects caused by dust and vehicle emissions would be short-term and would not exceed the NAAQS particulate standards. Because operation and maintenance activities would be similar to existing conditions, Project greenhouse gas emissions would not represent a substantial change. Environmental protection measures would reduce potential impacts on air quality so that federal and state standards would not be exceeded. Environmental protection measures are provided in Section 2.2.6.

It is estimated that the Project will produce 197,100 MWh of emission-free energy annually, assuming 45% Net Capacity Factor. The average output emission rates for power generators in South Dakota are: 1,181.45 lbs./MWh of CO_2; 13.96 lbs./GWh of methane (CH_4); and 19.03 lbs./GWh of nitrous oxide (N_2O) (EPA 2008). Based on this data and assuming the Project is operated at full name plate capacity of 50 MW annually, the Project would replace emissions by other electrical grid power generation by 105,625 metric tons of CO_2, 1.25

metric tons of CH_4, and 1.7 metric tons of N_2O. The operation of the Project will have a positive impact on air quality.

The Project would reduce greenhouse gas emissions through the long-term generation of renewable electricity, which would provide a potential net benefit to regional air quality.

3.3 Water Resources

This document and assessment focused on the water resources within the Project area, but some discussion of regional resources is necessary for context of site-specific water resources. The following discussion of water resources includes descriptions of the surface water, wetlands, and groundwater found within the Project area.

3.3.1 Existing Conditions

Surface Water

Surface water resources were identified for the Project area using Federal Emergency Management Act (FEMA) Flood Insurance Rate Maps (FIRM), USGS topographic maps, National Land Cover Dataset (NLCD), Service National Wetlands Inventory (NWI) data, and the National Hydrography Dataset (NHD). The Project is located along the eastern edge of the Coteau des Prairies physiographic division with the majority of the Project within the Prairie Coteau Escarpment ecoregion and the southwest portion of the Project within the Prairie Coteau ecoregion. The glaciated topography of this region is dominated by a hilly, undulating landscape with comparatively high elevation and numerous wetlands. Many potholes and closed depressions occur that are often connected by swales. Overland surface flow from precipitation recharges the potholes and depressions in the Project area. The total acres of open water fluctuate with annual precipitation. This region is in the Humid Continental climate zone with a mean annual rainfall of about 20.9 inches per year. According to NLCD data, open water accounts for 61 acres, whereas the NWI classifies 20.6 acres as Freshwater Pond. None of the surface waters are listed as state impaired waters. Many of the potholes and depressions have been dyked to impound water for livestock watering.

The Project is within the Upper North Fork Whetstone River and the Jorgenson River subwatersheds of the Minnesota River Watershed. The Upper North Fork Whetstone River has a drainage basin of 86,000 acres and the Jorgenson River has a drainage basin of 88,000 acres (Thompson, 2001). Drainage patterns within the western portions of the watersheds are well defined with intermittent and perennial streams flowing off the escarpment to the Minnesota River valley 300 to 600 feet below. No perennial streams occur within the Project area but a few intermittent streams are present and can be identified by the deciduous forests that occur along their banks. An unnamed intermittent stream is located in the central and northeast portions of the Project area and drains eastward to a large wetland complex within the Minnesota River valley just west of Big Stone Lake. An unnamed intermittent tributary of the North Fork Whetstone River is located in the southeast portion of the Project area and drains southeastward to the Minnesota River. These tributaries are

waters of the United States by the U. S. Army Corps of Engineers (USACE) and EPA definitions. There are no major rivers or traditional navigable waters found within the Project area. No FEMA floodways were identified within the Project area.

Wetlands

Wetland resources were identified for the Project using USGS topographic maps, Service NWI data, Service wetland easements, USDA soil Survey, NHD and on-site wetland delineation. The Project is located within the Midwest Region (Land Resource Region M) and more specifically the Rolling Till Prairie (Major Land Resource Area 102A). Most of the remaining wetlands in the Midwest Region that are not in agricultural use can be classified generally as prairie wetlands, riverine wetlands, and eastern forested wetlands. Wetlands within the Project are classified as prairie wetlands. Examples of prairie wetlands include seasonally flooded basins, wet prairies, sedge meadows, shallow and deep marshes, and open water systems (USDA 2006). This area of the U.S. is also known as the Prairie Pothole Region which produces over half of the continent's waterfowl and also provides the most productive breeding habitat in North America for hundreds of other migratory bird species. Waters of the U.S., as defined by Section 404 of the Clean Water Act (1973), are within the jurisdiction of the USACE. Jurisdictional waters within the Project area are regulated by the USACE-St. Paul District. Waters of the U.S. include both wetlands and non-wetlands that meet USACE criteria.

Initially, desktop wetland analysis methods were used to identify wetlands and waterbodies within the Project area. The desktop wetland analysis identified 110 acres (4.4%) of the Project area classified as NWI wetlands and 116 acres of Service wetland easement basins. (**Figure 8**). The entire Project area contains Service wetland easement. Service wetland easements are only applicable to the specific wetlands contained within the easement areas and do not cover the entire property on which they are recorded. In many locations, the NWI wetlands and Service wetland easements overlap.

On-site wetland delineation was completed for the Project in November 2011 and May 2012 (WCEC 2012). Wetlands present within the Project Area of Potential Effects (APE) were identified and delineated using the procedures described in the USACE Manual for Identifying and Delineating Wetlands, 1987 edition, and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE 2010). The following APE was surveyed to determine potential impacts:

- Turbine Pads - 200 foot radius.
- Collection lines - 200 foot buffer from centerline.
- Access roads - 200 foot buffer from centerline.
- Crane Path- 200 foot buffer from centerline.
- Substation – 1.5 acres.
- Laydown Areas – 4 acres.

The wetland delineation identified 21 wetlands within the APE. All 21 wetlands identified are consistent with the definition of isolated waters and therefore would not be subject to the Clean Water Act; however, the

Service recommends avoidance/minimization/compensation of impacts to these areas regardless of USACOE jurisdiction. The extent of wetlands potentially subjected to federal regulation was determined by applying the USACE Jurisdictional Determination Form Instruction Guidebook, including the December 2, 2008; USACE/EPA revised Rapanos guidance (USACE/EPA 2008). Official determinations of jurisdictional features can only be made by the USACE and EPA.

Groundwater

Groundwater resources in Roberts County are scarce and often of limited extent and provide water of poor quality (Gilbertson 1996). Groundwater resources are available from both surficial and bedrock aquifers. Surficial aquifers derived from water saturated glacial outwash deposits are found in northern and eastern Robert s County (Veblen Aquifer) and in southwestern Roberts County (Coteau Lakes Aquifer). The Dakota bedrock aquifer underlies all of Roberts County (Hedges et al., 1982). The surficial aquifers are more widely utilized since they provide higher yields and better quality water than the Dakota aquifer. A search of the South Dakota water well completion reports did not identify any wells within the Project.

3.3.2 Potential Impacts of the Proposed Project

A significant impact to water resources would occur if: 1) the Project causes a loss or degradation of wetlands; 2) the Project causes an increase in susceptibility to on-site or off-site flooding due to altered surface hydrology; 3) the Project causes a violation of the terms and conditions of a SDDENR storm water permit; or 4) the Project causes a loss or degradation of surface water or ground water quality.

Northern Wind has committed to no permanent wetland impacts. Of the 21 wetlands identified within the area of investigation, only 1 contained project infrastructure within the wetland boundary in the original project layout. Wetland W1 is crossed by the access road to turbine G5 and a collector line. The access road and collector line will follow an existing field access road that crosses W1 in this location and will not create any additional impacts. All other project components were microsited to avoid wetlands resulting in no permanent or temporary wetland impacts.

On-site or off-site flooding would not result from the construction and grading of roads and other facilities related to the Project. Implementation of environmental protection measures such as installation of adequately sized and appropriately placed culverts and avoidance of intermittent streams and other areas of concentrated flow, will ensure that flooding does not occur.

A storm water runoff permit will be obtained from SDDENR prior to construction. Compliance with this permit and the associated storm water pollution prevention plan would ensure that surface water is not adversely affected by runoff from disturbances and construction areas.

As with any construction activity, there is a possibility of spilling fuel, hydraulic fluid, or other hazardous substances. The potential of such events would be minimized through implementation of the environmental protection measures described in Section 2.2.6. Construction equipment would be equipped with spill

cleanup kits. Equipment refueling would take place at secure areas, away from wetlands or drainages. These measures would ensure that surface and ground water quality is not degraded through spillage of contaminants.

Impacts to groundwater resources as a result of the Project are not anticipated. Withdrawals of groundwater will not be necessary due to the limited water supply needs of the Project. Project components will not be constructed in groundwater recharge areas.

No significant impacts to water resources are anticipated from the Project.

3.4 Vegetation

Vegetation for the Project area was determined using aerial photography, a review of existing data, and field reconnaissance trips to confirm and ground-truth vegetation types. The study area for vegetation is the Project area boundary.

3.4.1 Existing Conditions

The Project area is located in the Prairie Coteau Escarpment and the Prairie Coteau ecoregions of the Northern Glaciated Plains ecoregion (USGS 2006). The Prairie Coteau Escarpment rises 300 to 600 feet above the Minnesota River Valley to adjoin the Prairie Coteau, and is characterized by dissected topography along the face of the escarpment, incised by high gradient perennial streams. The streams that flow off the escarpment provide habitats and oxygenated water unique to this area of South Dakota. The ecoregion supports deciduous woodland forests in the riparian areas, interspersed by tallgrass prairie. The steep areas of the escarpment remain in woodland cover with grasslands and are used for pasture. The flatter areas dominated by grasses are tilled for row crops or used as pasture.

The Prairie Coteau ecoregion is characterized by an undulating, hummocky, rolling terrain that rises above the surrounding drift plains and has no drainage pattern. The Coteau has a high concentration of wetlands and also contains a chain of large lakes. The level of precipitation of the ecoregion allows for deciduous woodlands near wetland margins. The natural vegetation of the ecoregion consists of mostly tall grass prairie. The rolling, hilly areas are used as pasture, while the flatter areas are tilled for row crops.

The land in the Project area consists of native prairie (69.8 percent), historically tilled grassland (16.2 percent), deciduous trees (6.6 percent), and tame grassland (7.5 percent) (**Figure 9**).

In a letter dated October 24, 2011 the Service identified the Western prairie fringed orchid (*Platanthera praeclara*) as the only plant species designated by the Endangered Species Act (ESA) that had the potential to occur in the vicinity of the Project. The western prairie fringed orchid became listed as a threatened species

on September 28, 1989. The Western prairie fringed orchid is a terrestrial member of the orchid family (*Orchidaceae*) that grows up to a height of 4 feet. Its appearance is described as a relatively tall spike-like stalk that bears up to 24 showy, wide, white flowers. The western prairie fringed orchid has experienced at least a 60 percent decline from historic levels. The preferred habitat is intact native prairie, but the plant has also been found in roadside ditches and old plowed fields. It is found most often in mesic to wet unplowed tallgrass prairies and sedge meadows (USFWS 1996). Presently, populations are known from 175 sites in six States and Canada. No western prairie fringed orchids are known to be located within the general vicinity of the proposed project and there are no known occurrences of the western prairie fringed orchid in South Dakota (USFWS 2004). Approximately 90 percent of the known population is located in the Red River Valley of North Dakota and Minnesota (USFWS 1996 and 2009, NatureServe 2013).

Site specific plant surveys were conducted by West Central Environmental Consultants, Inc. (WCEC) during site wetland delineations and prior to the Dakota skipper survey. Aerial percent of all plant species occurring within a 50 foot radius were documented at 46 locations. The sampling locations were completed within known areas of the Project footprint (turbine locations, access roads, substation location, etc.). Based on vegetative conditions and native plant species, high ranking native prairie was identified and mapped. These areas would be the most likely to support populations of western prairie fringed orchid if present. The site plant surveys did not identify any occurrences of western prairie fringed orchids. No direct impacts due to the project are anticipated to the western prairie fringed orchid.

Native Prairie

The Native Prairie in the Project area consists of a tallgrass prairie. Tallgrass prairies are the wettest prairie ecosystem in South Dakota and are dominated by species that include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), and purple coneflower (*Echinacea angustifolia*). The tallgrass prairie region once covered almost 200 million acres, but today, less than 4 percent of the original tallgrass prairie remains. The tallgrass prairie region has become one of North America's most endangered ecosystems (Service 2000).

A field survey of the Project area was conducted on June 6-7, 2012 to determine the extent of native prairie. A total of 1,894 acres (69.8 percent) was identified as native prairie (**Figure 9**). Nearly all of the native prairie within the Project area is used as pastureland and is moderately to lightly grazed by cattle. Because of the use of native prairie as pastureland, the prairie is a mixture of remnant prairie plants and non-native plants. The diversity of plants is less in prairie used as pastureland than in remnant native prairie as some species of plants do better than others in disturbed soils and grazed lands. For example, wolfberry (*Symphoricarpos occidentalis*) is avoided by cattle and therefore was identified in fairly high densities in the Project area. Some non-native species and noxious weeds can out-compete native species in disturbed soils and were also identified throughout the Project area. Some of these non-native plants included smooth brome (*Bromis inermis*), yellow sweetclover (*Melilotus officinalis*), and Canada thistle (*Cirsium arvense*). The highest quality

of native prairie was identified in the northern portion of the Project area. These areas typically had a high diversity of native species that are characteristic of remnant prairie and include big and little bluestem, Indiangrass, pale purple coneflower, lead plant (*Amorpha canescens*), hoary puccoon (*Lithospermum canescens*), and prairie alumroot (*Heuchera richardsonii*).

Historically Tilled Grassland

The Project area contains 420 acres of historically tilled land. These areas were identified by the ranch owner and are located in the flatter areas throughout the Project area (**Figure 9**). Because the tilled land has not been planted recently and is currently used as pastureland, many native species from the adjacent tallgrass prairie have encroached. Therefore, these sites contain native plants of tallgrass prairies intermixed with plants that were grown for livestock forage. The most distinguishing feature that defines these sites from the native prairie is the presence of rowed crops such as alfalfa (*Medicago sativa*).

Deciduous Trees

The Project area contains 172 acres of deciduous woodland comprised mainly of bur oak (*Quercus macrocarpa*) and green ash (*Fraxinus pennsylvanica*). These trees are located primarily along drainages, large wetlands, in groves at the old farm sites, and in small stands scattered throughout the Project area (**Figure 9**). The largest stands of deciduous trees are located along the perennial streams flowing off of the escarpment.

Tame Grassland

Tame grasslands differ from native prairie in that tame grasslands occur on tilled soil and have been planted, whereas native prairie is found on unbroken soil. The tame grasslands associated with CRP lands, are primarily located in the southern portion of the Project area and are dominated by smooth brome, Kentucky bluegrass and switchgrass. Tame grasslands were identified on 194 acres of the Project area (**Figure 9**).

3.4.2 Noxious and Invasive Weeds

Noxious weeds are defined by South Dakota as "a weed which the commission has designated as sufficiently detrimental to the state to warrant enforcement of control measures" (South Dakota Code 2006). In addition, South Dakota describes a noxious weed as possessing the following characteristics:

- The weed is a perennial;
- The weed is capable of unique and rapid spreading and growth under adverse conditions;
- The weed is not controllable without special preventive chemical, mechanical, biological, and cultural practices;
- The weed is capable of materially reducing the production of crops or livestock;
- The weed is capable of decreasing the value of the land; and
- The weed is not native to the state.

South Dakota has listed seven species as State Noxious Weeds (SDDA 2009). During the 2012 native prairie survey, two species listed as State Noxious Weeds were identified in the Project area: Canada thistle and leafy spurge (*Euphorbia esula*). In addition, South Dakota allows individual counties to list species as Local Noxious Weeds. Roberts County has not listed any species as a Local Noxious Weed (SDDA 2009).

3.4.3 Potential Impacts of the Proposed Project

A significant impact to vegetation resources would occur if the Project causes habitat alteration resulting in the listing or jeopardizing of a plant species or other wildlife species, or the introduction of noxious weeds to areas presently void of noxious weeds.

No Western prairie fringed orchids were observed during the site plant surveys with the Project footprint. Since the orchids are not likely present in the Project area and have not recently been observed in the state of South Dakota, a significant impact is not likely to occur. The site plant surveys did not identify any occurrences of western prairie fringed orchids.

The Project would result in both permanent and temporary impacts on vegetation. The operational footprint would impact a total of 22.43 acres of permanent disturbance (**Table 3**). The temporary impacts, associated with the construction of the Project, would result in 12.07 acres of disturbance to vegetation.

TABLE 3. ESTIMATED PERMANENT AND TEMPORARY IMPACTS TO VEGETATION COVER

COVER TYPE	PERMANENT IMPACTS (ACRES)	TEMPORARY IMPACTS (ACRES)
Native Prairie	11.02	5.16
Historically Tilled	8.05	2.09
Deciduous Trees	0	0.02
Tame Grasslands	3.36	4.80
Total	22.43	12.07

The activities associated with construction may disturb soils and vegetation to an extent that may require seeding with native vegetation as well as contouring the landscape to its original form. It is also possible that construction activities may not impact the vegetation. In which case, the vegetation would naturally regenerate. During the operation phase of the Project, routes necessary to maintain access to the site would remain cleared of vegetation, and some coarse surface material may be left in place to ensure access is possible during adverse weather conditions.

The permanent vegetation loss has been minimized to the extent practicable in design of the Project and is relatively small (<1 percent) when compared to the Project area. In addition, turbine location changes have occurred in order to reduce impacts to high quality vegetation types. The native prairie survey identified high quality remnant native prairie in the northern portion of the Project area. As a result of this finding, Northern Wind relocated two turbines from the high quality native prairie to areas of lower quality prairie. Crane paths utilize current and planned access roads to minimize temporary disturbance, and current roads and road right of ways are followed by collection lines to minimize impacts to vegetation.

In addition, as a mitigation measure for the impacts to native prairie and Service grassland easements, Northern Wind intends to enroll 240 acres of land in Service grassland easements. The mitigation acreage is greater than a 20:1 ratio of mitigation land to permanent impacts to native prairie. See section 2.27 for details on the mitigation acres.

The spread of noxious weeds is a potential impact of the Project. Sources for weed seeds exist within and around the Project site, and equipment can serve as a vector for spread. Noxious weeds have the greatest opportunity to spread in disturbed soils within the Project area such as roadways and turbine pads. Noxious weeds have the ability to displace native vegetation and hinder reclamation efforts, thus reducing the habitat quality and lengthening the duration of the impact. Weed mitigation applied to the construction and reclamation would minimize the impacts of noxious weeds. A weed/invasive species management plan to prevent the spread of noxious weeds during the construction and operation of the Project in accordance with state and local regulations is included in section 2.2.8. The A weed/invasive species management plan will be designed to not negatively affect insects or beneficial native plants.

3.5 Wildlife

This section discusses the wildlife resources that may be present within the Project and the surrounding local area. The surrounding local area is included in this discussion because of the wide range and distribution of habitat for some species, such as birds and large mammals. Information regarding wildlife resources was obtained from literature review and site specific surveys.

3.5.1 Existing Wildlife Species

In general the wildlife species present within the study area are typical of agricultural landscapes, pasture grasslands, and wetland habitats in the region. The Project area is mostly located in the Prairie Coteau Escarpment Ecoregion and partly within the Prairie Coteau Ecoregion. The species of greatest concern for this document were based on federal or state protected species, species of greatest conservation need, and those species that are commonly identified in association with wind energy projects throughout the country. No incidental wildlife observations were reported during the field surveys.

Two species of primary interest in the region of the Project are whooping crane (*Grus americana*) and Topeka shiner (*Notropis topeka)*. The eastern most portion of the migration corridor for the whooping crane is approximately 75 miles west of the Project area (Service 2009). The known range for the Topeka shiner is located to the south along the tributaries of the James River, Big Sioux River and Vermillion River in the southern and eastern part of the state. Its northernmost range is located approximately 30 miles from the Project area (Service, September 2011a). Therefore the Project will not adversely affect the whooping crane or the Topeka shiner and will not be reviewed in detail in this document.

Avian Species

Avian use surveys were conducted in the fall 2011 (Chodachek and Bay 2012a), spring 2012, and summer 2012 (Chodachek and Bay 2012b). The fall and spring studies were fixed point surveys and included six point count locations while the summer breeding bird survey was a transect survey and included eight transects (**Figure 10**). During the fall surveys, each location was surveyed during 10 events for a total count of the Project area of 60 times. During the spring survey, each location was surveyed eight times for a total of 48 counts for the Project area. Two viewsheds were used during the fixed point surveys: 800 m for large birds and 100 m for small birds. The summer transect locations were surveyed on three occasions for a total transect count of the Project area of 24 times. During the transect surveys, all birds seen or heard within 50 m of either side of the transect line were recorded. Waterfowl use was highest in the fall, while raptor use was highest in the spring.

Fall Survey

Twenty-two unique bird species were observed during the fall survey and 1,274 individual birds were observed within 147 groups (Chodachek and Bay 2012a). Waterfowl was the most abundant of all large bird types, followed by doves/pigeons, raptors, and corvids. The most commonly observed passerine species was the European starling (*Sturnus vulgaris*). Two species composed 53.3 percent of the observations: Canada goose (*Branta canadensis*) and European starling. The most common raptor was red-tailed hawk (*Buteo jamaicensis*). No active nests were reported. The state-listed threatened bald eagle (*Haliaeetus leucocephalus*) was recorded during the fall bird use surveys on three separate occasions; however this may represent repeated observations of the same individual (Chodachek and Bay 2012a). Bald eagles are discussed in more detail in section 3.5.2.

For all large bird species, use was highest at survey point 2 (**Figure 10**), primarily due to large use by waterfowl. Raptors were observed at all points, but point 4 had the highest use at 0.6 birds/20-minute survey. Passerines were observed at all points, with the highest use occurring at point 1 (7.7 birds/20-minute survey) and lowest at point 5 (1.20 birds/20-minute survey).

Bird types most often observed flying within the rotor swept height (RSH) were vultures (75%; based on 4 observations), raptors (45%) and waterfowl (39.1%). Passerines and small birds were observed flying below the zone of risk 96.5% of the observations (Chodachek and Bay 2012a).

Spring Survey

Thirty-four unique bird species were observed during the spring survey and 761 individual birds were observed within 232 groups (Chodachek and Bay 2012b). Three species composed 52 percent of all observations: Canada goose (*Branta canadensis*), western meadowlark (*Sturnella neglecta*), and red-winged blackbird (*Agelaius phoeniceus*). Waterfowl was the most abundant of all large bird types and the majority of waterfowl observations were Canada goose. The most commonly observed passerine species was the red-winged blackbird and the most common raptor was red-tailed hawk (*Buteo jamaicensis*). No active nests were reported. No bald eagles were observed during the spring or summer surveys.

For all large bird species, use was highest at survey points one, two, three, and five primarily due to large use by waterfowl. Raptors were observed at all points, but point three and five had the highest use at 1.12 birds/20-minute survey. Passerines were observed at all points, with relatively high occurrence (9.75 – 11.75) birds/20-minute survey) with the exception of point 3 (4.75 birds/20-minute survey).

Of the large bird types that were observed flying, 19% were recorded flying at RSH. Bird types most often observed flying within the turbine zone of risk were raptors (44.4%) and waterfowl (39.1%). Gulls, vultures, and large corvids were also recorded flying within the RSH, but a small number of observations of these species were reported. Passerines and small birds were observed flying below the zone of risk 96.5% of the observations (Chodachek and Bay 2012b).

The greater prairie-chicken (*Tympanuchus cupido*) and the trumpeter swan (*Cygnus buccinator*) were encountered during the spring survey. Both of these species are designated by the state of South Dakota as Species of Greatest Conservation Need (SDGFP 2012). No greater prairie-chicken leks were identified in the Project area. This designation does not carry any regulatory authority.

Summer Breeding Bird Surveys

Thirty-two unique bird species were observed during the summer survey and 612 individual birds were observed within 193 groups (Chodachek and Bay 2012b). Five species composed 59.8 percent of all observations: Canada goose, western meadowlark, chipping sparrow (*Spizella passerine),* bobolink (*Dolichonyx oryzivorus)* and barn swallow (*Hirundo rustica*). Waterfowl was the most abundant of all large bird types and the majority of waterfowl observations were Canada goose. The most abundant passerine species was the bobolink. Only one diurnal raptor was recorded and the species was unidentified. No active nests were reported. No bald eagles were observed during the spring or summer surveys

Passerines were the most encountered bird type during the surveys. For all bird species combined, use was highest at transect location G8 (**Figure 10**). Passerines were observed at all points, with relatively high occurrence. For large bird types, waterbirds were common at transect G17 and waterfowl were common at Transect G7.

Three species that are designated by the state of South Dakota as Species of Greatest Conservation Need (SDGFP 2012) were encountered during the summer breeding bird survey. These species are the American white pelican (*Pelecanus erythrorhynchos*), black tern (*Chlidonias niger*), and the greater prairie-chicken. The designation of Species of Greatest Conservation Need does not carry any regulatory authority.

When compared to other wind facilities with similar protocols, the mean diurnal raptor use for the Project area is considered low in the fall and Low to Moderate in the spring. Fall raptor use ranked 30th compared to the 42 other wind energy facilities and spring raptor used ranked 20th of 52 wind energy facilities (Chodachek and Bay 2012).

3.5.2 Sensitive Wildlife Species

The Service administers the ESA, which mandates 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 will require consultation with Service and may require the issuance of an incidental take permit or mitigation measures to avoid or reduce impacts to these species.

Candidate species receive no statutory protection from the Service; however, they do receive full protection once listed. In addition, federal action agencies may elect to treat candidate species as listed. Candidate species are those for which Service has sufficient information to list as threatened or endangered. Candidate species receive no legal protection under the ESA. There are no legal prohibitions under the ESA against taking candidate species. To determine the order in which it proposes species for listing, the Service assigns listing priority numbers to candidate species based on the magnitude and immediacy of threats and the species' taxonomic distinctiveness. Listing priority numbers range from 1 (high priority) to 12 (low priority). The Service works to implement conservation actions for candidate species that may eliminate the need to list the species as threatened or endangered. (Service, October 2011b)

In a letter dated October 24, 2011 the Service identified the Dakota skipper (*Hesperia dacotae*) as the only wildlife species designated by the ESA that had the potential to occur in the vicinity of the Project. The list provided by the FWS is valid for 90 days. Natalie Gates of the FWS Ecological Services South Dakota Field Office approved updating the species list based on the FWS - Environmental Conservation Online System (ECOS) (Natalie Gates, personal communication, November 25, 2013).

The ECOS website list of Threatened, Endangered, and Candidate Species for Roberts County accessed on June 30, 2014 identified the following species that may occur in the vicinity of the Project (Service 2014):

Dakota Skipper (Hesperia dacotae)	Proposed Threatened
Poweshiek Skipperling (Oarisma poweshiek)	Proposed Endangered
Northern Long-Eared Bat (Myotis septentrionalis)	Proposed Endangered
Red Knot (Calidris canutus rufa)	Proposed Threatened

Western consulted with the Service under Section 7 of the ESA by completing a Biological Assessment (BA) of the Project, submitted December 13, 2013. Western determined that the Project is not likely to adversely affect the western prairie fringed orchid and not likely to jeopardize the continued existence of the proposed species. In the Service BA response letter dated February 3, 2013, the Service concurred with the conclusions of the BA (**Appendix D**). However, the Service noted that the Dakota skipper appeared vulnerable to adverse impacts related to construction of the Project and that construction of the project was proposed to occur after the listing decision of the proposed species. The Service published a final rule listing the Dakota skipper as a threatened species and Poweshiek skipperling as an endangered species on October 24, 2014. Consequently, Western requested formal consultation on the Project on October 31, 2014 with a determination of may affect, likely to adversely affect the Dakota skipper.

Dakota Skipper

The Dakota Skipper was federally listed as a threatened species under the ESA on October 24, 2014 (Service 2014b). The Dakota skipper is a small butterfly with a 1-inch wingspan, a thick body and is faster and more powerful in flight than most butterflies. The most significant remaining populations occur in western Minnesota, northeastern South Dakota, North Dakota, and Manitoba. Although it likely occurred throughout a relatively unbroken and vast area of grassland, it now occurs only in scattered remnants of high-quality native prairie. Populations have declined historically due to widespread conversion of native prairie for agriculture and other uses, leaving populations isolated from one another in relatively small areas of remnant native prairie. Its current distribution straddles the border between tallgrass and mixed-grass prairie ecoregions, but 85%-99% of their historical tallgrass prairie and 72%-99.9% of their historical mixed-grass prairie has been lost (Service, October 2011c).

Dakota skippers occur in two types of habitat: (1) relatively flat and moist native bluestem prairie and (2) upland prairie that is often on ridges and hillsides with vegetation that is dominated by bluestem grasses and needle grasses. Three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple coneflower (*Echinacea pallida*), upright coneflower, (*Echinacea angustifolia*) and blanketflower (*Gaillardia aristata*).

Dakota Skipper Critical Habitat: The Service is proposing to designate 54 tracts, ranging in size from 31 acres to 2,887 acres, in North Dakota, South Dakota and Minnesota as critical habitat for the Dakota skipper. Critical habitat was identified within the Project area in T. 123N, R51W, Section 9 (Service 2013c). No turbines or project infrastructure is located within the area designated as critical habitat.

Dakota skipper surveys were conducted on June 24-28, 2012 in the Project area. An additional survey was completed during the 2014 flight period on July 19, 2014 to survey additional lease lands and verify areas resulting from turbine micrositing. The surveys took place during the adult flight period and on days when there was a high probability of observing flying adults. The survey points were located at all proposed turbine locations except those located on lands enrolled in the CRP, which do not support skipper habitat. Surveys were also conducted along the proposed roadways.

Nine Dakota skippers were identified at two locations. Eight of the sightings were located in the northern section of the Project area in T. 123 N., R. 51 W., Section 9. This pasture has the highest quality habitat identified for skippers in the Project area and is within the Service proposed critical habitat. Two turbines had been proposed in this area, and have been relocated due to the quality of native prairie and skipper habitat. One skipper was identified in the south central portion of the Project area in T. 123 N., R. 51 W., Section 27. One turbine had been proposed to be located in this habitat, but Northern Wind relocated it based on habitat quality. Dakota skippers were not observed at any other locations in the Project area. Suitable skipper habitat was identified at various locations throughout the site, but mainly in the sections where skippers were identified. All other locations were determined not to have suitable habitat for Dakota skippers.

Powesheik Skipperling

The Poweshiek skipperling was federally listed as an endangered species under the ESA on October 24, 2014 (Service 2014b). Poweshiek skipperlings are small, moth-like butterflies, and have a single flight period per year, occurring from about the middle of June through the end of July. Poweshiek skipperlings require relatively pristine native tallgrass prairie habitat for their survival, but the full range of habitat preferences for this species includes fens, grassy lake and stream margins, moist meadows, and wet-mesic to dry tallgrass prairie. Preferred nectar plants vary across the range, and include yellow ox-eye (*Heliopsis helianthoides*),

purple coneflower, tickseed (*Coreopsis palmata*), black-eyed susan (*Rudbeckia hirta*), and pale-spike lobelia (*Lobelia spicata*). On drier prairie habitats purple coneflower is used almost exclusively.

The historical range of the Poweshiek skipperling is concentrated in the tallgrass prairie portions of northern Iowa, western Minnesota, and eastern North and South Dakota, and extends eastward to portions of Illinois, Indiana, Michigan and Wisconsin, and into southern Manitoba. South Dakota has the second highest concentration in the current range. Habitat loss and fragmentation have been the greatest historical factors contributing to the decline of the Poweshiek skipperling. Recent surveys in South Dakota have documented population declines similar to those observed elsewhere. Overall tallgrass prairie losses across the range of the Poweshiek skipperling are almost 99.9%. They do not have the capability to survive in the surrounding altered landscape and have low dispersal capability (Selby, 2005).

Powesheik skipperling surveys were conducted in conjunction with the Dakota skipper surveys, which took place June 24-28, 2012 in the Project area. The surveys were conducted at the proposed turbine locations and the proposed locations of roadways. No Powesheik skipperlings were observed during the surveys. No Powesheik skipperlings have been observed in South Dakota since 2008.

Northern Long-Eared Bat and Other Bat Species

The northern long-eared bat was proposed to be federally listed as an endangered species under the ESA on October 2, 2013. Critical habitat for this species is also proposed but is not determinable at this time (Service 2013d).

Twelve species of bats regularly occur in South Dakota and one species, tri-colored bat (*Perimyotis subflavus*), has been identified on few occasions (SDBWG 2004). Of these 13 species, six species are likely residents or migrants in the Project area, including big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis),* hoary bat (*Lasiurus cinereus*), little brown bat (*Myotis lucifugus*), silver-haired bat (*Lasionycteris noctivagans*), and northern long-eared bat (Chodachek and Murray 2013). Of the bats with potential to occur in the Project area, only the northern long-eared bat is proposed to be federally listed as an endangered species under the ESA.

A bat habitat characterization study was conducted in October 2011. Potential roosting habitat in the Project area is limited to buildings and wooded areas. There are no known Karst formations in Roberts County. Because of the limited roosting habitat, the Project area will likely have low use rates by resident bats in the summer, but will receive some use as stopover habitat by migrating bats in the spring and fall (Chodachek and Derby 2011).

A bat acoustic survey was conducted from April 2012 to October 2012 (Chodachek and Murray 2013) in the Project area to determine the levels of bat activity throughout the seasons. Two AnaBat^{TM} SD2 detectors were used at one permanent location and at two temporary ground locations that were rotated weekly

(**Figure 10**). The survey was divided into spring, summer, and fall seasons. Mean bat activity was also calculated for a fall migration period of July 31 through October 14.

Two AnaBat detectors operated a total of 254 detector nights at three locations from April 17 to October 1, 2012. The average overall bat activity for all stations was 8.28 ± 0.76 bat passes/detector night. During the fall migration period only, the average bat activity for all stations was 6.07 ± 0.99 bat passes/detector night. Bat activity was similar between stations (**Figure 10**), but was highest at station NW2t (9.32 bat passes/detector night) and lowest at station NW1g (7.12 bat passes/detector night). Total bat activity was significantly greater in the summer season than in the spring and fall as activity was twice as high.

High frequency bat species (i.e. eastern red bats, little brown bats, and northern long-eared bats) comprised 16% of all bat passes, while low frequency bat species (i.e. big brown bat, silver-haired bat, and hoary bat) comprised 84% of all bat passes. Both hoary (2.8% of all bat passes) and eastern red bats (3.4% of all bat passes) were recorded at all three stations. Most hoary bats were recorded at station NW3t (**Figure 10**), and activity peaked in mid-summer. By August 26, no Hoary bats were recorded. Most eastern red bats were recorded at NW2t with the peak activity in mid-August.

The northern long-eared bat ranges from British Columbia and Alberta, Canada, eastward to the Atlantic Ocean and southward to Arkansas and Florida. Within the range of the western population, the northern long-eared bat is considered common in only small portions (e.g., Black Hills of South Dakota). South Dakota contains 7 known hibernacula sites for this species, 5 of which are abandoned mines (USFWS 2013a). There are no known hibernacula within 20 miles of the Project (Lou Hanebury, personal communication, November 11, 2013). The northern long-eared bat is not considered a long-distance migratory species but short migratory movements between summer roost and winter hibernacula between 35 mi and 55 mi have been documented (USFWS 2013a). In the Service letter dated February 3, 2013, regarding the BA, the Service stated that the lack of preferred habitat within the Project vicinity suggests its potential presence is low (**Appendix D**).

Red Knot

The red knot was proposed to be federally listed as a threatened species under the Endangered Species Act on September 30, 2013. The red knot is a medium-sized shorebird about 9 to 11 inches in length. Long-term survey data from two key areas (Tierra del Fuego wintering area and Delaware Bay spring stopover site) both show a roughly 75 percent decline in red knot numbers since the 1980s (USFWS 2013e).

The red knot winters at the tip of South America in Tierra del Fuego, in northern Brazil, throughout the Caribbean, and along the U.S. coasts from Texas to North Carolina. The red knot breeds in the tundra of the central Canadian Arctic from northern Hudson Bay to the southern Queen Elizabeth Islands. Red knot

migration and wintering habitats in the United States generally consist of sandy beaches that are dynamic and subject to seasonal erosion and accretion (the accumulation of sediment). Important red knot habitats tend to occur along higher-vulnerability portions of the U.S. shoreline (USFWS 2013f).

Texas knots follow an inland flyway to and from the breeding grounds, using spring and fall stopovers along western Hudson Bay in Canada and in the northern Great Plains. Stopover records from the Northern Plains are mainly in Canada, but small numbers of migrants have been sighted throughout the U.S. Great Plains States (USFWS 2013f). Not much is known of the migratory habits of the Red Knot in eastern South Dakota. The USFWS currently considers the entire state of South Dakota as part of the Red Knot range (USFWS 2013f).

The Project may affect the red knot through direct mortality resulting from turbine collisions. However, the primary migratory route of the red knot is located along the eastern U.S. shoreline. It is not known if the red knot population that migrates through the U.S. Great Plains States migrate through the Project area. The Project does not contain habitat that is known to be attractive to migrating populations of red knots.

There is no designated critical habitat for the red knot; therefore, Northern Wind's proposed Project will not affect designated critical habitat.

3.5.3 State-Listed Species

In a letter dated November 10, 2011 regarding the Project, the South Dakota Game Fish and Parks (SDGFP) did not list particular species of concern, other than bats, that may be found in the Project area; rather, the agency noted the importance of the Prairie Coteau and Prairie Coteau Escarpment ecoregions and that disturbance of native prairie and wetlands are of primary concern with regard to wind energy development (**Appendix B**).

The South Dakota Natural Heritage Program, administered through the SDGFP, submitted a report of rare, threatened or endangered species that have been documented in Roberts County. The species reported are as follows:

Bald eagle (Haliaeetus leucocephalus) – State Threatened; known to inhabit and nest in Roberts County. Bald eagles were initially protected by the Bald and Golden Eagle Protection Act in 1940. In 1978 they were listed as endangered under the Federal ESA. By 1995, the Service determined that the bald eagle should be considered threatened instead of endangered due to the increasing health of the population. In 2007 the bald eagle was removed from federal protection under the ESA, but the bird is still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Both laws prohibit killing, selling or otherwise harming eagles, their nests, or eggs. During the avian study, three observations of bald eagles were

reported, although in some cases this may represent repeated observations of the same individual. No nests were reported in the Project area.

The USWFS Eagle Conservation Plan Guidance (ECPG) (Service 2013a) provided guidance for this document. A bald eagle nest survey was conducted in April 2013. The survey was conducted during local chronologies of eagle nesting periods. The survey area included a ten mile radius of the Project area and was conducted by aircraft. Two active nests and two alternate (inactive) nests were identified (**Figure 11**). One active nest was located 4.5 miles west of the nearest proposed turbine location, while the other nest was located 8.9 miles south of the nearest proposed turbine location. Each active nest had an inactive nest on the same body of water. The nearest inactive nest is located 3.6 miles west of the nearest proposed turbine location. The mean inter-nest distance was determined to be 11.04 miles.

Dakota skipper (*Hesperia dacotae*) – State Species of Greatest Conservation Need; known to inhabit Roberts County, see above description.

River otter (Lutra Canadensis) **–** State Threatened; known to inhabit Roberts County. River otters in South Dakota experienced a population decline in the last century due to extensive trapping pressure, habitat loss or degradation, and urban development (Boyle 2006). River otters have not been able to re-establish themselves. South Dakota has identified rivers and potential habitat (SDGFP, 2012), none of which are located within the Project area.

Blacknose shiner (Notropis heterolepis) – State Endangered; historically inhabited Roberts County. Shiners are a group of minnows having metallic silver or gold coloring. The blacknose shiner is identified by the black stripe that extends from the tail to the nose, passing through the eye. The blacknose shiner requires clean, cool, well-oxygenated streams with abundant aquatic vegetation, making the species an important indicator of high water quality and pristine streams. The fish has disappeared from many streams due to sedimentation, loss of aquatic vegetation and food, water temperature increases, and lowered dissolved oxygen (Backlund 1995).

SDGFP has identified 90 species of greatest conservation need in the state (SDGFP 2006). They are categorized into five levels according to the need to conserve them. Global ranks (“G”) indicate the relative status of the species throughout their range, while state ranks (“S”) indicate the relative status of the species in South Dakota:

- G1 S1 - Critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
- G2 S2 - Imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

- G3 S3 - Either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors; in the range of 21 of 100 occurrences.
- G4 S4 - Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern.
- G5 S5 - Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.

The Dakota skipper is ranked as G2G3/S2, bald eagle is ranked as G4/S1 during breeding season and S2 in the non-breeding season, the blacknose shiner is ranked as G5/S1, the river otter is G5/S2 and the northern long eared bat is G4/S3.

3.5.4 Potential Impacts of the Proposed Project

A significant impact to wildlife resources and sensitive species would occur if: 1) the Project resulted in the loss of individuals of a population leading to the listing of or jeopardizing the continued existence of animal species; 2) the Project resulted in the loss of individuals of a population leading to a jeopardy opinion from the Service; or 3) the Project resulted in the loss of individuals leading to a negative change of the federal listing of the species.

Impacts to wildlife associated with the Project include habitat loss and fragmentation, injury or mortality caused by collision with facilities, displacement from disturbance, and disruption to wildlife behavior. Impacts can be short-term or long term. Short term impacts are generally during the construction period and affect one or two reproductive seasons. Long-term impacts may affect several generations and occur during the life of the project. Direct impacts are an immediate effect to an individual, population, or its habitat. These impacts include injury and mortality during the construction and operation of the project, loss of habitat, and displacement. Indirect impacts are those that occur later in time and may include introduction of invasive vegetation, alteration of fire cycles, increase in predators, and decreased use of the habitat that may result from effects of the project or resulting habitat fragmentation (Service 2012).

Minor displacement of wildlife and alteration of habitat would occur from the Project. Existing habitat within the construction footprints of turbines, support facilities, and access roads would be disturbed and some habitat fragmentation would occur. Approximately 34.5 acres would be affected during construction, of which only a small portion is native prairie. Approximately 12.07 acres of this would be reclaimed to a natural state resulting in a permanent disturbance of 22.43 acres. This disturbance represents a small percentage of the available habitat in the vicinity of the site. In addition, this habitat loss will be mitigated by replacement of high quality remnant native prairie in the Prairie Coteau Ecoregion. A discussion on mitigation of prairie is provided in Section 3.6, Land Use. Access roads and turbines have been sited to avoid large tracts of suitable habitat and will follow existing disturbance whenever possible to avoid impacts associated with habitat

fragmentation. Wetlands within the Project area will be avoided and remain in their current state. Temporary displacement is likely to occur during the construction period. There will be minimal impact to most species.

Avian and bat collisions are a possibility after the completion of the wind turbines and guyed met tower. Impacts to birds and bats would be minimized to the extent practicable and will be reduced by use of modern turbine and facility designs such as solid towers, buried transmission and communication lines, bird diverters, and perch deterrents. Impacts would not be expected to be significant or jeopardize the continued existence of any bird or bat species. The implementation of environmental protection measures described in Section 2.2.6 of this document would reduce and minimize potential impacts to wildlife habitats and species. The environmental protection measures include but are not limited to at least 1 year of post-construction bird and bat mortality monitoring to assess whether predictions of fatality risk and direct and indirect impacts to habitat of species concern were correct.

Dakota skipper

Surveys of the Project area were conducted to determine the presence of Dakota skippers and suitable habitat. The results reported the identification of nine Dakota skippers and some suitable habitat. Based on the findings of the survey, areas of high quality skipper habitat and areas where skippers were sighted will be avoided. Three turbines and some planned access roads have been relocated to avoid high quality skipper habitat. Even by avoiding high quality skipper habitat, some features of the Project may also indirectly impact the skipper by fragmenting suitable habitat used by Dakota skippers. Because adult skipper populations often move only short distances to seek the heaviest blooms of nectar sources, access roads and other construction may block these movements (Skadsen 2012).

Although it is not certain of the impacts that wind turbines and the associated infrastructure have on Dakota skippers, the Service Dakota Skipper Conservation Guidelines states that the destruction of Dakota skipper habitat should be avoided whenever feasible (Service 2007). This is largely because successful restoration of Dakota skipper habitat has not been documented. Minimizing impacts to suitable Dakota skipper habitat includes using alternate turbine and access road locations, micro-siting turbine features, and avoiding suitable habitat. In addition, the minimization of impacts to native prairie during Project construction would minimize impacts to Dakota skippers.

In the Service BA response letter dated February 3, 2013, the Service requested an estimate on anticipated impacts to the Dakota skipper (**Appendix D**). The Service points out that direct impacts to the Dakota skipper are difficult to quantify. The Service recommended using occupied and potentially occupied habitat that will be temporarily and permanently impacted as a surrogate to identifying direct impacts. Based on conference calls on January 13 and 31, 2014 between the Service, Western, and Northern Wind, it was determined that any temporary or permanent impacts to lands within the Project area that was classified as native prairie

would be identified as impacts to potentially occupied Dakota skipper habitat. Based on this criteria, the estimated permanent impacts to Dakota skipper habitat is 11.02 acres and the estimated temporary impacts to Dakota skipper habitat is 5.15 acres for a total impact of 16.17 acres (**Table 4**).

TABLE 4. ESTIMATED PERMANENT AND TEMPORARY IMPACTS TO DAKOTA SKIPPER HABITAT

NATIVE PRAIRIE	PERMANENT IMPACTS (ACRES)
O & M Building	0.06
Turbine Pads	1.06
Access Roads	5.38
Turnaround	3.14
Substation	1.38
Total	**11.02**
NATIVE PRAIRIE	**TEMPORARY IMPACTS (ACRES)**
Crane path	2.86
Collection lines	1.63
Crane pad	0.66
Total	**5.15**

Powesheik skipperling

Northern Wind commissioned a survey to determine the presence of Powesheik skipperlings in the Project area. No Poweshiek skipperlings were observed on the proposed Northern Wind Resource Area or other sites checked during the adult flight period in 2012 (Skadsen 2012). Wind energy production in the range of Poweshiek skipperling is increasing as many of these areas also contain some of the best prairie remnants. If turbines are placed on or near remnant prairie, the footprint could result in significant prairie loss (Selby 2005). Since Powesheik skipperlings are not present in the Project area and have not been observed in the state of South Dakota since 2008 (Skadsen 2012), the Project will have no effect on Powesheik skipperlings.

Bats

The relative activity rate in the Project area may not represent the relative abundance of bats and activity in the Project area, and may be a general index of relative risk to bats (Chodachek and Murray 2013). Total bat activity and activity during the fall migration period were compared with other wind energy facilities' data. The activity rate in the Project area was generally lower than eastern states and the Midwest states of Iowa and Wisconsin, but was higher than activity rates recorded at facilities in Minnesota (Chodachek and Murray 2013).

Migrating bats make up most of the fatalities associated with wind energy facilities. In addition, most bat fatality studies show the highest bat mortality rate occurs during the fall migration season, lower mortality in early summer, and very low mortality in the spring (Chodachek and Derby 2011, Chodacheck and Murray 2013). The Northern Wind study shows the highest number of bat passes was recorded during the summer, rather than the fall migration period. Based on the available data, it is expected that bat fatalities in the Project area will be highest late summer to early fall at potential turbine locations (Chodachek and Murray 2013). The highest levels of bat fatality rates at wind energy facilities in the Midwest have occurred within agricultural land with bat fatality rates ranging from 0.16 and 0.41 bats per megawatt (MW) per year in South Dakota.

Potential bat habitat and topographical features were evaluated by WEST to characterize bat resources within the Project area. The proposed wind energy facility is not located near any large, known bat colonies or other features that are likely to attract large numbers of bats. The Project area does not contain topographic features that may funnel migrating bats and is lacking large tracts of forest cover (Chodachek and Murray 2013). In general, native land cover, including wetlands, in most of the Project area is not unique in the region, but is of concern on a broader scale. As the land cover is not unique to the region, these characteristics are not likely to attract or concentrate species compared to surrounding areas (Chodachek and Derby 2011). Additionally, there are no known hibernacula within 20 miles of the Project (Lou Hanebury, personal communication, November 11, 2013).

The turbine cut-in wind speed will be 3.0 m/s. Northern Wind will utilize the post construction monitoring to determine if increased cut-in speeds are needed. Turbine blades may be feathered below a cut-in speed of 6.9 m/s to further reduce turbine collision risk to bats.

Bald eagle

During the avian study, three observations of bald eagles were made, but it may be the case that this is the same individual. During the avian study, no nests were reported to be within the Project area. The bald eagle nest survey did not identify any nests within the Project area, but identified two active nests and two alternate (inactive) nests within a ten mile radius of the Project area. The nearest active nest is located 4.5 miles west of the nearest turbine location and the nearest inactive nest is located 3.6 miles west of the nearest turbine location. Half of the mean inter-nest distance was determined to be 5.5 miles.

Although nesting territory size varies, several studies suggest it is common for the average nesting territory size to be approximately 1-2 mile radius of the nest (Garrett et. al 1993, Service 2013). In a report from the North Dakota Game and Fish, nesting territory was described as being 250 – 500 acres (Johnson 2010) and the Minnesota Department of Natural Resources describes average nesting territory size to be 1-2 km^2

(MNDNR 2009). The Northern States Bald Eagle Recovery plan describes essential breeding habitat is within 640 acres of the nest (Grier 1983).

Based on data collected during the Avian Use Study conducted by WEST, all bird and raptor use of the Project area was generally lower than most wind resource areas evaluated throughout the U.S. using similar methods. Bird mortality at the Project area would likely be similar or lower than that documented at other wind energy facilities located in the U.S. where observed bird collision mortality has been relatively low (Chodachek and Bay 2012).

It is possible that an individual bald eagle may move through the Project area, thereby being exposed to potential negative interactions with the Project. However, the risk of collisions from the Project will be reduced by use of modern turbine and associated facility designs such as solid towers, bird diverters and perch deterrents. Environmental protection measures described in Section 2.2.6 of this document would further reduce impacts.

The Service ECPG provides specific in-depth guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities. The ECPG guidance supplements the Service's Land-Based Wind Energy Guidelines (WEG). The ECPG suggests that projects that have eagle nests within ½ the mean project-area inter-nest distance of the project footprint should be carefully evaluated. The ECPG also states that "If it is likely eagles occupying these territories use or pass through the project footprint, category 1 designation may be appropriate" (Service 2013). Category 1 is classified as *High risk to eagles, potential to avoid or mitigate impacts is low*. Based on the regional studies mentioned above, the largest nesting territory for bald eagles is up to 2 miles. The two active nests identified in the Eagle Nest Survey (WCEC 2013) were located on relatively large bodies of water which likely provide adequate forage to prevent the eagles from use or pass through the Project footprint. Based on that assumption, the Category 3, *Minimal risk to eagles,* designation is more appropriate for this Project. Northern Wind has not completed models to predict the average number of fatalities per year.

Northern Wind will work with the Service to satisfy the requirements under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. As part of Northern Wind's commitment to responsible development, it will implement the Services' March 23, 2012 Land-Based Wind Energy Guidelines (LBWEGs) in coordination with the Service South Dakota Ecological Services Office, the Services' Mountain-Prairie Regional Office and the South Dakota Game Fish and Parks (SDGFP). As part of Northern Wind's implementation of the LBWEGs, it will develop a Bird and Bat Conservation Strategy (BBCS) in coordination with both the Service and the SDGFP using the standards provided in chapter one of the LBWEGs. See Northern Wind's letter of commitment to the FWS in Appendix C.

In addition to taking environmental protection measures to reduce effects on eagle populations, Northern Wind is providing mitigation acres for the impacts to the grassland easements. The mitigation acres have similar habitat characteristics as the locations of the observed eagle nests at Hurricane Lake and Summit Lake. The mitigation acres consist of high quality native prairie, recently planted CRP, and a large waterbody with a known fish population. While the mitigation acres are not being provided to compensate for direct impacts to migratory birds, bald eagles, and grassland songbirds, they will provide high quality habitat for these species as permanent Service grassland easement.

River otter

Suitable habitat for river otters in South Dakota has been identified. These identified waterways are not located within the Project area. In addition, the Project would not affect water quantity or quality of the area or surrounding area. The Project will have no effect on the river otter.

Blacknose shiner

Several small intermittent streams are located within the Project area. During periodic stream flow, there is a low potential for suitable habitat for the blacknose shiner. The Project would not affect water quantity or quality in the intermittent streams. The Project is located outside of the known range of the blacknose shiner therefore, the Project will have no effect on the blacknose shiner.

3.6 Land Use

The Project area is located in Roberts County, north of the town of Summit in northeastern South Dakota. The area consists of primarily rural agricultural land typical of this part of the state. The study area for land use is the Project area layout, and includes land uses within the county.

3.6.1 Existing Conditions

The land in Roberts County within the vicinity of the Project area is primarily agricultural land used for the purpose of grazing cattle and to a lesser extent as cropland. Few residences and farmsteads are located near the Project area. The Project area is located in southeastern Roberts County, eight miles north of Summit. This region of Roberts County is sparsely populated and residences are dispersed through the township. Wind turbines will be sited a minimum of 1,000 feet from adjacent property lines in order to comply with Roberts County's Draft Wind Energy Systems Zoning Requirements, Article 28.

A local ranch owns the land in the Project area, which can be described as rural agriculture. The current land use is predominately pastures used for cattle grazing with a small amount of use dedicated to cultivated fields. The cultivated fields within the Project area are small food plots located within lands enrolled in the CRP.

As the Project area is primarily rural in nature, only a few existing industrial developments are located here and include an existing overhead transmission line, a meteorological tower, and outbuildings associated with ranch operations. Although the area is rural, traffic along Interstate 29 maintains a noticeable presence. Both U.S. Interstate 29 and State Highway 15 run southwest-northeast in the southeastern most portion of the Project area. 458th Avenue is situated north-south through the Project area. Other roads within the Project area include asphalt-paved roads, gravel surfaced roads, and primitive two-track roads and trails for the purpose of ranch access.

Easements and Other Protected Lands

Wetland and grassland easements in the Project area have been purchased by the Service. Easement wetlands and grasslands are part of the National Wildlife Refuge System. A grassland easement is a legal agreement that pays landowners to permanently keep their land in grass. Land covered by a grassland easement may not be cultivated. Mowing, haying, and grass seed harvesting must be delayed until after July 15 each year. This restriction is to help grassland nesting species, such as ducks and pheasants, complete their nesting before the grass is disturbed. Grazing is not restricted in any way (Service 2010).

The grassland easements located within the Project area were enrolled in the program in December of 1999. Prior to enrollment of these grasslands in the Service program, the landowner expressed concerns to the Service regarding the permitting of wind generators on grassland easements. In a letter dated December 12, 1999 the Service responded to the landowners concerns regarding the permitting of wind generators on Service grassland easements by stating that grassland easements will only be allowed on grasslands acquired prior to January 1, 2000.

A wetland easement is a legal agreement that pays landowners to permanently protect wetlands. Wetlands covered by an easement cannot be drained, filled, leveled, or burned. When these wetlands dry up naturally, they can be farmed, grazed, or hayed. No signs are placed on the property and the easement does not affect hunting or mineral rights.

There are no Service waterfowl production areas (WPAs) within or adjacent to the Project area. There are approximately 1,875 acres of grassland easements comprising about 75.6% of the total project area. Wetland easements are located within the Project area (**Figure 8**). These easements for waterfowl habitat production are administered by the Waubay Wetland Management District (WMD).

The CRP is administered by the USDA-NRCS and Farm Service Agency (FSA). This program conserves soil and water resources and provides wildlife habitat by removing enrolled tracts from agricultural production, generally for a period of 10 years. These tracts cannot be hayed, tilled, seeded, or otherwise disturbed

without the authorization of the NRCS. Information from the landowner indicates that 192.2 acres of land, comprising about 8% of the Project area, are currently enrolled in CRP.

3.6.2 Potential Impacts of the Project

Consequences from the change in land use would pertain to physical and operational effects of the Project on existing and future land use. In the study area, impacts are related to agriculture, land easements, and nearby residents. An impact would be considered significant if the Project resulted in the uncompensated loss of crop production or forage for livestock grazing, or the Project resulted in the foreclosure of future land uses.

The Project will result in both permanent and temporary impacts of approximately 34.5 acres (1.4% of the total Project area). The permanent impacts will be from the wind turbines and pads, substation, O & M building, turnarounds, and new access roads. It is estimated that the Project would require the permanent disturbance of 22.43 acres using the following assumptions:

- 20 turbine pads at 5,153 sq. ft. each of permanent impact
- 5.89 miles of access roads at 16 feet wide of permanent impact
- Substation: 60,000 sq. ft. of permanent impact
- O & M building: 2,400 sq. ft. of permanent impact
- 13 turnarounds at 27,332 sq. ft. each of permanent impact

The temporary impacts to the Project area were derived from crane paths, underground collection lines, laydown and contractor staging areas that will be utilized during the construction phase of the Project. Approximately 68 percent of the total collection lines will be buried beneath planned access roads and follow existing county road easements. The temporary disturbance of the Project is estimated to be 12.07 acres. This estimate does not include the collection lines that follow planned access roads and existing roads. The total area of temporary disturbance is based on the following:

- Total underground electrical collection lines of 2.79 miles with 8 feet wide disturbance
- Construction laydown area of 4 acres of temporary impact
- 20 crane pads at 3200 sq. ft. each of temporary impact
- 4.07 miles of crane paths with 10 feet wide disturbance

Consideration will be taken in locating access roads to minimize impacts to land use and environmentally sensitive areas. The access roads will be 16 feet wide and low profile, to aid in crossing with farm equipment. During the construction of the wind power facilities, additional areas may be temporarily disturbed for contractor staging areas and underground power lines. These areas will be graded to original contour and reseeded with native seed mixes. The development of the Project will not result in a significant change in land use as the area will remain primarily agricultural and rural in nature. The Project area will still be

available for livestock grazing and crop production up to the edge of the access roads and turbine pads. Northern Wind has a contractual obligation to the landowner to remove the wind energy facilities, including foundations to a depth of four feet, when the wind easement expires. Upon decommissioning of the energy facility, all project components will be removed and restored to original contours and reseeded with native seed mixes.

The Project area contains approximately 1,900 acres of grassland easements. Minor impacts to these easements are expected. The construction of access roads, turbine pads, and associated facilities will result in permanent impacts to grassland easements of approximately 14.82 acres, and temporary disturbance is estimated to be 4.77 acres (**Table 5**). Approximately 1 percent of the grassland easements located within the Project area would be impacted by both short term and long term disturbance. Although wetland easements are located within the Project area, they will be avoided and no impacts are expected to occur. Upon decommissioning of the energy facility, all project components will be removed and restored to original contours, reseeded with native seed mixes and the acres will be reestablished as Service grassland easement.

TABLE 5. ESTIMATED PERMANENT AND TEMPORARY IMPACTS TO USFWS GRASSLAND EASEMENTS

NATIVE PRAIRIE	PERMANENT IMPACTS (ACRES)
O & M Building	0.06
Turbine Pads	1.42
Access Roads	6.95
Turnaround	5.02
Substation	1.38
Total	**14.82**
NATIVE PRAIRIE	**TEMPORARY IMPACTS (ACRES)**
Crane path	2.69
Collection lines	1.20
Crane pad	0.88
Total	**4.77**

As a mitigation measure for the impacts to the grassland easements, Northern Wind plans to enroll a parcel of land that is native prairie in the Service grassland easement program. The exact amount of mitigation acres has yet to be determined. Northern Wind will work with the Service to determine the amount of acres to

enroll in grassland easements. The mitigation acreage will be a minimum of 1:1 ratio of mitigation land to permanent impacts to easements. The mitigation site is located in the Prairie Coteau Ecoregion and approximately 13 miles southwest of the Project area.

Project facilities are proposed for parcels enrolled in CRP, the landowner will consult with the FSA in order to comply with the provisions for authorization of the installation of wind turbines on CRP acreage.

3.7 Socioeconomics and Environmental Justice

The socioeconomic and environmental justice analysis focuses on Roberts County.

3.7.1 Socioeconomics

The Project is in Roberts County, South Dakota, located north of State Highway 15 and west of Interstate 29 approximately 8 miles north of Summit. The site location is primarily rural agricultural and there is no indication of any new residential construction on the site. In 2010, the US Census Bureau (2010) estimated the county population at 10,149, an increase of 1.3 percent from the 2000 Census count of 10,016. Sisseton is the most populous city in the County. The population of Sisseton according to the 2010 Census was 2,470 (U.S. Census Bureau 2010).

The county contains 1,101 square miles of land, with a density of just over 9.2 persons per square mile. Approximately 61.5 percent of the population is composed of white persons who are not of Hispanic or Latino origin and 34.5 percent is composed of American Indian and Alaska Native persons. Approximately 17.3 percent of the county population is 65 years or older while only 8.2 percent of the population is under five years of age (US Census Bureau 2010).

Wilmot (2010 population 492) is the largest city near the Project area and is located approximately eight miles to the east of the Project. There are several other small cities near the Project area:

- Summit (2010 population 288) is located approximately eight miles south of the Project
- Peaver (2010 population 168) is located approximately ten miles to the northeast
- Ortley (2010 population 65) is located approximately nine miles to the southwest

Private wage and salary workers are the primary driver of the economy of Roberts County. Approximately 25 percent of the workforce is in education, health, and social services, while 11 percent work in agriculture, forestry, fishing and hunting, and mining industries. Retail trade and construction each account for about ten percent of the jobs in the county. Yet another ten percent work in the industry of arts, entertainment, and

recreation, and accommodation and food services (2010 Census). Per capita income in 2010 was $19,825; median household income was $37,708. Approximately 20 percent of the population lived below the poverty level, compared to 12.4 percent nationwide.

In 2007, there were 887 farms in Roberts County, comprising approximately 84 percent of the land area. According to the 2007 Census of Agriculture (USDA 2007), total market value of agricultural products produced in Roberts County was $135,340,000, 67 percent of which was from crops and 33 percent from livestock sales. The primary livestock is cattle and the principal crops include soybeans, corn, wheat, forage, and silage. These statistics illustrate the importance of agriculture to the county.

3.7.2 Environmental Justice

Executive Order 12898 requires federal agencies to review proposals and identify, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations to the greatest extent practicable and permitted by law (EPA 1994).

This section identifies the composition of the potentially affected population within the Project area. This analysis will ensure that all people are treated fairly and are given the opportunity to participate in the decision process and their concerns are considered. The guidelines outlined in the Council on Environmental Quality's (CEQ) Environmental Justice Guidance under NEPA were followed to analyze the environmental justice concerns that may be linked to the Project (CEQ 1997). This section will describe the distribution of low-income and minority populations, assess the impacts from the Project, and determine if there are disproportionately high and adverse human health, or environmental effects, on minority populations and low-income populations of the Project area.

Demographic data acquired form the 2010 census was used to describe the geographic distribution of low-income and minority population groups. According to the guidance, low-income populations in an affected area should be identified with poverty thresholds from the Census Bureau (CEQ 1997). The Census Tract and Block Group in which the Project area is located were chosen as the environmental justice analysis areas. This was chosen because it is the smallest geographic scale of the Project area where data is available. The Project is located in Block Group 3 of Tract 9408 in Roberts County (**Figure 12**). Economic data that represents the poverty level for Block Group 3 is unavailable for 2010; data from the 2000 census was used. Economic data from the Census Tract 9408 is required to provide the 2010 information. The county as a whole and the state of South Dakota were selected as comparison areas.

According to the 2000 Census, 12 percent of the population in Block Group 3 was below the poverty level. The 2010 Census reports that 27.3 percent of the population in Tract 9408 was below the poverty level, compared to 20 percent of the Roberts County population and 13.7 percent of the state population (**Table 6**).

TABLE 6. MINORITY AND LOW-INCOME POPULATIONS – CENSUS 2010[1]

LOCATION	TOTAL POPULATION	PERCENT MINORITY	PERCENT BELOW POVERTY
Block Group 3 in Tract 9408	859	39	12 (Census 2000)
Tract 9408	2,862	58.8	27.3
Roberts County	10,149	38.3	20
State of South Dakota	814,180	12.2	13.7

([1]) Census 2010 - unless otherwise noted

For the purpose of this report minority is defined as individual(s) who are members of the population groups American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

According to the CEQ guidance, minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. The minority population in 2010 in the analysis area was 39 percent in Block Group 3 and 58.8 percent in Tract 9408, compared to 38.3 percent for Roberts County and 12.2 percent in the state (**Table 6**). Block Group 3 is a more accurate representation of the minority population in the Project area, as it encompasses a smaller geographic area around the Project (**Figure 12**).

3.7.3 Potential Impacts of the Proposed Project

Adverse effects to the socioeconomic environment would occur if there was a degradation or commitment of existing goods and services to an extent that would limit the sustainability of existing communities. A significant impact to environmental justice would occur under the condition where low-income, minority, or subsistence populations in the region of the Project area are disproportionately affected by the Project.

Studies analyzing the socioeconomics of wind farms reported significant economic benefits to the local economy and no added public service costs to the county, school district, or state (Leistritz and Coon 2009; Grover 2002). A study by the Lawrence Berkeley National Laboratory concluded that neither the view of the wind facilities nor the distance of the home to those facilities is found to have any consistent, measurable, and statistically significant effect on home sales prices (Hoen, Wiser, Cappers, Thayer, and Sethi, 2009).

The Project will not have negative socioeconomic impacts. Construction and operation of the Project would not affect any community facilities in Roberts County. The Project would not displace any residents or agriculture buildings and no effects on permanent housing are anticipated. Socioeconomic impacts resulting from the Project would be primarily positive. Approximately 23.24 acres (<1%) of the total Project area will be permanently affected due to conversion to turbine sites, access and service roads, and a substation, but the agricultural areas surrounding each turbine can still be farmed.

During the construction of the Project, it is assumed that up to 50 workers will be required. Temporary construction jobs would provide a one-time influx of additional income to the area through increased spending on lodging, meals, and other consumer goods and services. Use of temporary lodging near the Project area will likely increase during construction. Because the Project region is sparsely populated, the addition of construction workers is not expected to exceed the capacity of any local public services, and the effects to infrastructure such as schools, hospitals, housing, and utilities would also be minimal. Expenditures for Northern Wind for products and services will benefit businesses in Roberts County.

Operation and maintenance of the facility will require few laborers, but the Project is expected to create at least two full-time permanent jobs. Sufficient permanent housing is available within the county to accommodate these laborers.

Although Census Tract 3809 has a higher percentage of persons below the poverty level compared to the county, the Project would have positive economic impacts. The Project will increase the energy output for this region of South Dakota, while allowing the area to retain its agricultural and rural status. While Census Tract 3809 shows that the residents of the tract consist of nearly 60% minorities, the residents of Block 3, which is more indicative of the Project area, are of equal percent minority as the population of Roberts County. A large percent of the minority population is American Indian. The local tribe has shown support for the Project and has indicated they are interested in Project involvement.

There is no indication that the wind turbines will be placed in an area occupied primarily by any minority group. Project impacts do not appear to be high and adverse, and therefore no determination was made regarding whether the low income and minority populations would be disproportionately affected by the Project.

3.8 Visual Resources

The study area for visual resources includes the foreground, middleground and background of the Project area. Factors that determine scenic quality include landform, vegetation, water, color, adjacent scenery,

scarcity and cultural modifications. The greater degree of natural contrasts that an area contains, the higher level of scenic quality it will possess. Visual resources are also evaluated based on viewer sensitivity. Sensitivity factors include type of use, amount of use, public interest, adjacent land uses, special areas, and other factors. These factors in combination with distance zones aid in determining the sensitivity of the Project area. Distance zones are based on relative visibility from travel routes or key observation points.

3.8.1 Existing Conditions

The topography in the Project area consists of a mostly flat landscape with small rolling hills and shallow drainages. The vegetation is characterized by tallgrass prairie, pasture, small plots of cropland, and small wooded areas associated with windbreaks, drainages, agricultural buildings, and wetlands. Most of the Project area is used for grazing livestock and hay production. The visual resources of the area are neither unique to the region nor entirely natural. The colors of the landscape are associated with these features and vary seasonally.

Key Observation Points (KOP's) are described as one or a series of points on a travel route or at a use area or a potential use area, where the view of an activity would be most revealing. This is usually along commonly traveled routes or at other likely observation points. Factors that should be considered in selecting KOP's are: angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions. KOP's for the Project include roadways such as U.S. Interstate 29 (located east of the Project area), 458th Avenue (located within the Project area), State Highway 15 (located south and east of the Project area), U.S. Interstate 29 rest area (located southeast of the Project area) and occupied residences outside of the Project area.

The area does exhibit landscape containing natural contrasts of color, line, form, and texture, but not to the degree to warrant a high scenic quality. The Project area contains a low level of sensitivity. The area does not retain a natural appearance, and the visual resources are not unique to the region. No distinctive landscape features exist in the Project area that would require specific protection from visual impairment. Existing views are primarily agricultural activity, undeveloped land, existing ranching related facilities, and vehicles traveling on U.S. Interstate 29, 458th Avenue, and low-traffic gravel roads. The principle viewers include the travelers on the aforementioned roadways and at the rest area. Other viewers include occupied residences within proximity to the Project area.

3.8.2 Potential Impacts of the Proposed Project

A significant impact to visual resources would occur if there was a visual interruption that would dominate a unique viewshed or scenic view. Wind turbines, access roads, and a substation would create contrasting elements of form, line, color, and texture against the surrounding natural elements and would result in

changes to some viewsheds. The Project will stand approximately 420 feet above ground and will be visible for many miles. In addition, the view during nighttime hours may change if the turbines require lights for aircraft safety.

The Project will not compromise the visual integrity of the area and significant impacts to visual resources are not anticipated. The Project area does not contain distinctive landscape features or unique viewsheds. In addition, there are no visual quality standards in place within Roberts County.

Shadow Flicker

Shadow flicker caused by wind turbines is defined as alternating changes in light intensity caused by the moving blade casting shadows on the ground or stationary objects. The spatial configuration of a wind turbine and receptor, as well as wind direction, time of day, season, and turbine height are all key factors related to shadow flicker.

At distances of greater than 1,000 feet between wind turbines and receptors, shadow flicker usually only occurs at sunrise or sunset when the shadow flicker cast shadows are sufficiently long. When the distance between a turbine and a receptor is greater than 1,500 meters (3,280 feet) shadow flicker is considered not noticeable.

One concern of shadow flicker is the thought it may trigger epilepsy. Generally, flashing lights most likely to trigger seizures are between the frequencies of 5 to 30 flashes per second (hertz) (Epilepsy Foundation 2010). Epilepsy Action states that no evidence supports that wind turbines can cause seizures (Epilepsy Action 2012). It is recommended that wind turbine flicker frequency be limited to 3 Hz. The operation of the Project will rotate the blades at a frequency of less than one rotation per second. No negative health effects to individuals with photosensitive epilepsy are anticipated.

Currently, there is no federal law that regulates impacts from shadow flicker. South Dakota does not have regulatory laws to address the impacts of shadow flicker. Roberts County's Draft Wind Energy Systems Zoning Requirements, Article 28 requires that distances from existing off-site residences, business and public buildings shall be 1000 feet. Although this ordinance is not specifically addressing impacts of shadow flicker, the setback distance reduces the chances of shadow flicker to occur at a receptor location. In addition, sensitive receptors are not usually located in the worst case potential shadow flicker impact zones. The nearest occupied residence is located approximately 3,600 feet south of turbine G15 and the rest area is located 3,550 feet from the nearest turbine.

3.9 Noise

The study area of noise was limited to potential receptors nearest to the proposed turbine locations.

In South Dakota wind power siting and permitting processes vary by county and/or city. Roberts County South Dakota Article 28 Draft Wind Energy Systems Zoning Requirements Ordinance states that "noise level shall not exceed 50 dBA, average A-weighted sound pressure including constructive interference effects at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a government entity."

Northern Wind will employ appropriate environmental noise criteria set by Roberts County and the guidelines provided by the EPA. OSHA regulations apply to the construction, operation, and maintenance of the facilities. OSHA permissible noise exposures are shown in **Table 7** below.

TABLE 7. OSHA PERMISSIBLE NOISE STANDARDS

DURATION (NUMBER OF HOURS PER DAY)	SOUND LEVEL (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.75	110
0.5	115

3.9.1 Existing Conditions

Noise is defined as an unwanted sound. Noise levels are measured in units of A-weighted decibels (dBA), which are roughly proportional to loudness as perceived by the average person. The assessment of noise impacts involves the anticipated noise levels at noise sensitive receptors in and near the Project area.

The Project area is located in a rural setting, and the primary land use is cattle grazing. Along the southern boundary, ambient noise is often in the form of noise emitted from traffic along I-29. In the northern portions of the Project area, which are more rural, background noise typically consists of wildlife and ranching noise such as cattle and ranch vehicles. Noise levels in agricultural areas are typically in the 40 dBA range. Existing

background noise levels of 38 to 48 dBA would be expected in the Project area. Sensitive receptors near the Project area are largely limited to scattered rural residents, the closest of which is approximately 3,600 feet from one of the proposed turbine locations.

3.9.2 Potential Impacts of the Proposed Project

A significant noise impact would occur if the Project violated local, state, or federal noise standards or guidance. Potential noise sensitive receptors within the Project area consist of one unoccupied farm site. Noise sensitive receptors outside of the Project area include scattered residential farm sites and a rest area east of Interstate 29.

The Nordex N90 turbines have been calculated to produce up to 50.0 dB(A) at a radius of approximately 825 feet (Nordex 2007). The nearest occupied residence is located approximately 3,600 feet south of turbine G15 and the rest area is located 3,550 feet from the nearest turbine. It is not expected that noise levels will exceed 50 dBA at any of the occupied residences near the Project area or at the rest area.

Temporary noise impacts would result from the construction of the Project from equipment such as heavy trucks and bulldozers. Construction noise will be avoided or minimized by following county or other applicable regulations that restrict construction hours. All reasonable efforts will be made to minimize the impact of noise resulting from construction activities.

Impacts during the operations phase include wind turbine noise, noise from project maintenance vehicles, and substation noise. Noise associated with the substation and turbines are at a level that is typical of background levels in a rural environment. Noise from traffic during the operations phase would range from light- to medium-duty vehicles. The noise levels of project operation would be lower than the noise levels associated with short-term construction activities and would result in a negligible impact to noise sensitive receptors in the analysis area.

The effects of noise produced by wind energy facilities on wildlife are largely unknown. Studies have shown that big game species tend to avoid human disturbance, and temporary displacement of wildlife is likely during construction. After construction has finished and the Project is in the operational stage some species may readjust and reoccupy a disturbed area.

3.10 Transportation

This section describes the local and regional transportation network that provides access to and within the Project area. These roadways have been identified as 457th Avenue (located west of the Project area), State Highway 15, 458th Avenue, and Interstate 29.

3.10.1 Existing Conditions

The turbine array is located on both sides of 458th Avenue, which will be used as the main route to the turbine access roads. The entire Project area is located north of State Highway 15, which intersects Interstate 29 adjacent to the southeast corner of the Project area. State Highway 15 is a major collector road and Interstate 29 is a principle arterial route. These roadways would be used during the construction and operation of the Project for workforce and deliveries. Few other roads lie within the Project area and receive a low volume of traffic. Motor vehicle traffic along the majority of roads within the vicinity of the Project area is considered light, with low speed and low volume. Count data is available for portions of Interstate 29, located just within the Project area. The Existing Average Annual Daily Traffic for the Wilmot Rest Area, at the Interstate 29 Junction with State Highway 15, is 177 (SDDOT 2011).

3.10.2 Potential Impacts of the Proposed Project

A permanent disruption of the local transportation network or the destruction of existing transportation infrastructure caused by the Project would represent a significant impact.

Disruption to local traffic is expected to be minimal, short-term, and temporary and related to the increase in traffic and the movement of heavy equipment. Interstate 29 and State Highway 15 would be the roads used to access 458th Avenue and the Project area. The construction company building the Project would comply with applicable U.S. DOT and South Dakota DOT regulations. Existing roads would be used whenever possible. The Project would include the construction of approximately 5.8 miles of access roads to provide access and maintenance associated with the turbines.

The impacts of transportation related to operation would be limited to workers commuting to the site, and deliveries of supplies for operation and maintenance. The addition of maintenance vehicles on local roads would not be noticeable, and would not result in adverse impacts to transportation facilities or traffic.

3.11 Safety and Health Issues

The study area for health and safety varied, but primarily focused on the Project area. The analysis area for Air Traffic was six nautical miles from the Project area.

3.11.1 Existing Conditions

Air Traffic

The Whipple Ranch Airport, FAA ID SD65, is located approximately 6.5 nautical miles northwest of Wilmot and is located within 1.5 nautical miles of the Project area. It is privately owned and permission is required prior to landing. There is no control tower (Airnav 2012). There are no public airports within six nautical miles of the Project area. Whipple Ranch Corporation owns this airstrip and the private land leased to Northern Wind in the wind farm footprint.

Telecommunication Interference

Wind turbines have the potential to interfere with weather surveillance radar as well as non-federal beam paths. Non-federal beam paths provide the telecommunication backbone of the country as they provide personal communication, radio, and television services. The interruption of weather surveillance radar is a concern to air traffic control, weather radar systems, and branches of the government who rely on these systems. The potential impacts are greatest within 10 nautical miles of a radar unit.

Electromagnetic Fields

Electromagnetic fields (EMF), arising from the flow of electricity and the voltage of transmission lines, are present around any electrical device including wind turbines, collection lines, and substations. The intensity of the electric field is associated with the voltage of the line, and gets weaker with distance. Current passing through any wire conductor produces a magnetic field in the area around the wire. Research on the effects of EMF has not indicated any known discernible health impacts from power lines. Turbines and collector lines will be no closer than 1,000 feet to occupied residences, where EMF will be at background levels.

Hazardous Materials / Hazardous Waste

Hazardous materials associated with the construction of the Project would consist of fuels and lubricants used for operation and maintenance of vehicles, turbine equipment, and the substation. Fluids used in the operation of the turbine include gear box oil, hydraulic fluid, and gear grease. Other hazardous materials include small amounts of adhesives, solvents, paints, propane, and coolants that would be used in the construction stage at the Project area. The risk of hazardous materials release is negligible.

3.11.2 Potential Impacts of the Proposed Project

A significant impact to public safety and health would occur if the Project resulted in: 1) an increase in personal injuries; 2) an increase in health risk to area residents; 3) impacts to public health as a result of increased electric and magnetic fields; or4) a violation of federal, state, or local regulations regarding handling, transport, or containment of hazardous materials.

Air Traffic

The FAA will review the proposed turbine locations as the installation of wind turbines may create a potential for impacts to air traffic. Based on a preliminary study of airports in the area, it is expected that a "no hazard" determination will be declared for all the turbines. Construction will not begin without FAA determination of "no hazard" for each turbine or prior to acquiring an approved lighting plan from the FAA. No new overhead transmission lines will be constructed, and the wind turbines and meteorological tower themselves will be visible from a distance. No impact to air traffic is anticipated.

Telecommunication Interference

The National Telecommunications and Information Administration (NTIA) will be contacted regarding the Project. Based on knowledge of the area, the Project will have a low risk of impacting radar data. No impact to telecommunication interference is expected.

A beam path study was conducted to identify all non-federal microwave telecommunication systems. The worst-case Fresnel zones (WCFZ) for each beam path were calculated and have been avoided for all turbine locations. The data indicates that the turbines would not impact the beam paths.

Electromagnetic Fields

The Project area is located in a rural area with limited human use. The nearest occupied residence is located approximately 3,600 feet south of turbine G15. No impacts to human health and safety from electromagnetic fields are anticipated. Research on long-term exposure to EMF effects has not provided uniform conclusions, but it is generally accepted that EMF is not a health and safety issue that is related to wind turbines.

Hazardous Materials / Hazardous Waste

No extremely hazardous materials are anticipated to be associated with the operation of the Project. Industry standard operating procedures will be utilized to handle materials. Should accidental spills or leakage occur during routine procedures such as gearbox maintenance and truck fueling, industry standard operating procedures will be implemented to contain and mitigate spills. No significant impacts to the environment are anticipated during construction or operation.

3.12 Cultural Resources

Cultural Resources are often identified as locations of past human activity on the landscape. These resources include historic and archaeological sites, historic structures, objects, and can include sites of religious and cultural significance to social or cultural groups. Cultural Resources are identified through appropriate identification efforts, which may include background research, consultation, oral history interviews, sample

field investigations, and field survey. The National Historic Preservation Act (NHPA) of 1966 established the Advisory Council on Historic Preservation (ACHP) and the National Register of Historic Places (NRHP). Section 106 of the NHPA mandates that federal agencies consider the effects of an undertaking on cultural resources that are listed or eligible for inclusion in the NRHP, which are referred to as "historic properties." Northern Wind has contracted with McFarlane Consulting to conduct archaeological and architectural cultural resource studies in order to identify historic properties within the Project's Area of Potential Effect (APE).

3.12.1 Existing Conditions

Archaeology

A Level I records search was conducted by the staff of the South Dakota's Archaeological Research Center, South Dakota State Historic Preservation Office (SHPO). The search was conducted for the Project APE which includes a one mile visual buffer as determined by Western and the Tribal Historic Preservation Office (THPO) of the Sisseton Wahpeton Oyate (SWO) through consultation. Under section 101(d)(2) of the NHPA, the SWO has taken on the duties of the State SHPO within the exterior boundaries of the Lake Traverse Reservation. The site files at the Office of the State Archaeologist do not list any known archaeological sites within a one mile radius of the Project APE (McFarlane 2013).

A Level III cultural resource inventory of the APE was conducted in the spring of 2012, fall of 2012, and again in the spring of 2014 due to layout changes. The Project APE is defined as all areas where ground-disturbing activities are likely to occur. Project components include a 500-foot by 500-foot survey area for each wind turbine (20), one 15.34 acre laydown yard, one 1.2 acre substation, one 1 acre operations and maintenance yard, a 5 acre laydown yard, 5.8 miles of access roads with a 75 foot right-of way, 8.24 miles of underground collection line corridor with a 200 foot right-of-way and 8.28 miles of crane path corridor with a 75 foot right-of-way. The total area surveyed is approximately 450 acres.

The Level III inventory identified one prehistoric mound, 39RO0144, within the Project APE.

G-3 Mound Site 39RO144

Site 39RO0144 is a low, oval, mound measuring 42 feet in diameter and is fairly intact except for rodent burrows and erosion. Burial mounds are protected under South Dakota law and intentionally disturbing human skeletal remains or funerary objects is a felony (SDCL 34-27-26). McFarlane recommended no earth disturbing activity within 100 feet of the mound (McFarlane 2013).

Architectural Resources

The Project's visual APE was established as the area within one mile of the Project turbines. A search of the NRHP website and the SHPO database was conducted to identify any listed resources within the APE. No NRHP properties were listed. In addition, SHPO records were searched for structures potentially eligible for the National Register. No sites were identified. A search of the county plat books (1903, 1910, 1923 and

1927), USGS maps and aerial imagery were also examined to identify possible farmsteads, standing structures and other areas of historic interest within the APE. A total of twenty-seven farmsteads, one residence and two schoolhouses were identified.

Impacts to architectural resources are considered significant if a site that is listed, or is eligible for listing, in the NRHP would be affected by the Project. Effects can be either direct, which involves physical harm to a listed or eligible resource, or indirect, which involves a change in the setting, feeling or associations related to a listed or eligible resource.

A Class II architectural survey was conducted in May, 2013. The purpose of the survey was to evaluate the potential for adverse effect (both direct and visual) that the Project may pose on historical and architectural resources located within the projects APE. The survey determined that the residence, schoolhouses and eleven of the farmsteads no longer exist. Sixteen of the farmsteads identified during the records search still remain, containing a combined total of eighty structures. Of those, thirty-three structures are modern (less than 50 years old) and forty-seven are historic, including ten that are collapsed ruins. None of the thirty-seven remaining historic structures are recommended as potentially eligible for nomination to the NRHP (McFarlane 2013b).

3.12.2 Potential Impacts of the Proposed Project

Impacts to cultural resources are considered significant if archaeological, tribal, or historical sites that are either listed on the NRHP or eligible for listing on the NRHP (historic properties) cannot be mitigated for or avoided.

It is expected that there will not be a significant impact to cultural resources. All sites that have been identified will be avoided by re-routes and turbine shifts (micro-siting) and marked in the field. Significant findings and management recommendations for one location (Site 39RO0144) were described by McFarlane Consulting. These recommendation for avoidance will be adhered to. Additional surveys will be conducted if any aspect of the Project APE changes in the future.

Western has reviewed the archaeological and architectural cultural resource inventory reports and has determined that if the preceding avoidance measures are followed, there will be no historic properties affected. Western, through the section 106 consultation process will seek concurrence from the THPO/SHPO regarding this determination.

The construction and operation of the Project will not impact these sites. However, if unidentified historic or archaeological materials are uncovered during construction, the operator will notify the appropriate personnel immediately. An emergency discovery plan which includes contact information has been developed.

3.13 Native American and Religious Concerns

Native American tribes have been consulted concerning the identification of Traditional Cultural Properties (TCP) that may be affected by the Project. Letters were sent to sixteen tribes, the South Dakota Department of Tribal Relations, and to the Bureau of Indian Affairs office at the Great Plains Regional Office on September 29th, 2011 as an invitation to the public scoping meetings and the opportunity to comment on the Project. To date, three tribes (SWO, Crow Creek Sioux Tribe, and Standing Rock Sioux Tribe) have participated in the consultation process.

The Tribes have requested that a Tribal cultural survey take place within the Project APE to identify cultural areas important to the Tribes. Western has determined that possible historic properties may exist in the Project APE and recommended that a Tribal cultural survey be conducted. The SWO preferred contractor, Makoche Wowapi, conducted a TCP study within the Project APE. Nine cultural locations were identified by Makoche Wowapi during this study. These locations have not been evaluated for listing on the NRHP.

3.13.1 Existing Conditions

This region of South Dakota has been traditionally used by Native Americans since pre-recorded time, and at present 16 identified tribes have a connection to the Project area. Through consultation with the SWO THPO, a Tribal cultural survey of the Project area was completed in September, 2012 and May 2014. Members of the Makoche Wowapi field crew identified cultural properties at 9 wind turbine pad locations. Approximately 228 stone features were identified within the APE. Stone features identified included stone rings, stone effigies, purported burials, and stone alignments (Mentz 2013).

3.13.2 Potential Impacts of the Proposed Project

Significant impacts would occur if the Project created an adverse effect to a Tribal cultural location. The Project is not expected to cause an impact to these locations. Avoidance measures have been taken to eliminate potential impacts to locations identified by the Tribal study. The avoidance measures include micrositing of the turbine locations. An on-site meeting with the Makoche Wowapi was conducted on November 7, 2012 and May 27, 2014 to microsite the Project layout as a consequence of the results of the Tribal study. Micro-siting the turbine locations minimizes the possibility that surface disturbance would occur within or immediately adjacent to the boundary of an identified cultural location during construction activities associated with the Project. Nine turbine pads were micro-sited to final locations with a 100 ft buffer around the identified cultural location removing any potential adverse effect through avoidance as recommended (Mentz 2013).

Western has determined that the above avoidance measures were appropriate and that there will be no historic properties affected per section 800.3(c)(4), as a letter of determination was submitted to the SWO THPO on October 22nd, 2013.

A Tribal Monitoring Contractor will manage the monitoring of construction activities at the Project area. The purpose of the monitoring will be to observe construction-related activities that could potentially adversely affect archaeological sites and Tribal cultural locations, advise the Project construction manager to adjust construction-related activities to avoid known cultural resources, and identify unanticipated cultural resources uncovered during construction. The monitoring activities are described in full detail in the Tribal Monitoring Plan. If a potential cultural resource is discovered during construction, the operator will halt work and notify the appropriate organization or contact person. An Inadvertent Discovery Plan which includes contact information has been developed.

3.14 Cumulative Effects

NEPA requires an assessment of potential cumulative impacts. The CEQ regulations implementing NEPA define a "cumulative impact" as follows:

> …the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts would occur if the incremental impacts of the Project, when added to the environmental impacts of the past, present, and reasonably foreseeable future actions in the vicinity of the Project combined to result in an adverse effect to regional resources. The analysis of cumulative impacts addresses both positive and negative impacts.

Geographic Boundary of the Cumulative Impacts Analysis.
The Robert County boundary will be used to define the study area for the cumulative impacts.

Past, Present and Foreseeable Future Action
Actions that were evaluated include past actions with relevance to the current resource condition, present actions of relevance that are not part of the Project, and reasonably foreseeable future actions of relevance that are not part of the Project.

Development in Roberts County has mostly been related to agriculture. The Project is located in a part of Roberts County that is fairly remote and undeveloped. Rural residences are scattered sparsely throughout the area. The travel of vehicles on Interstate 29, state highways, local gravel and paved roads, agricultural activities, and the operation of the existing transmission line are the primary activities that have and are presently occurring in the area. It is also worth noting that there is an existing wind farm in neighboring Day County, SD. This wind farm is comprised of 66 1.5 MW turbines, with a nameplate capacity of 99MW.

It is uncertain as to what developments will occur in the future, but it is presumed that most development in Roberts County and near the Project will be related to agriculture. Agriculture and ranching activities are ongoing and are likely to persist into the future, therefore they will be included in this section.

It is also probable that there may be more wind energy development in the area of the Prairie des Coteau due to the high wind potential and the growing need to develop wind energy. If development of wind energy does increase in the area, the need for transmission lines will increase as well. Because neither wind energy projects, nor transmission line projects are currently in the planning process or have been proposed, these will not be included in the cumulative impacts assessment.

The principal resources of concern for cumulative impacts are anticipated to be land use, vegetation, wildlife, and visual resources. Each of these is discussed below. It is anticipated that the cumulative impacts associated with this Project will be positive for socioeconomics and air quality.

Land Use and Vegetation

Native Prairie in the region has been on a decline over the years. This is largely due to conversion of prairie to cropland and agricultural uses. As the prices of crops continue to increase it is estimated that this loss will continue. Other historic and ongoing impacts include grazing and the supporting developments, which are common in this rural landscape. These activities contribute to the loss of native prairie and can introduce invasive species into native vegetation habitats. Other losses of native prairie include the development of wind energy facilities and transmission lines. Some concern has arisen about the loss of native prairie due to this wind energy facility. Although throughout South Dakota a great loss of native prairie has occurred, the remaining amount of prairie is not known for Roberts County. The Project area is anticipated to have an effect on approximately 40 acres of land cover. Of the 40 acres, only 11.35 acres will be permanent impacts occurred to remnant native prairie. To mitigate for losses of native prairie, Northern Wind plans to enroll a parcel of land that is high quality native prairie in the Service grassland easement program. The exact amount of mitigation acres has yet to be determined. Northern Wind will work with the Service to determine the amount of acres to enroll in grassland easements. The mitigation acreage will be a minimum of 1:1 ratio of mitigation land to permanent impacts to easements. The mitigation site is located in the Prairie Coteau Ecoregion and approximately 13 miles southwest of the Project area.

As wind energy developments increase, the land being used for agriculture and ranching operations will be slightly impacted. In general the Project is compatible with grazing and farming related activities. In addition, the additional income generated from the wind energy facilities will likely offset losses incurred to agriculture, and will aid in allowing farmers and ranchers to maintain their land in its current state to avoid development of other facilities. Wind energy development removes less total land from agricultural use than most other forms of development.

Wildlife

There is a potential for loss of habitat that birds and other wildlife rely on, through the development of this Project and other agricultural developments. Long-term surface disturbances incrementally add to wildlife habitat losses, habitat fragmentation, and may result in animal displacement. Even though the Project will avoid wetlands, there is a potential for habitat loss to occur though habitat fragmentation. Northern Wind will mitigate for any habitat loss, by acquiring and preserving similar habitat that is of high quality native prairie and enrolling it in the Service grassland easement program.

Visual Resources

As the area undergoes development from agriculture, transmission lines, and this Project, there will be changes in the landscape. New contrasts of shape, color, and texture will occur in the area. The proposed Project will cause a minor contribution to the cumulative impacts of visual resources

3.15 Intentional Destructive Acts

Wind farms and other installed infrastructure such as Northern Wind may be the subject of intentional destructive acts ranging from vandalism and theft to sabotage and acts of terrorism intended to disable a project. Vandalism and theft are far more likely for such projects in general and particularly for those like the proposed Project, which is in a relatively remote area with relatively small populations. Intentional sabotage or terrorist acts would not be expected to target Northern Wind, where a loss of service would not have substantial regional impacts.

Theft is most likely to involve substation and switchyard equipment that contains salvageable metal (e.g., copper and aluminum) when metal prices are high. Vandalism, on the other hand, is more likely to take place in relatively remote areas, and perhaps more likely to involve acts of opportunity (e.g., shooting out transmission line insulators, shooting at the blades on a wind generator) than premeditated acts.

With respect to the proposed Project, certain project facilities, such as the substations, would be protected from theft and vandalism by fencing and alarm systems. The presence of high voltage would also discourage theft and vandalism. The relatively remote location of the proposed Project would tend to reduce vandalism because of the small number of people who would be expected to encounter the turbines and infrastructure. However, this same remoteness might encourage a rare act of opportunistic vandalism. Such occurrences

would be infrequent and would be vigorously investigated and prosecuted to discourage further acts. Vigorous prosecution of thieves and monitoring of metal recycling operations might deter the theft of equipment. Similarly, the prosecution of vandals who have damaged or destroyed project equipment might discourage vandalism.

The effects of intentional destructive acts could be wide ranging or more localized, depending on the nature and location of the acts and the size of the project, and would be similar to outages caused by natural phenomena such as storms and ice buildup. Since the wind project taps the Western system, destructive acts to the wind project would not have a local or regional effect since auxiliary power would come from other sources than the wind turbines.

Destructive acts could cause environmental effects from damage to the facilities. Two such possible effects would be fire ignition, should conductors be brought down, and oil spills from equipment (e.g., mineral oil in transformers) in the substations, should that equipment be damaged or breached. Fires would be fought in the same manner as those caused by an electrical storm. Any spills would be treated by removing and properly disposing of contaminated soil and replacing it with clean soil. Implementation of the Western Standard Construction Practices and Northern Wind Mitigation Measures would be applied to any intentional destructive act.

Vandalism, Sabotage, and Terrorism

The proposed Project would be located in a fairly remote area having few residents, and on private property. Resident landowners would be expected to be vigilant concerning unauthorized persons on their property, and the presence of Project personnel on site would add additional observers. Security measures would be taken during construction and operation, including temporary and permanent safety fencing at the substation, and warning signs and locks on equipment and wind power facilities. Turbines would sit on solid-steel- enclosed tubular towers within which all electrical equipment would be located, except for the pad-mounted transformer at the base of each turbine. Access to the turbines would only be through a solid steel door that would be locked when not in use. The substation would be security fenced and controlled by key and lock. These measures would act to reduce potential vandalism, sabotage, and terrorist acts.

The proposed Project would not constitute an attractive target for sabotage or terrorism, as the facilities would be difficult to damage, and the impact from any successful act would be negligible, both from a practical and political perspective. Western believes, therefore, that the proposed Project would present an unlikely target for an act of terrorism, and would have an extremely low probability of attack.

The highest risk of damage to the proposed Project would be from casual vandalism and targeted metal theft. Vandalism could take many forms, and would be very difficult to entirely prevent, as these acts are

often spontaneous and opportunistic in nature. Examples would include damage to tower doors due to attempts to gain access, or damage to Project components from shooting or vehicles. Metal theft is an increasing problem for utilities, as the industry uses large amounts of copper and aluminum. Theft of these metals can be extremely hazardous to the thieves because of electrocution risk. Standard security measures would limit access and deter many potential intruders, as would landowner and maintenance worker monitoring. The potential for the Project to be targeted by sabotage or terrorism would be negligible. There would be some risk of vandalism or theft, but no more than that to other similar facilities in the area.

3.16 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system. Environmental impacts from construction, operation, and maintenance associated with the Project would not occur. Existing land uses in the area would continue to be consistent with current or planned practices. Potential impacts of wind energy development would not occur at the site

4.0 AGENCIES CONSULTED

A public scoping meeting was held on October 13, 2011 in Wilmot, South Dakota. Federal, state and local agencies were invited to the meeting to provide comments regarding the proposed Project. The general public was invited through newspaper and radio announcements and residents near the Project were invited to comment. The public scoping meeting summary and documentation is included in **Appendix A**. Comments received regarding the proposed Project from agencies and the public are included in **Appendix B**

4.1 Federal Agencies

The federal agencies that were contacted for the purpose of the EA scoping process are:

- Advisory Council on Historic Preservation
- Farm Service Agency
- Federal Emergency Management Agency
- Federal Energy Regulatory Commission
- Federal Highway Administration
- Natural Resources Conservation Service
- U.S. Department of Agriculture
- U.S. Department of the Interior
- U.S. Department of Transportation
- U.S. Environmental Protection Agency, Region 8
- U.S. Fish and Wildlife Service
- U.S. Geological Survey, Central Region
- U.S. House of Representatives
- U.S. Senate

4.2 State and Local Agencies

The state and local agencies that were contacted for the purpose of the EA scoping process are:

- Office of the Governor
- Governor's Office of Economic Development
- South Dakota Department of Agriculture
- South Dakota Department of Environment and Natural Resources
- South Dakota Department of Transportation
- South Dakota Game Fish and Parks Department
- South Dakota House of Representative
- South Dakota Senate
- South Dakota Public Service Commission

- South Dakota School and Public Lands
- South Dakota State Farm Service Agency
- South Dakota State Historical Society
- Roberts County Conservation District
- Roberts County Commission

4.3 Native American Tribes and Associated Bodies

Letters of invitation to the public scoping meeting were sent to sixteen tribes, the South Dakota Department of Tribal Relations, and to the Bureau of Indian Affairs office at the Great Plains Regional Office on September 29th, 2011. An initial tribal consultation meeting was held on December 6, 2011 with tribal representatives of the Sisseton Wahpeton Oyate, Crow Creek, and Standing Rock Tribal Historic Preservation Offices. Response letters and comments received are included in **Appendix B**. Currently; three tribes (Sisseton Wahpeton Oyate, Crow Creek Sioux Tribe, and Standing Rock Sioux Tribe) are participating in the consultation process.

4.4 Non-governmental Organizations

Non-governmental organizations have been contacted to participate in the EA scoping process. The non-governmental organizations that were contacted for the purpose of the EA scoping process are:

- American Bird Observatory
- Ducks Unlimited
- Isaak Walton League of America
- Pheasants Forever
- Prairie Hills Audubon Society
- Sierra Club
- The Nature Conservancy

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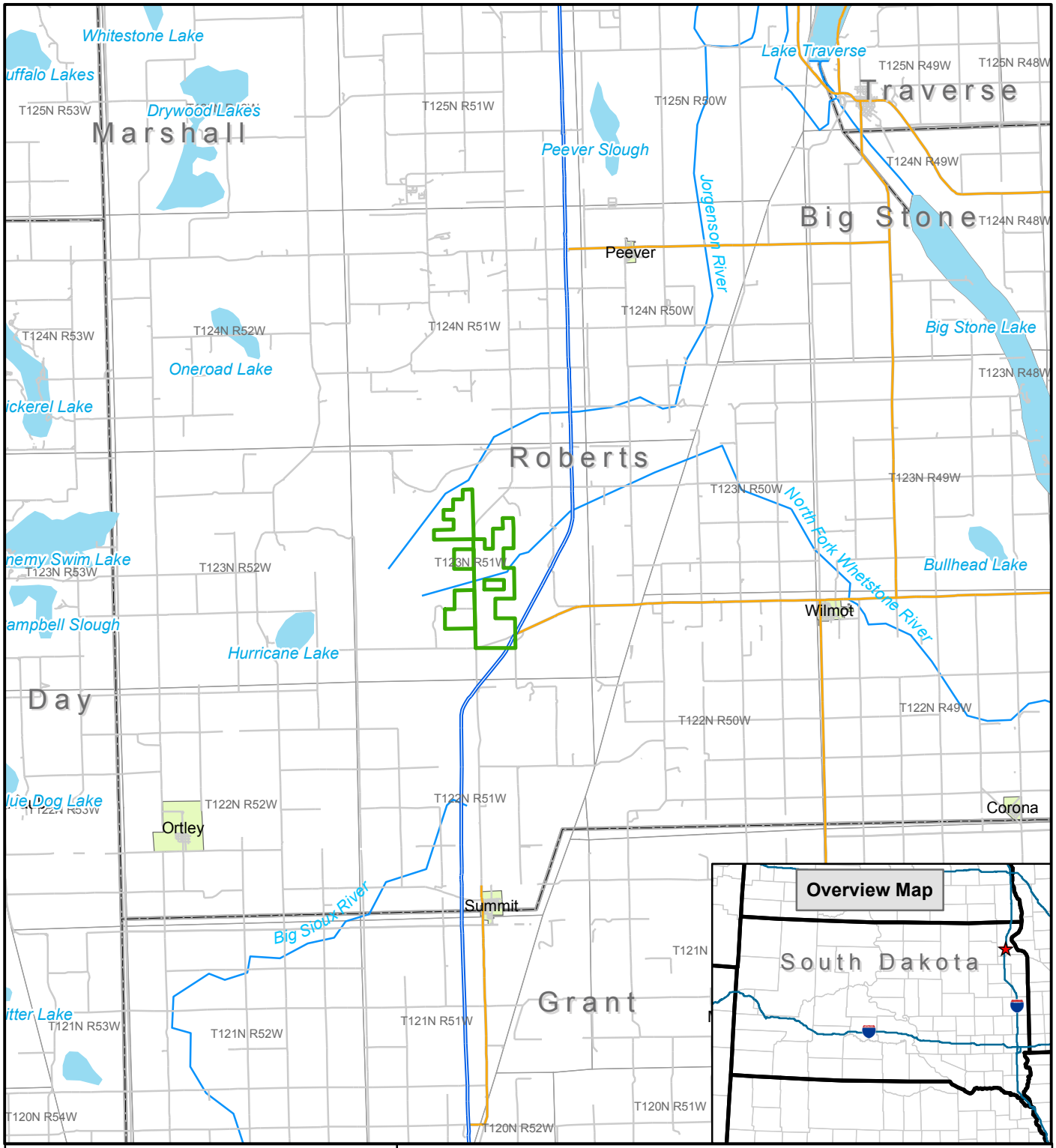
Figure 1: Site Location Map



Northern Wind, LLC

Northern Wind
Roberts County, SD

July 2012

WCEC
ENVIRONMENTAL CONSULTANTS

Map Created By: RP
December 2011

Figure 1: Project Location

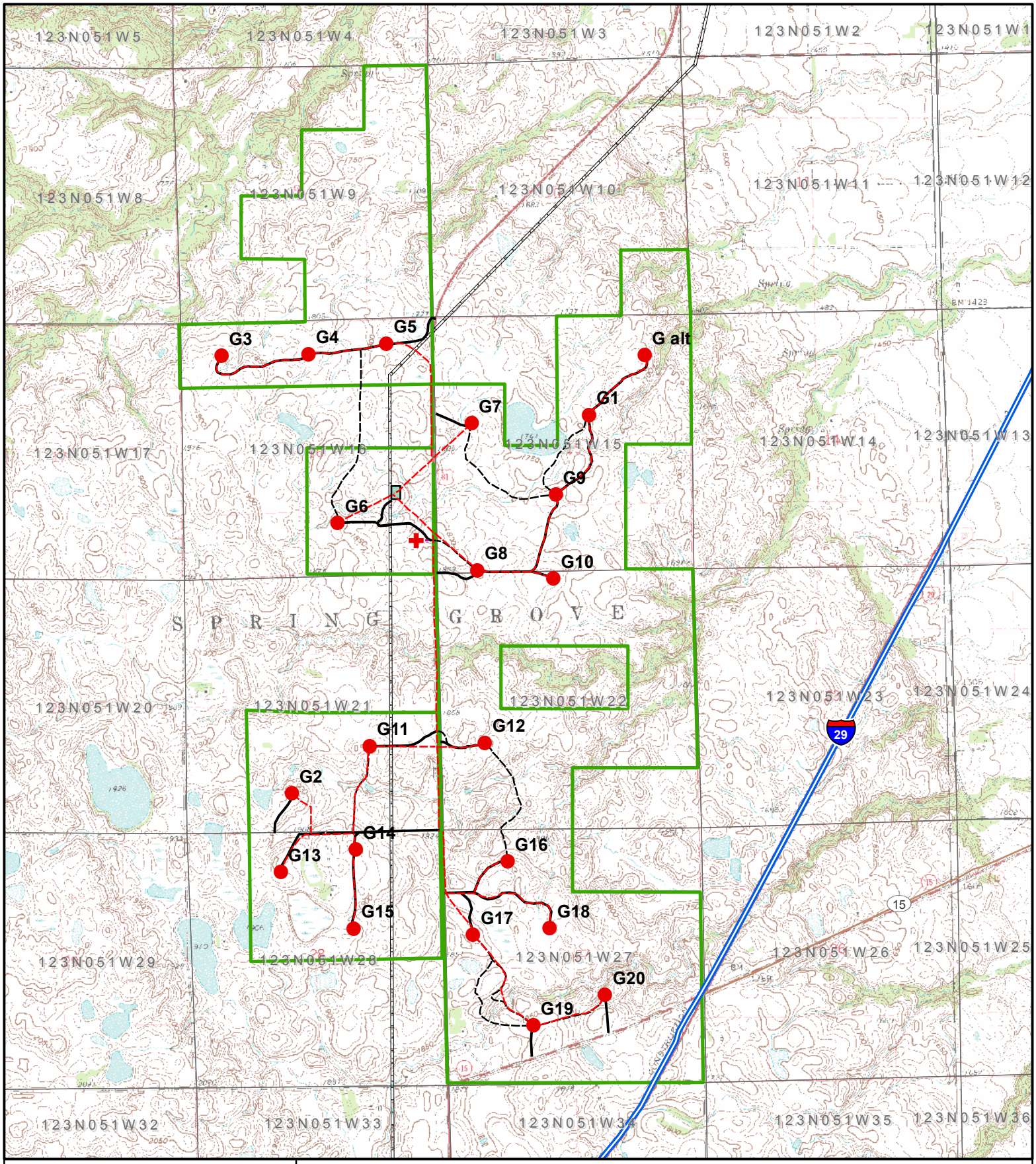
Legend

- Northern Wind Project Area
- Interstate
- Highway
- Local Road
- Rivers and Streams
- Water bodies
- Cities
- counties
- T and R Boundary

0 1 2 3 4 5 Miles

N

Figure 2: Site Detail



Northern Wind, LLC

Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 2: Project Detail

- Tubine Locations
- Northern Wind Project Area
- O and M Building
- Met Tower
- Collection Lines
- Substation
- Crane Paths
- 115 kV line
- Access Roads

N

1:31,680

0 0.25 0.5 1 Miles

Figure 3: Proposed Wind Turbine Design

Figure 3: Proposed Wind Turbine Design

NAME: Northern Wind LLC. Roberts County South Dakota

DATE: January 3, 2012 SHEET: 1 OF 2

SUBJECT: 2.5 MW Wind Turbine Sketch Elevation (Not to Scale)

American Renewable Energy Solutions, LLC. Tower Height: 80 m, Rotor Diameter: 100 m

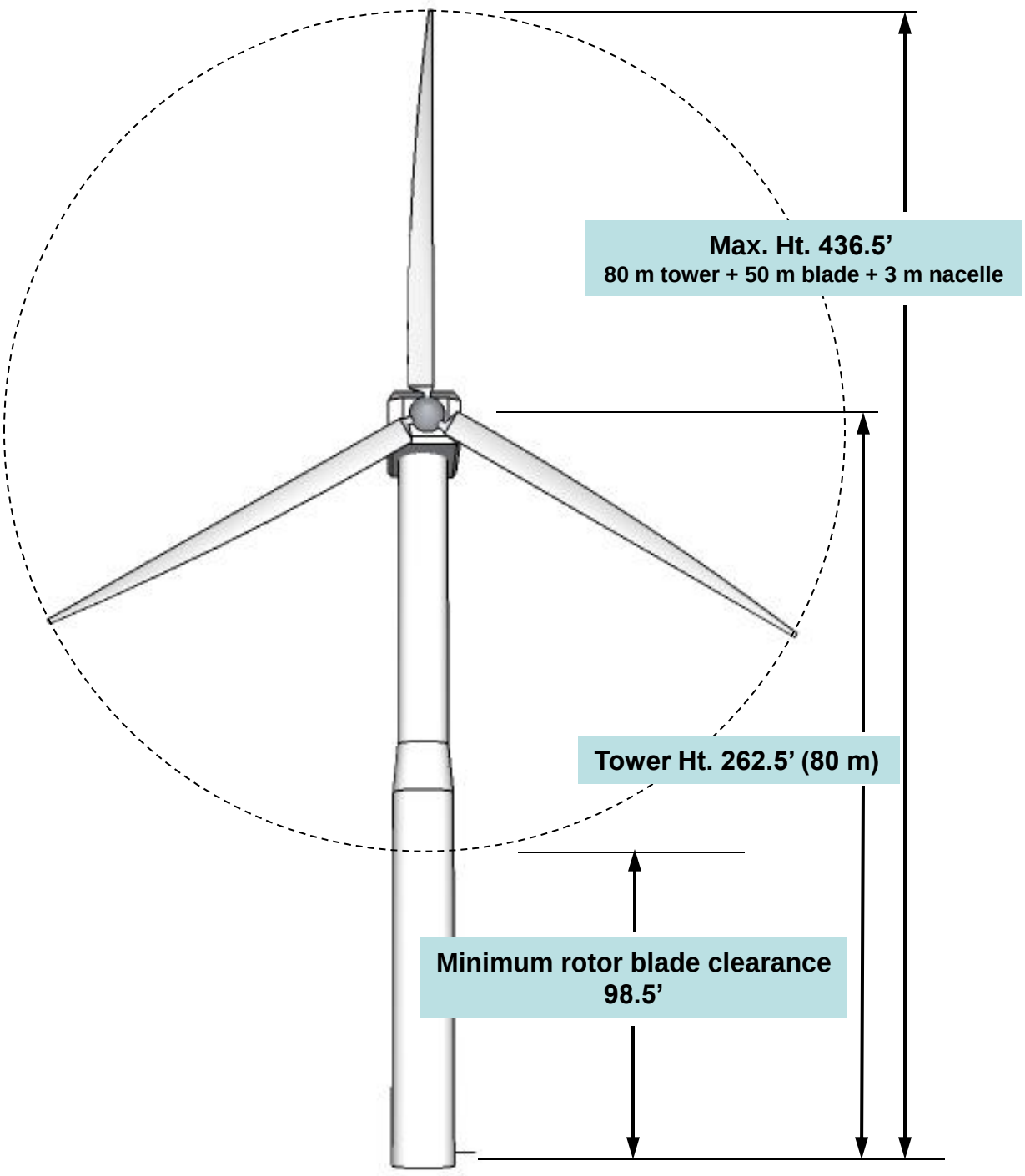


Figure 4: Substation Site Plan

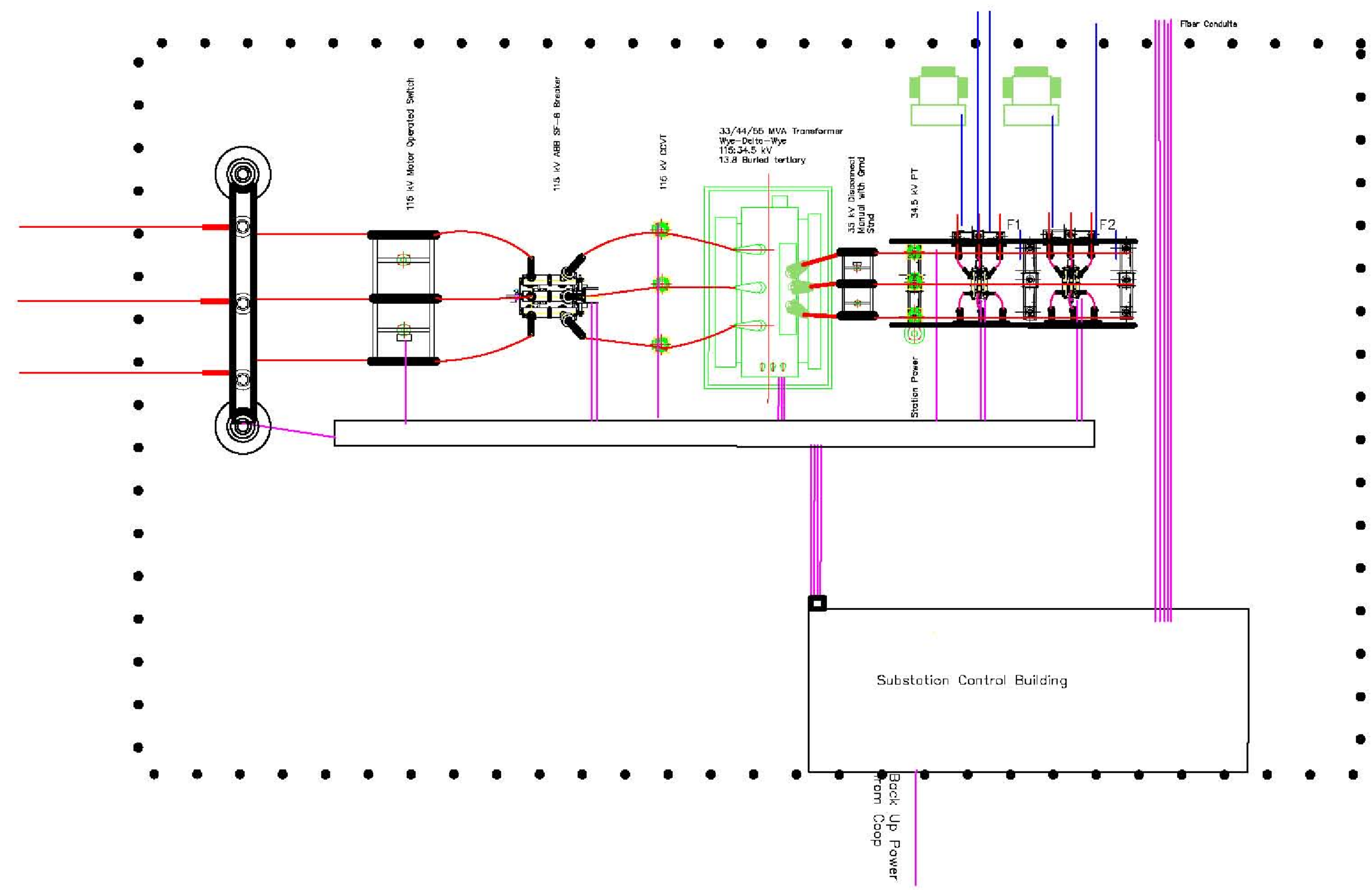


Figure 4: Northern Wind Substation Site Plan

CAD SOFTWARE
FOLDER FILES XXXXXXX
FOLDER FILES XXXXXX

Fiber Ducts

Mod. | Modified by MTN | Mod.

ISSUED
CHECKED
STANDARD
REV.DATE

ORIGIN

WANZEK
Heavy/Industrial Constructors

SUBSIT.

SCALE NTS

RESP. DEPT

SUBSIT BY

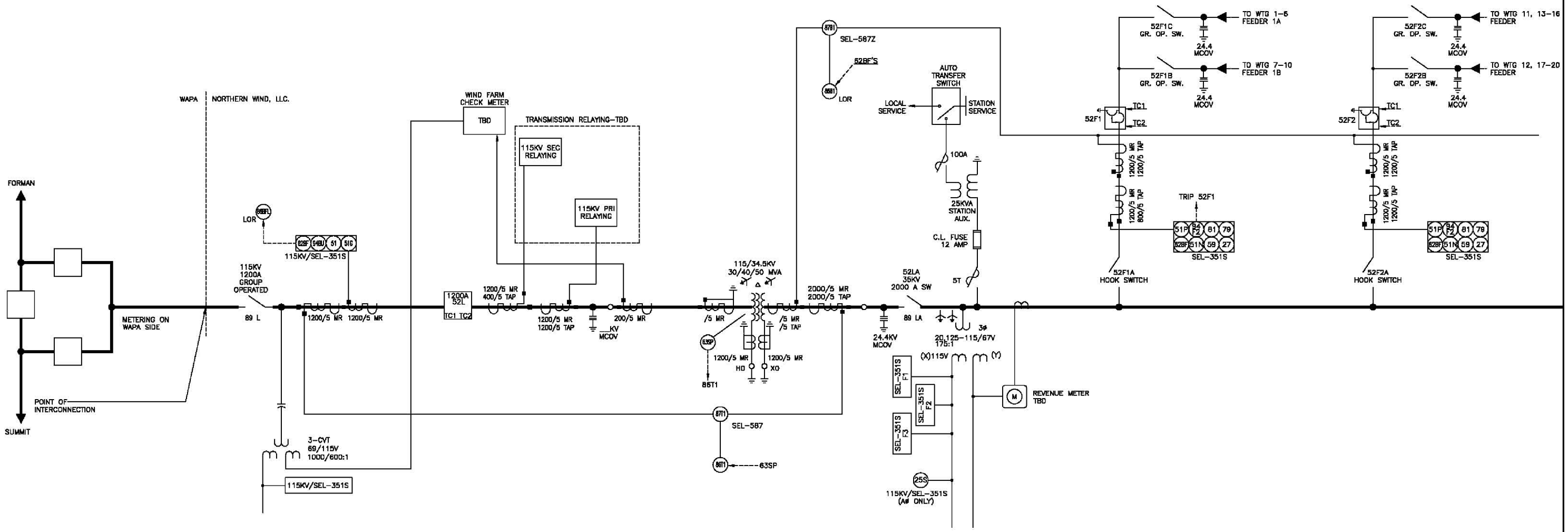
TITLE
TOP VIEW
Illustration Only

GROUP XXXXXXX
N.FOLDER: N.ELENCO
Doc. FORMAT: FORMATO: A4 LANGUAGE Lingua I/E

12/15/10
Northern Winds Wind Farm
Substation Conceptual
General Arrangement

SHEET N: N.SHEET
SHEET N: N.SHEET

Figure 5: One Line Diagram



PRELIMINARY

Figure 5: Northern Wind One Line Diagram

REV.	DATE	DRAWN	DESCRIPTION	WORK ORDER	CHKD	APPD	DATE
A	11/12/10	JKC	ISSUE FOR REVIEW				

CEG CONSULTING ENGINEERS GROUP
FARMINGTON MINNESOTA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF

NAME

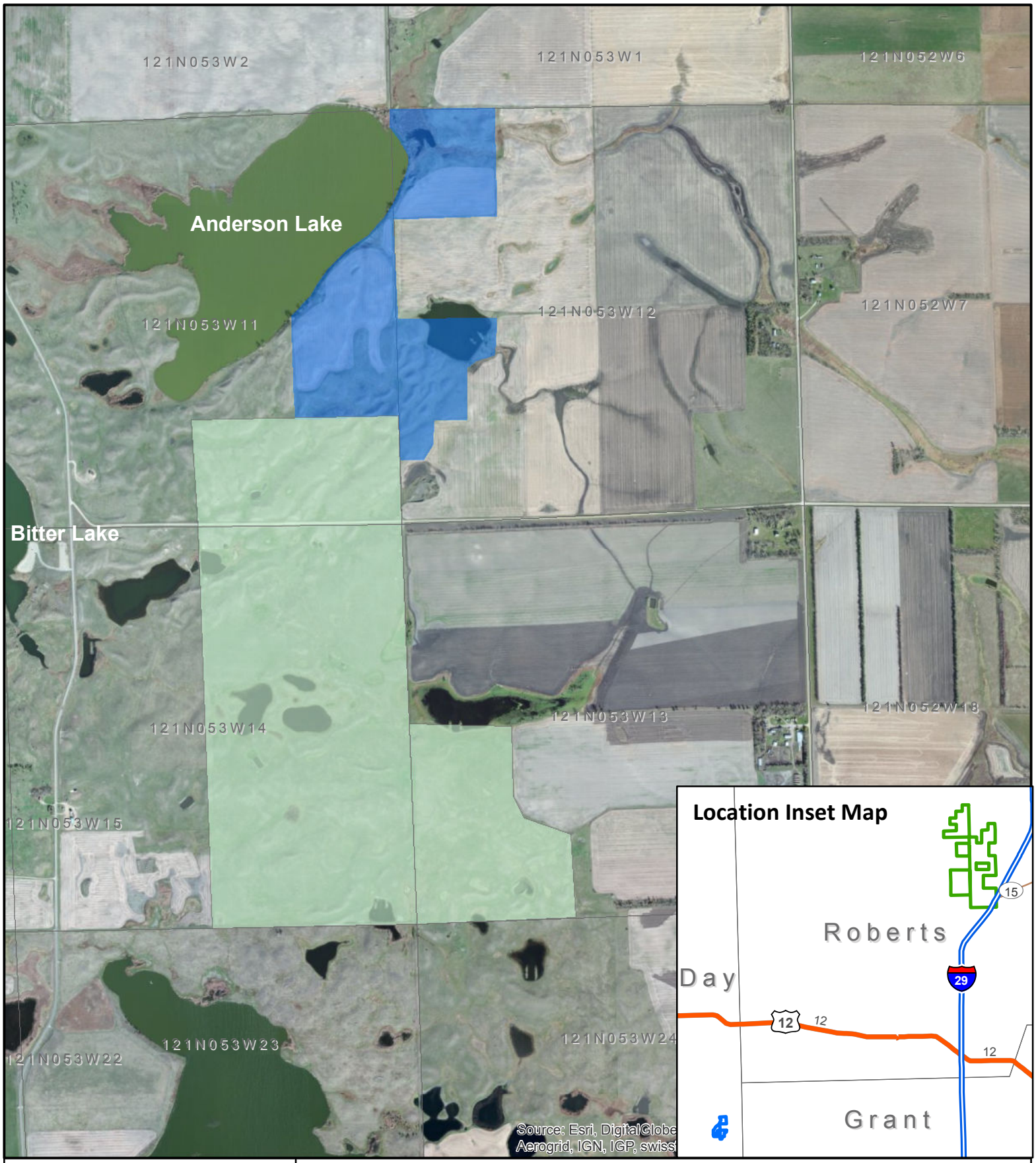
DATE REGISTRATION NO.

NORTHERN WIND
GI-0723
ONE LINE DIAGRAM

CHECKED
DATE
DRAWN JKC
DATE 11/12/10

SCALE NONE
W.O. NO.
MAP NO.
DWG. NO. NW-OL-01RA

Figure 6: Proposed Mitigation Acres Location Map



Northern Wind, LLC

Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 6: Proposed Mitigation Acres Location Map

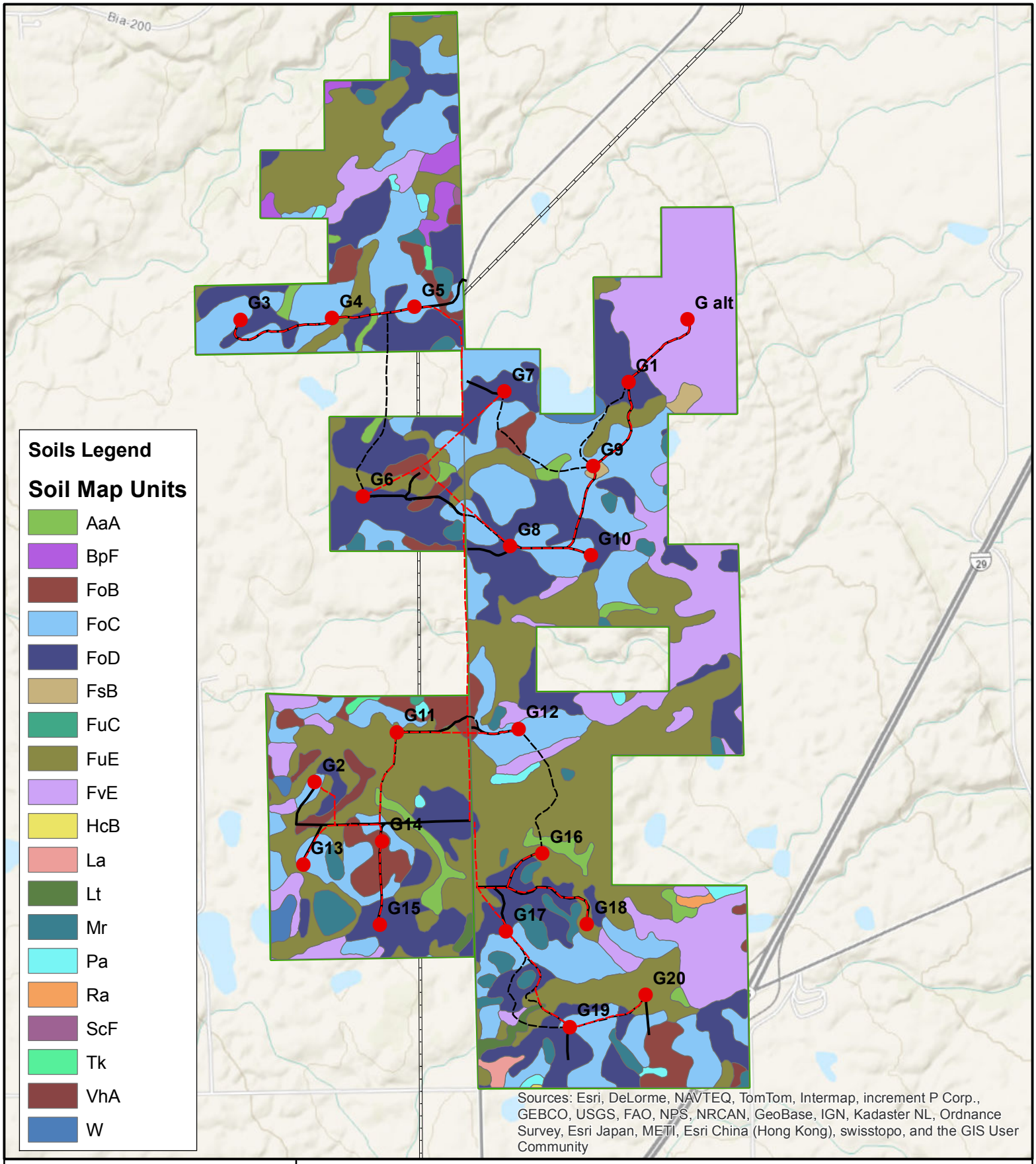
- Proposed Mitigation Acres
- FWS Existing Grassland Easements
- Northern Wind Project Area
- PLSS Section Boundaries

N

1:20,000

0 0.25 0.5 1 M

Figure 7: Northern Wind Soils Unit Map



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: MP
June 2014

Figure 7: Northern Wind Soils Unit Map

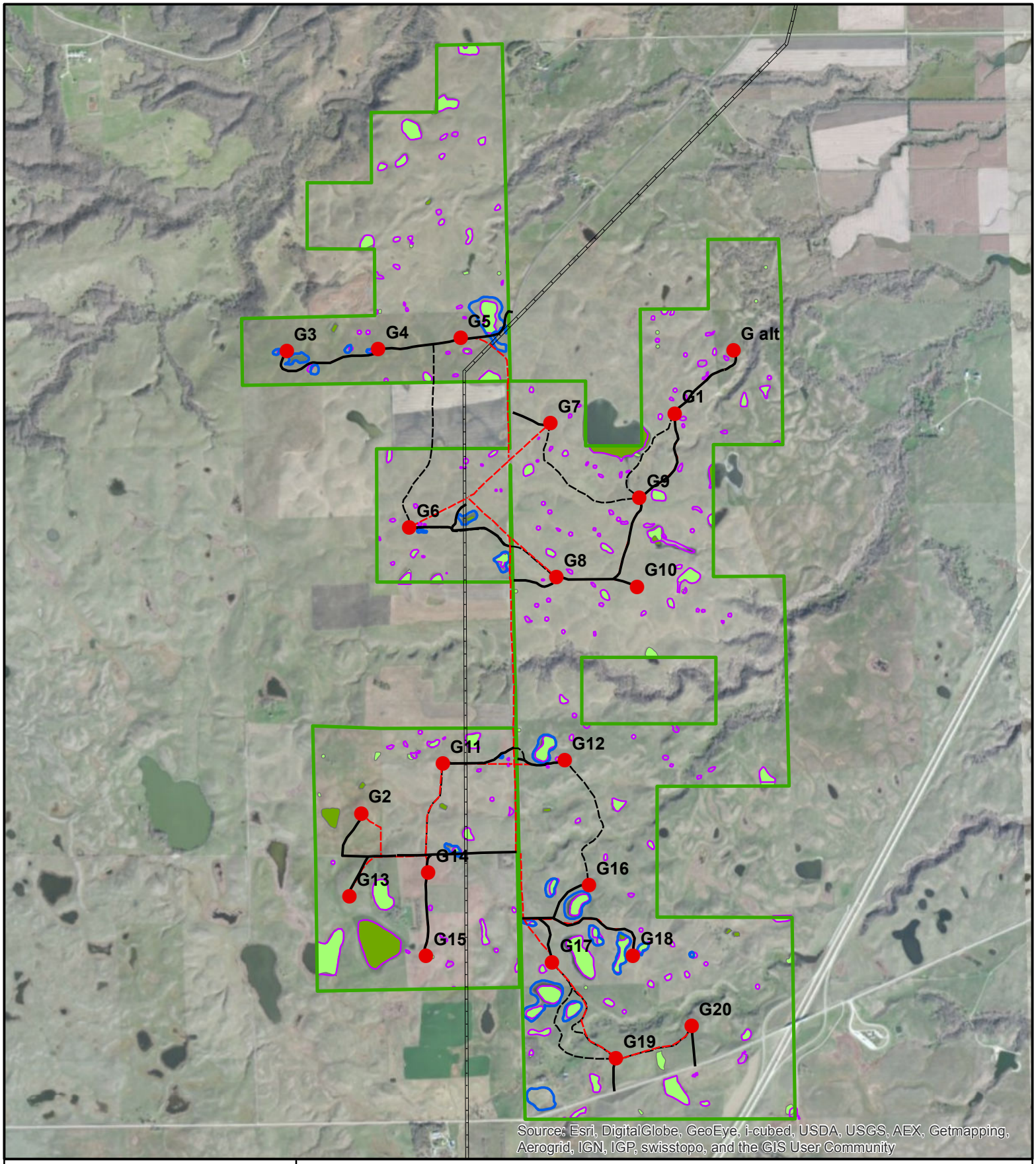
Tubine Locations
Northern Wind Project Area
Collection Lines
115 kV line
Crane Paths
Access Roads

N

1:30,000

0 0.25 0.5 1 Miles

Figure 8: Northern Wind Wetlands Map



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 8: Northern Wind Wetland Map

- Tubine Locations
- Roads June 2014
- Collection Lines
- Crane Paths
- 115 kV line
- Northern Wind Project Area
- Delineated Wetlands
- USFWS Wetland Easements

National Wetland Inventory

- Freshwater Emergent Wetland
- Freshwater Pond

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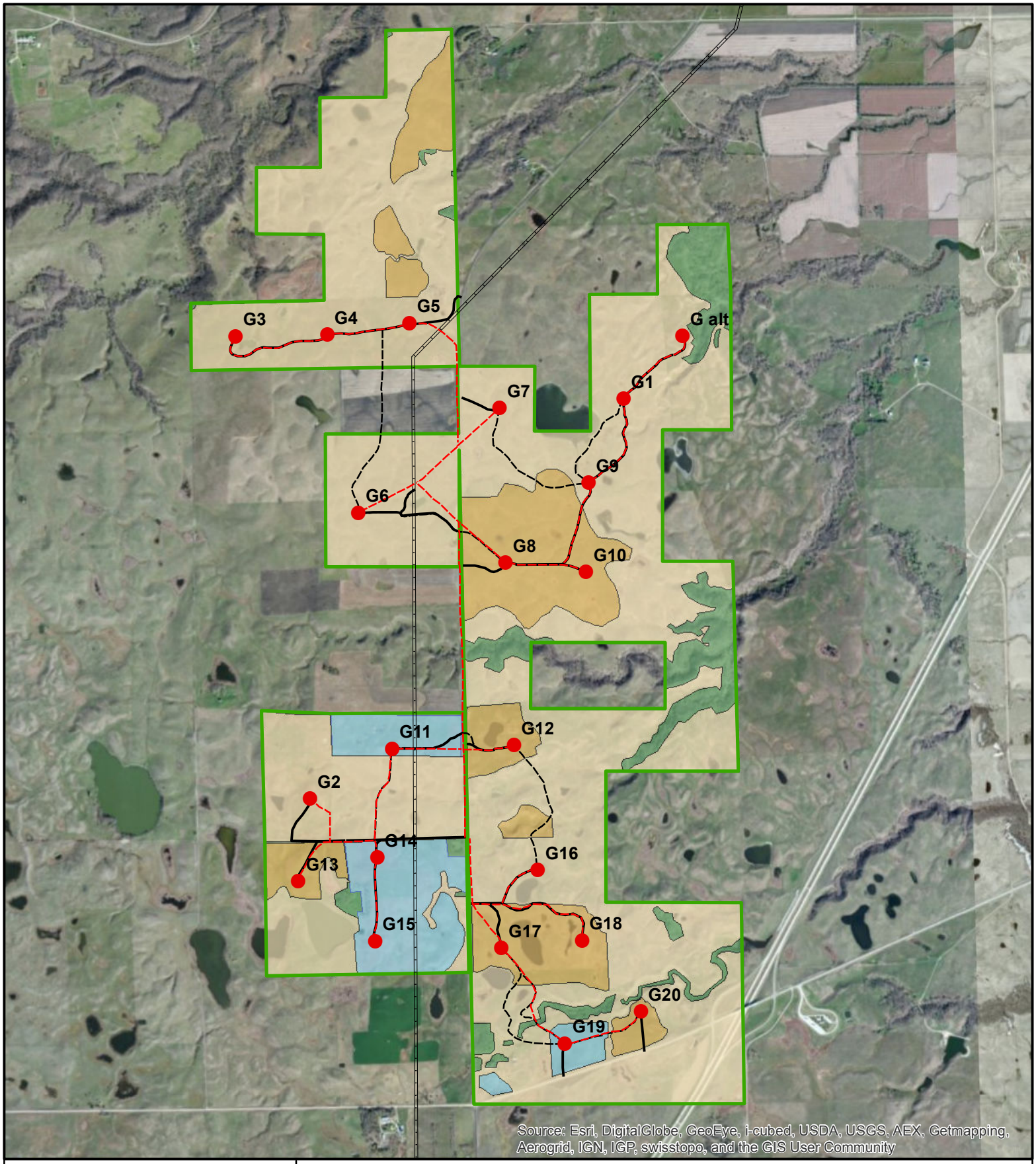
0 0.25 0.5 1 Miles

Figure 9: Land Cover Map



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 9: Land Cover Map

Land Cover
- CRP
- Forested
- Historically Tilled
- Native Prairie

- Tubine Locations
- Collection Lines
- Crane Paths
- Access Roads
- 115 kV line

- Northern Wind Project Area

N

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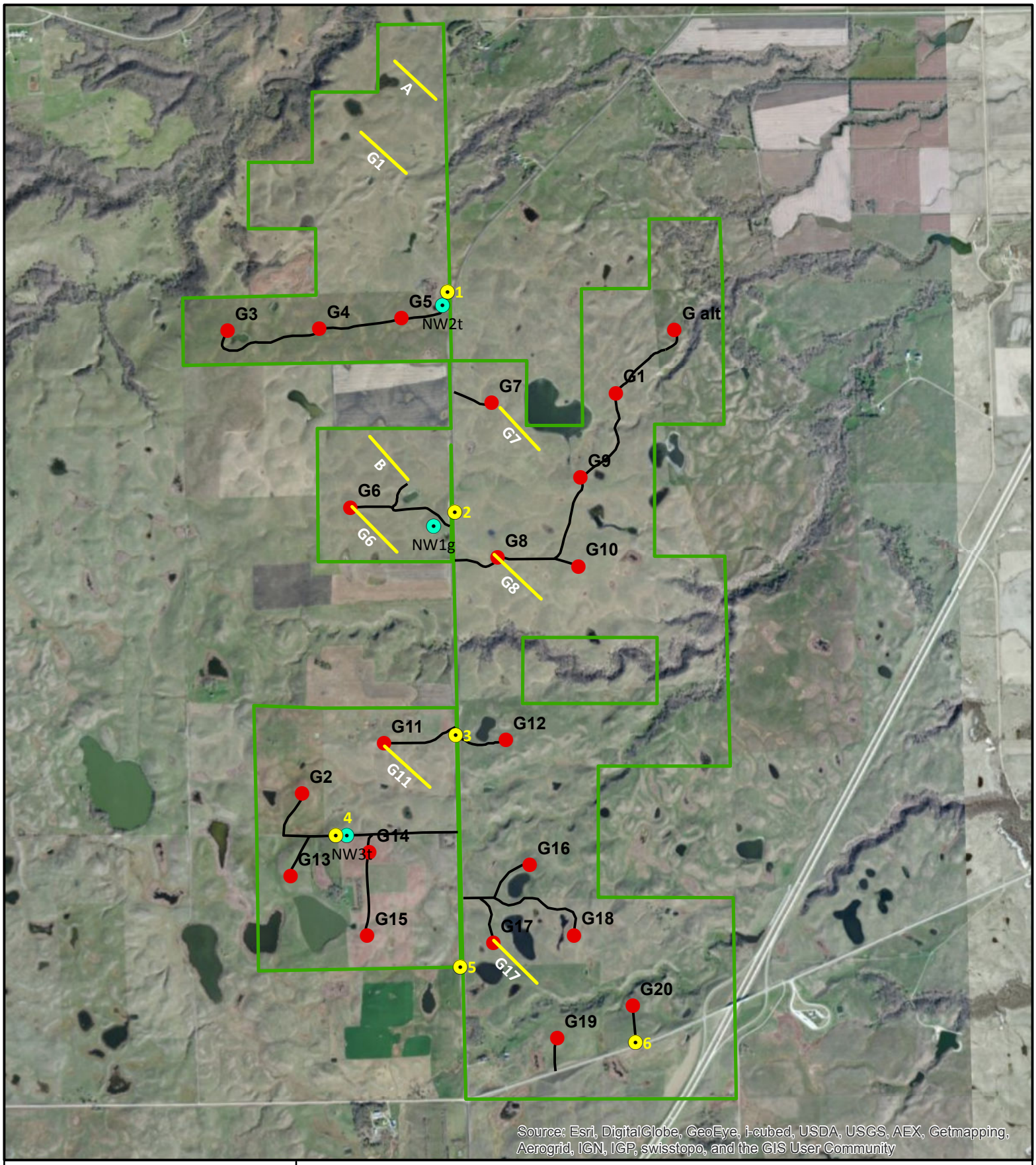
0 0.25 0.5 1 Miles

Figure 10: Locations of Avian Studies and Bat Studies



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 10: Locations of Avian Studies and Bat Studies

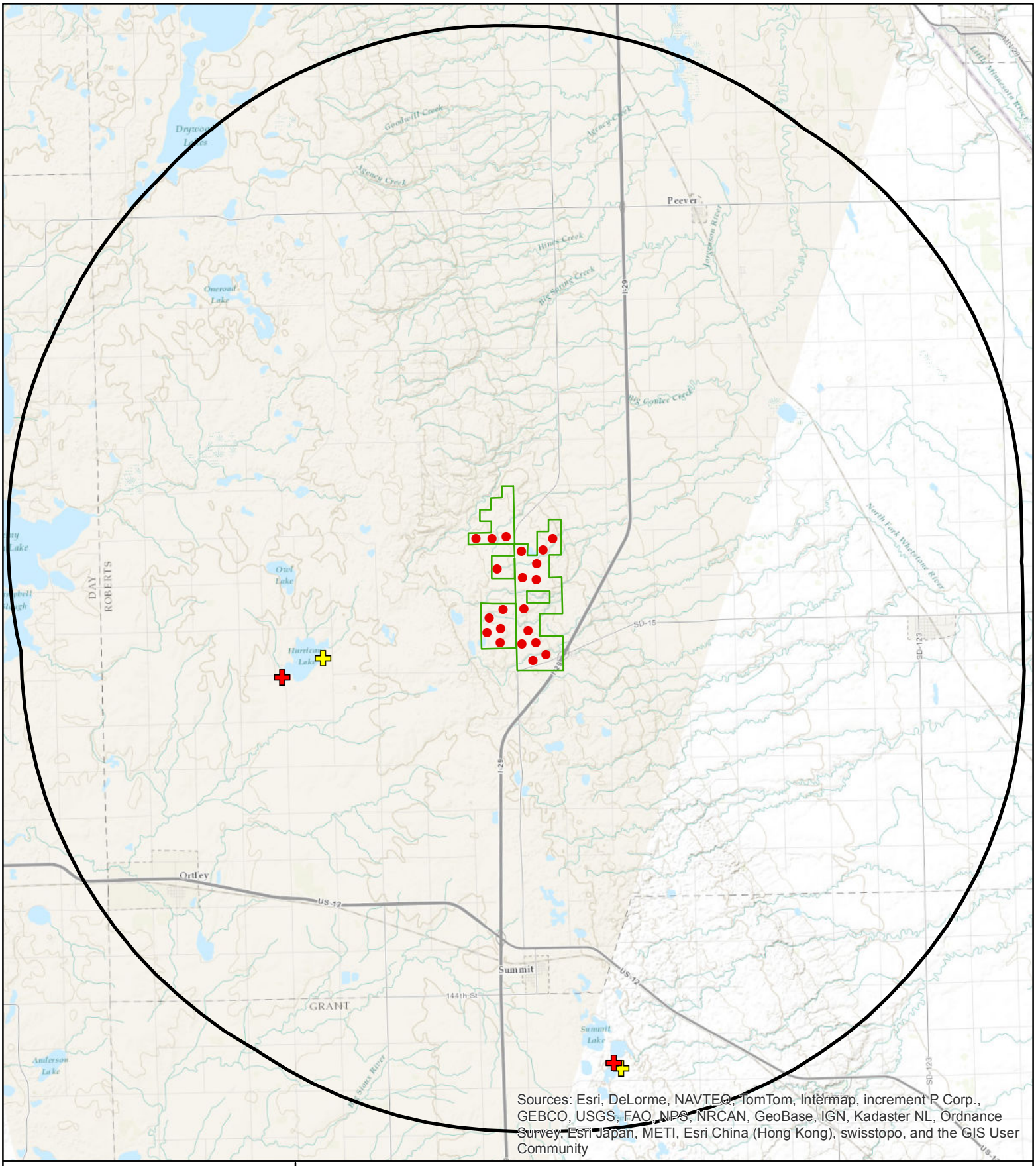
- Avian Study Transect
- Avain Study Point Count Location
- Anabat Locations
- Tubine Locations
- Access Roads
- Northern Wind Project Area

N

1:30,000

0 0.25 0.5 1 Miles

Figure 11: Bald Eagle Survey Map and Nest Locations



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: RP
June 2014

Figure 11: Bald Eagle Survey Area and Nest Locations

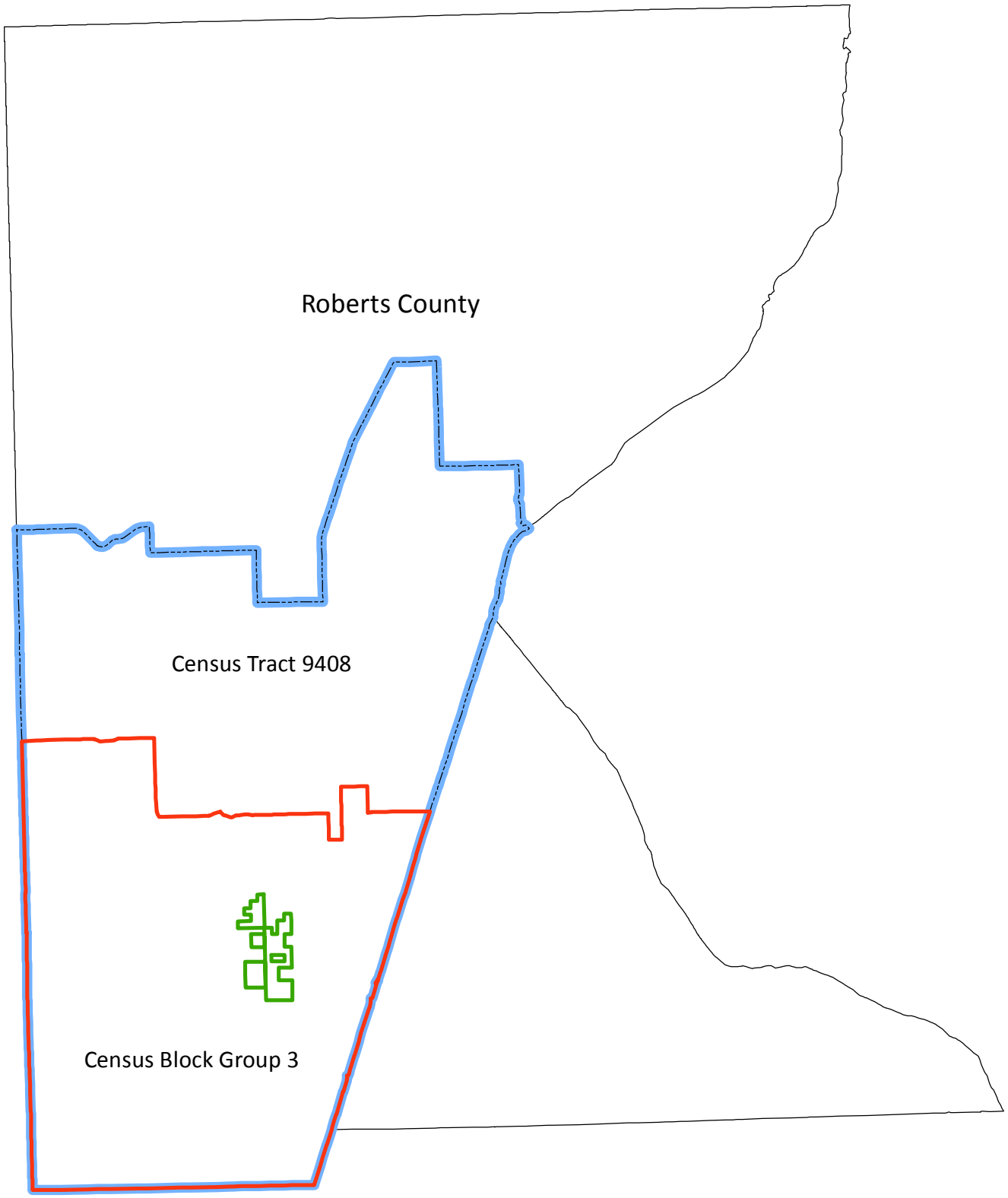
Bald Eagle Nests
- Occupied Nest
- Unoccupied Nest
- 10 Mile Radius of Project Boundary
- Tubine Locations
- Project Area

N

1:175,000

0 1.5 3 6 Miles

Figure 12: US Census Tracts



Northern Wind, LLC
Northern Wind Resource Area
Roberts County, South Dakota
June 2014

WCEC
ENVIRONMENTAL CONSULTANTS

WCEC Project 11-8335-20
Map Created by: MP
June 2014

Figure 11: Census Tract Levels

- Project Area
- Census Block Group
- Census Tract
- County

N

1:350,000

0 3 6 12 Miles

Appendix A: Summary of Public Scoping Meeting

Invitations:

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

B0403.BL

SEP 29 2011

Dear Customers and Interested Parties:

Western Area Power Administration (Western) is announcing the scoping period for the Northern Wind Project Environmental Assessment (EA). The Northern Wind Project (Project) involves the potential construction of an approximate 50-MW wind farm generating facility that includes 20 2.5 megawatt turbines, an underground power collection system, substation, access roads, and a maintenance and operation center. The Project will be located eight miles northwest of Summit, South Dakota. The 2,480 acre wind farm site legal description includes parts of Sections 9, 10, 15, 16, 21, 22, 27, and 28, Spring Grove Plat, Township 123N Range 51W, Roberts County, South Dakota (see enclosed maps). The proposed Project would interconnect with Western's Foreman-Summit 115-kV Transmission Line. Western is preparing an EA in order to comply with the National Environmental Policy Act (NEPA) which requires Western to take into account the environmental impacts that could result from an action. NEPA also requires that federal agencies seek public input on proposed projects

The wind farm is sited on land owned and leased by Whipple Ranch Incorporated. The land does include Conservation Reserve Program (CRP) contract lands as well as U.S. Fish and Wildlife Grassland and Wetland Easements. Wind turbines are anticipated to be installed on land with both CRP contracts and Grassland Easements. The land has traditionally been used for cattle grazing and, except for the contracted CRP land, will continue as grazing lands.

The scoping period provides an opportunity for the public and federal, state, local agencies, and tribal governments to identify issues or alternatives that help define the scope of the EA. The public scoping period begins on October 11, 2011, and ends on November 10, 2011. One public scoping meeting will be held to provide an opportunity for the public to submit scoping comments on the proposal in person, talk to staff working on the Project, and to speak with resource specialists. The scoping meeting will be held on October 13, 2011, between 5:00 p.m. and 8:00 p.m. at the Wilmot Community Center, 516 Main Street, Wilmot, South Dakota, 57279.

Comments will be accepted at the scoping meeting, by letter to me at the above address, or by e-mailing me at hanebury@wapa.gov. Please refer to the "Northern Wind Project" in your correspondence. Send all comments by close of business November 10, 2011.

Sincerely,

Louis R. Hanebury
Environmental Protection Specialist

Enclosures

First Name	Last Name	Job Title	Company/agency	Address 1	Address 2	City	State	Zip
Steve	Naylor	Regulatory Program Manager	U.S. Army Corps of Engineers, Omaha District	SD Regulatory Office	28563 Powerhouse Roadt	Pierre	SD	57501
James	Martin	Acting Regional Administrator	U.S. Environmental Protection Agency, Region 8		1595 Wynkoop St.	Denver	CO	80202-1129
Suzanne	Bohan	NEPA Program Director	U.S. Environmental Protection Agency, Region 8	NEPA Program	1595 Wynkoop St.	Denver	CO	80202-1129
Scott	Larson	Field Supervisor	U.S. Fish and Wildlife Service	South Dakota Field Office	420 S. Garfield Avenue, Suite 400	Pierre	SD	57501-5408
Brad	Johnson	Project Leader	U.S. Fish and Wildlife Service	Waubay Wetland Management District	44401 - 134A St.	Waubay	SD	57273
Tony	Jackson	Directr, External Affaris	U.S. Department of Agriculture	Farm Service Agency-Public Affairs Staff	1400 Independence Ave., SW, STOP 0506	Washington	DC	20250-0506
Gayle	Norman	Director, Public Affairs	U.S. Department of Agriculture	Natural Resources Conservation Service	1400 Independence Ave., SW, Room 6121-S	Washington	DC	20250
Scott	Barringer	Director	U.S. Department of Agriculture-Rural Utilities Service	Water and Environmental Program	1400 Independence Ave, SW, Rm 5145 STOP 1548	Washington	DC	20250-1548
Jeff	Wright	Director	Federal Energy Regulatory Commission	Office of Energy Projects	888 First Street, NE	Washington	DC	20426
John	Fowler	Executive Director	Advisory Council on Historic Preservation	Old Post Office Building	1100 Pennsylvania Avenue, NW, Suite 803	Washington	DC	20004
		Environmental & Historic Preservation	Federal Emergency Management Agency	Denver Federal Center	Building 710, Box 25267	Denver	CO	80225-0267
Barry	Cooper	Regional Administrator	U.S. Department of Transportation	Federal Aviation Administration-Great Lakes Region	O'Hare Lake Office Center, 2300 East Devon Avenue	Des Plaines	IL	60018
Willie	Taylor, Ph.D.	Director	U.S. Department of the Interior	Office of Environmental Policy and Compliance	1849 C. Street, NW, MS 2342	Washington	DC	20240
Robert	Stewart	Regional Environmental Officer	U.S. Department of the Interior	Denver Federal Center	P.O. Box 25007 (D-108)	Denver	CO	80225-0007
Max	Ethridge	Central Regional Director	U.S. Geological Survey Central Region	Denver Federal Center	Building 810, Mail Stop 150	Denver	CO	80225-0046
Walt	Bones	Secretary of Agriculture	South Dakota Department of Agriculture	Secretary of Agriculture	523 E Capitol Ave	Pierre	SD	57501-3182
Jeff	Vonk	Director	South Dakota Game, Fish and Parks Department		523 E Capitol Ave	Pierre	SD	57501-3182
Tim	Tollefsrud	Director Environmental Services	South Dakota Department of Environment and Natural Resources	Joe Foss Building	523 E Capitol Ave	Pierre	SD	57501-3182
Jeff	Senst	Region Engineer	South Dakota Department of Transportaion	Aberdeen Region	PO Box 1767	Aberdeen	SD	57402-1767
Gary	Hanson	Chairman	South Dakota Public Service Commission	Capitol Building	500 E Capitol Ave	Pierre	SD	57501-5070
Jay	Vogt	Director	South Dakota State Historical Society	State Historic Preservation Office	900 Governors Dr.	Pierre	SD	57501
Leroy	Laplante	Secretary	South Dakota Department of Tribal Relations		711 E Wells Ave	Pierre	SD	57501
Jarrod	Johnson	Commissioner	South Dakota School and Public Lands		500 E Capitol Ave	Pierre	SD	57501
Calvin	Thompson	Chairman	Roberts Conservation District	USDA Service Center	2018 SD Hwy 10	Sisseton	SD	57262
Dennis	Daugaard	Govenor	Office of the Govenor		500 E Capitol Ave	Pierre	SD	57501
Chris	Mxwell	Business Development	Govenors Office of Economic Development		711 E. Wells Avenue	Pierre	SD	57501-3369
John	Rohlf	Division Administrator	Federal Highway Administration	South Dakota Division	116 East Dakota Avenue, Suite A	Pierre	SD	57501
Janet	Oertly	State Conservationist	Natural Resources Conservation Service	South Dakota State Office	200 Fourth Street SW, Room 203	Huron	SD	57350
Craig	Schaunaman	State Executive Director	South Dakota State Farm Service Agency		200 4th St. SW	Huron	SD	57350-2431
Sharon	Rolstad	County Executive Director	Farm Service Agency	Roberts County Farm Service Agency	2018 E Hwy 10	Sisseton	SD	57262
Anthony	Reider	President	Flandreau Santee Sioux		P.O. Box 283	Flandreau	SD	57028-0283
Gabe	Prescott	President	Lower Sioux Indian Community of Minnesota		P.O. Box 308, 39458 Res. Highway 1	Morton	MN	56270
Victoria	Winfrey	President	Prairie Island Indian Community of Minnesota		5636 Sturgeon Lake Road	Welch	MN	55089
Roger	Trudell	Tribal Chairman	Santee Sioux Tribe of Nebraska		425 Frazier Ave. North, Suite 2	Niobrara	NE	68760
Robert	Shepherd	Tribal Chairman	Sisseton-Wahpeton Oyate		P.O. Box 509	Agency Village	SD	57262-0509
Roger	Yankton, Sr.	Tribal Chairperson	Spirit Lake Tribe		P.O. Box 359	Fort Totten	ND	58335
Kevin	Jensvold	Chairman	Upper Sioux Indian Community of Minnesota		P.O. Box 147	Granite Falls	MN	56241
Robert	Cournoyer	Chairperson	Yankton Sioux Tribe		P.O. Box 248	Marty	SD	57361
Roger	George	Chairman	Roberts County Commission	Roberts County Courthouse	411 2nd Avenue E	Sisseton	SD	57262
Tim	Zempel	Vice Chairman	Roberts County Commission	Roberts County Courthouse	411 2nd Avenue E	Sisseton	SD	57262
Robert	Horton	Commissioner	Roberts County Commission	Roberts County Courthouse	411 2nd Avenue E	Sisseton	SD	57262
Glen	Hull	Commissioner	Roberts County Commission	Roberts County Courthouse	411 2nd Avenue E	Sisseton	SD	57262
Roger	Navratil	Commissioner	Roberts County Commission	Roberts County Courthouse	411 2nd Avenue E	Sisseton	SD	57262
Tim	Johnson	U.S. Senator	United States Senate		530 Hart Senate Office Building	Washington	DC	20510
John	Thune	U.S. Senator	United States Senate		511 Dirksen Senate Office Building	Washington	DC	20510
Kristi	Noem	Congresswoman	United States House of Representatives		226 Cannon House Office Building	Washington	DC	20515
David	Sigdestad	Representative	South Dakota House of Representatives	District 1	42449 133rd Street	Pierpont	SD	57468-5114
Susan	Wismer	Representative	South Dakota House of Representatives	District 1	PO Box 147	Britton	SD	57430
Jason	Frerichs	Senator	South Dakota Senate	District 1	13497 465th Ave	Wilmont	SD	57279-8027
Bob	Paulson	Western Dakotas Program Director	The Nature Conservancy	Western Dakotas Program	822 Main Street	Rapid City	SD	57701
Jim	Heisinger	Chairperson	Sierra Club	South Dakota Office	PO Box 1624	Rapid City	SD	57709-1624
Jerry	Schlekeway	President	Izaak Walton League of America	South Dakota Division	Stoney Point 728 S. Lake Drive	Watertown	SD	57201
Nancy	Hilding	President	Prairie-Hills Audubon Society		P.O. Box 788	Black Hawk	SD	57718
Kelly	Fuller	Wind Campaign Coordinator	American Bird Conservancy		1731 Connecticut Ave. NW, Third Floor	Washington	DC	20009
Steve	Adair	Regional Director	Ducks Unlimited	Great Plains Regional Office	2525 River Road	Bismarck	ND	58593-9011
			Pheasants Forever, Inc.	Chapter # 379 - Roberts County	1783 Buerkle Circle	St. Paul	MN	55110

B0403.BL

OCT 05 2011

The Honorable Robert Cournoyer
Chairperson
Yankton Sioux Tribe
P.O. Box 248
Marty, SD 57361

Dear Chairperson Cournoyer:

Western Area Power Administration (Western), a power-marketing agency of the Department of Energy, has received a request from Northern Wind LLC to interconnect the proposed Northern Wind Project with Western's Forman-Summit 115-kV Transmission Line (Project). The purpose of this letter is to inform you of this proposed Project, provide notice that Western will prepare an Environmental Assessment (EA) for the proposed Project, initiate government-to-government consultation, and invite your participation in the environmental review and National Historic Preservation Act Section 106 consultation process. The information presented in this letter includes a brief Project description and enclosed maps. Additional information will continue to be provided to you and designated tribal departments or staff as it becomes available.

The proposed Northern Wind Project involves the construction of an approximate 50-MW wind generating facility that includes 20 2.5 megawatt turbines, an underground power collection system, substation, access roads, and a maintenance and operation center. The Northern Wind Project will be located eight miles northwest of Summit, South Dakota. The 2,480 acre wind facility legal description includes parts of Sections 9, 10, 15, 16, 21, 22, 27, and 28, Spring Grove Plat, Township 123N Range 51W, Roberts County, South Dakota (see enclosed maps). The wind facility will be sited on land owned and leased by Whipple Ranch Incorporated. The land does include Conservation Reserve Program (CRP) contract lands as well as U.S. Fish and Wildlife Grassland and Wetland Easements. Wind turbines are anticipated to be installed on land with both CRP contracts and Grassland Easements. The land has traditionally been used for cattle grazing and, except for the contracted CRP land, will continue as grazing lands.

An interconnection with Western is considered a "major Federal action" under the Department of Energy's National Environmental Policy Act (NEPA) implementing regulations. Western is preparing an EA in order to comply with NEPA, which requires Western to take into account the environmental impacts that could result from an action. It is our understanding that there may be important cultural and natural resources, and/or places with traditional cultural significance for your Tribe within the area that may be impacted by the proposed Project. At this time, we would appreciate receiving any information you would be willing to share with us on any unique, special, ethnographic, or archaeological resources or areas in or near the proposed Project.

Additionally, we would also like to inform your Tribe of an upcoming public scoping meeting. The scoping period provides an opportunity for the public and federal, state, local agencies, and tribal governments to identify issues or alternatives that help define the scope of the EA. The public scoping period begins on October 11, 2011, and ends on November 10, 2011. One public scoping meeting will be held to provide an opportunity for the public to submit scoping comments on the Northern Wind Project in person, talk to staff working on the project, and to speak with resource specialists. The scoping meeting will be held on October 13, 2011, from 5:00 p.m. to 8:00 p.m. at the Wilmot Community Center, 516 Main Street, Wilmot, South Dakota.

The public scoping meeting is not in lieu of our government-to-government relationship. Western will provide a separate opportunity for consultation with your Tribe concerning the Northern Wind Project.

For questions related to the Project, please contact Western's staff Steve Tromly toll-free at (800) 366-7549 or email tromly@wapa.gov, or Lou Hanebury at (406) 255-2812 or email hanebury@wapa.gov.

I look forward to working with you as this process moves forward.

Sincerely,

/S/ Matt Marsh

Nicholas J. Stas
Environmental Manager

Enclosures

bcc:
S. Tromly, A7400, Lakewood, CO
M. Schriner, A7400, Lakewood, CO
B0403.BL

B0403.BL:lrh:db:10/5/11:R:\Groups\Environmental\Letters to Customers\Draft Northern Wind Initial Tribal Consult 10-4-11.docx

Newspaper and Radio Ad:

Public Notice – Advertising Media

The following media have been engaged to deliver public service announcements for the Northern Wind "Public Scoping Meeting" to be held October 13, 2011:

Media Name	Media Type	Location	Frequency of Notice	Additional Details	Dates
Public Opinion	Newspaper	Watertown, SD	1x Weekly	In legals section	September 26 & October 3
Three Eagles	Radio Station Network	Watertown, SD	3 x per day, 5 days/week, Two weeks	On two radio stations: KWAT & KDLO	Sept. 26-30, Oct. 3-7
Enterprise	Newspaper	Wilmot, SD	1x Weekly	Advertisement	Sept. 22, 29
Pheasant Country	Local Radio Station	Tower: Eden, SD	10x per day, 2 week span	With hourly weather	Sept. 26, 28, 30; and Oct. 11, 12, 13

Each media outlet shall provide a statement / affidavit documenting the dates/times of message delivery as appropriate to communication method associated with each.

Newspaper Advertisement / public Notice

Northern Wind – WCEC Project No. 8335

Public Input Encouraged!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility in Roberts County, west of Wilmot and north of Summit, South Dakota. The proposed project, to be called Northern Wind, will include 20 wind turbine generators and the associated access roads and underground power collection system. An operations and maintenance facility will also be part of this project. The project will be located entirely within the Whipple Ranch in Spring Grove Township. Construction of the Northern Wind energy project is proposed to begin in May 2013.

Western Area Power Administration will hold a public scoping meeting to define the scope of the Northern Wind Environmental Assessment. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:

5 to 8 pm Thursday, October 13, 2011

Wilmot Community Center

516 Main Street, Wilmot SD 57279

For more information about the proposed project or to be added to the project mailing list, please contact:

Lou Hanebury, Environmental Protection Specialist

Western Area Power Administration

P.O. Box 35800

Billings, MT 59107-5800

PHONE: (800) 358-3415, FAX: (406) 255-2900

eMail: hanebury@wapa.gov

Watertown Public Opinion
AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF CODINGTON } ss

Mark S. Roby, being duly sworn says: That Watertown Public Opinion is, and during all the times hereafter mentioned was, a daily legal newspaper as defined in SDCL 17-2-2.1 through 17-2-2.4, as amended, published at Watertown, Codington County, South Dakota, by Watertown Public Opinion; that affiant is and during all of said times was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is attached, was published in said newspaper upon:

Monday, the 26th day of September 2011,

Monday, the 3rd day of October 2011,

that the full amount of the fee charged for publishing the same, including a $5.00 affidavit fee, to-wit, the sum of $65.14 insures solely to the benefit of the publisher of said newspaper; that no agreement or understanding for the division of the fee has been made with any person, and that no part of the fee has been agreed to be paid to any other person.

Subscribed and sworn to before me this 3rd day of October, A.D. 2011.

(Seal) Notary Public, South Dakota

My commission expires June 28, 2017

NOTICE OF PUBLIC HEARING

Public Input Encouraged

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility in Roberts County, west of Wilmot and north of Summit, South Dakota. The proposed project, to be called Northern Wind, will include 20 wind turbine generators and the associated access roads and underground power collection system. An operations and maintenance facility will also be part of this project. The project will be located entirely within the Whipple Ranch in Spring Grove Township. Construction of the Northern Wind energy project is proposed to begin in May 2013.

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5 to 8 pm Thursday, October 13, 2011
Wilmot Community Center
516 Main Street, Wilmot SD 57279

For more information about the proposed project or to be added to the project mailing list, please contact:

Lou Hanebury, Environmental Protection Specialist
Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800
PHONE: (800) 358-3415,
FAX: (406) 255-2900
eMail: hanebury@wapa.gov

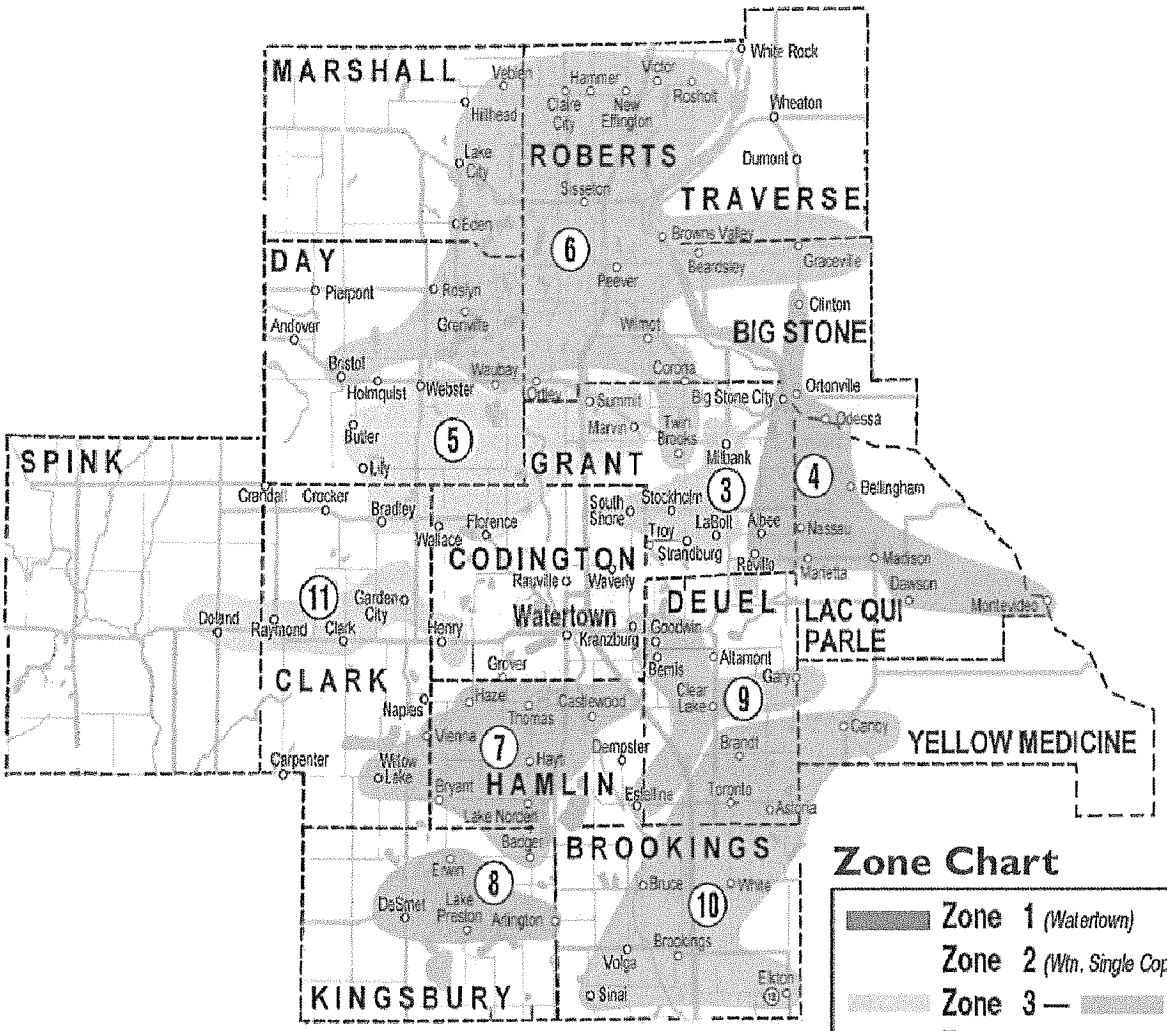
Published twice at the total approximate cost of $62.75. (September 26, 2011 and October 3, 2011)

9 C.S. 14

All legal notices in the Public Opinion and other South Dakota newspapers can be found at www.sdpublicnotices.com

Readership Area

Watertown PUBLIC OPINION



Zone Chart

- Zone 1 *(Watertown)*
- Zone 2 *(Wtn. Single Copy)*
- Zone 3 — Zone 4
- Zone 5 — Zone 6
- Zone 7 — Zone 8
- Zone 9 — Zone 10
- Zone 11
- Zone 12 *(Second Run Mail)*
- Zone 14 *(All Mail Singles)*

Target Audiences

- The *Watertown Public Opinion* reaches nearly 70 percent of the households in Watertown and Codington County.
- Overall, the *Watertown Public Opinion* reaches over 30,000 readers per day, Monday through Saturday, including more than 3,000 visitors daily to its website, *www.thepublicopinion.com*.
- Watertown and 75 communities in Northeastern South Dakota and West Central Minnesota receive the newspaper in the afternoon the same day it is published.
- 53 towns, including Watertown, have same-day carrier delivery and represent over 80 percent of our newspaper's circulation.

Radio AD:

Western Area Power Association invites you to attend a public scoping meeting, to help define the scope of an Environmental Assessment of Northern Wind, a proposed wind energy project in Roberts County, South Dakota.

The proposed project will include 20 wind turbine generators, an underground power collection system, access roads, and a maintenance and operation center. Construction of the Northern Wind energy project is proposed to begin in May 2013.

The public meeting will be held Thursday, October 13th from 5 to 8 PM at Wilmot Community Center. For more information, please call Lou Hanebury at 1-800-358-3415.

Meeting Sign-In Sheets and Comment Form:

Northern Wind
Environmental Assessment
Scoping Meeting

October 13, 2011 – Wilmot, South Dakota

Western AREA POWER ADMINISTRATION

- Please Print -

First	Last	Street/PO Address, City, State, Zip	Email	Organization
Richard	Roder	CONFIDENTIAL		
Don + June	Backman			
Don	German			
alvin	German			
Diana	Whipple			
Dave	Bonzaubach			
Nancy	Kimmel			
Kent	Good			

Northern Wind
Environmental Assessment
Scoping Meeting

October 13, 2011 – Wilmot, South Dakota

Western AREA POWER ADMINISTRATION

- Please Print -

First	Last	Street/PO Address, City, State, Zip	Email	Organization
Dixie	Hendrick			
Linda	Simmons			
Doris	Schocker			
Allyn	Swanson			

CONFIDENTIAL

Northern Wind Farm
Northern Wind, LLC
Public Scoping Meeting
October 13, 2011

Comment Form

Western needs your input on the Northern Wind, LLC Northern Wind Farm Environmental Assessment (EA).

If you have any issues, concerns, or questions that you would like discussed in Northern Wind's EA, please complete this response sheet, fold it in thirds with the return address showing, tape it closed, and drop it in the mail to us. If you prefer, you can also give us a call at (406) 255-2812.

Please tell us about the issues, concerns, or questions you want answered in the space provided below and attach additional sheets, if necessary.

Share your issues, concerns, or questions with us:

- OVER -

Tell us how to reach you

Please give us your name, address, phone, fax, and email, so we may keep you up to date about this project, if you wish.

Name: _____ Title: _____

Mailing address: _____

City, State, ZIP: _____

Phone: _____ Fax: _____ E-mail: _____

Check this box if you DO NOT wish to be on the project mailing list: ☐

Sign up to receive the Draft EA for Pre-Approval Review

Please let us know if and how you would like to receive a copy of the Draft Environmental Assessment when it is available by checking the appropriate box, below. We will also make the document available on Western's Web site (www.wapa.gov).

Send me the draft EA in the mail.

Send me the draft EA by email (include email address in contact info above).

I don't need a copy of the draft EA.

Contact us

For more information, contact Mr. Lou Hanebury, Western Area Power Administration
Phone: (406) 255-2812, E-mail: Hanebury@wapa.gov

Fold Here for Mailing

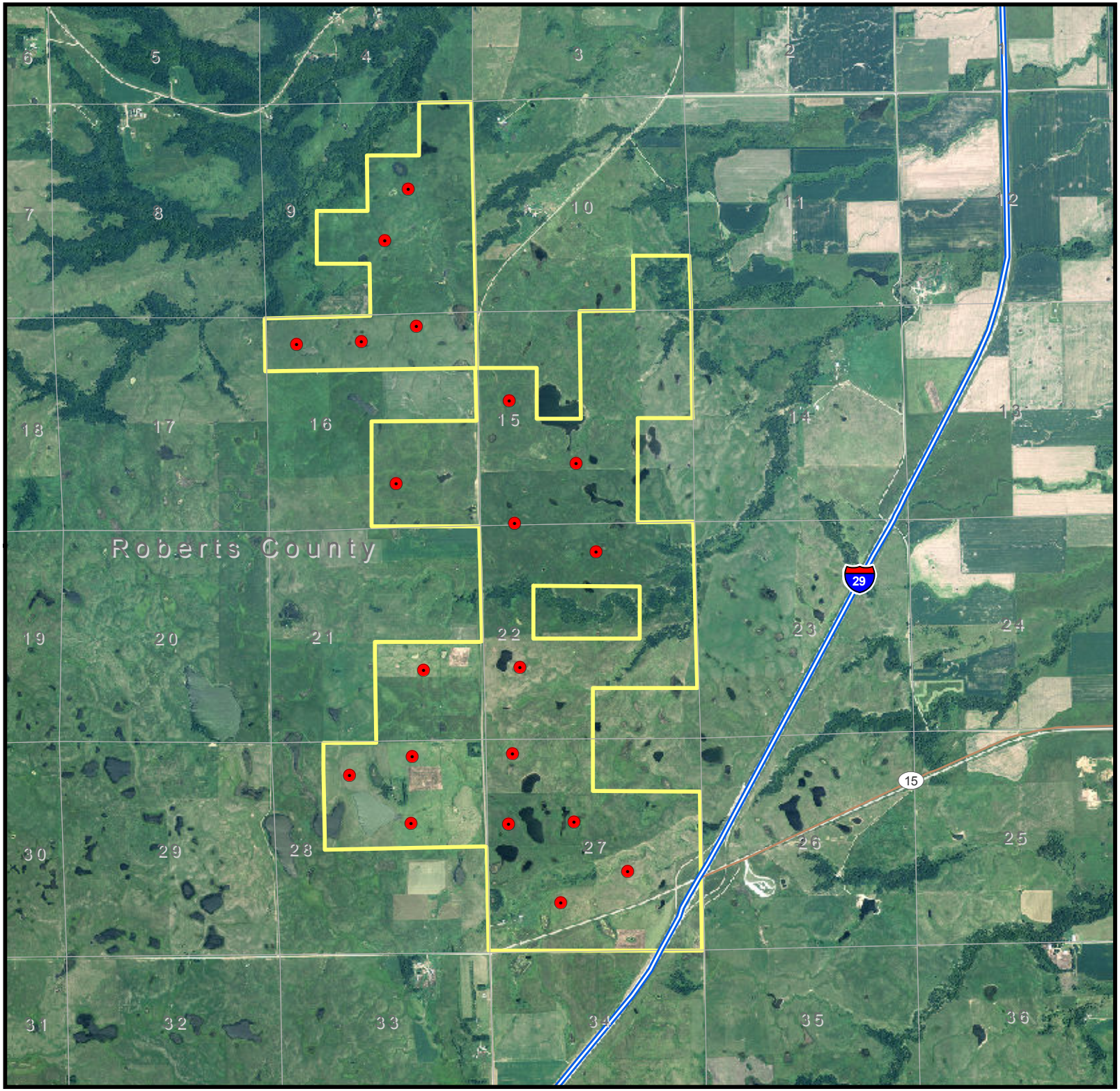
_____
_____
_____
_____

Place Stamp Here

Mr. Lou Hanebury
Western Area Power Administration
2900 4th Ave. North, Sixth Floor
Billings, MT. 59101

Tape Here – Do Not Staple

Project Map:



Northern Wind Resource Vicinity Map

Roberts County South Dakota

Public Scoping Meeting October 13, 2011

Legend

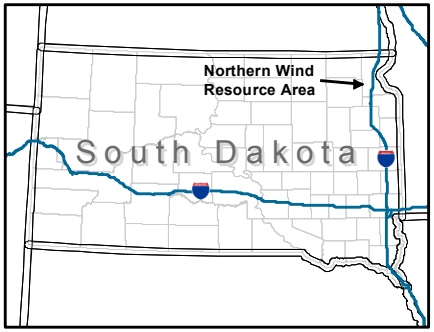
- Northern Wind Resource Area
- Interstate
- Highway
- Turbine Site (9/11/2011)
- PLSS Section Boundaries

0 0.5 1 Miles

Map Source:
Basemap - 2010 Aerial Photo
Project Layout Provided by ARES
Created by: WCEC, Rob Peterson
10/3/2011

N

Site Location Map



Meeting Photos:


WCEC


WCEC

Appendix B: Agency Correspondence and Public Comments

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

October 24, 2011

Louis R. Hanebury
Department of Energy
Western Area Power Administration
Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Re: Northern Wind Project, Roberts County, South Dakota

Dear Mr. Hanebury:

This letter is in response to your September 29, 2011, announcement of a scoping period as your agency develops an Environmental Assessment regarding the above referenced Northern Wind Project; a proposed 50-megawatt (MW) wind energy development on 2,480 acres that includes establishment of 20 2.5 MW turbines, an underground power collection system, a substation, numerous access roads, and a maintenance/operation center. The project is proposed within portions of Sections 9, 10, 15, 16, 21, 22, 27, and 28, Township 123 North, Range 51 West, Roberts County, South Dakota.

Herein we provide information regarding important wildlife habitats and U.S. Fish and Wildlife Service (Service) trust resources, including federally listed species, eagles, birds of conservation concern, and other migratory birds that may occur on the project area. We have included recommended measures to be applied to various components of a wind farm, including meteorological towers, power lines, and the turbines themselves in order to minimize impacts to Service trust resources and to assist the development company in achieving compliance with Federal laws. We have also provided contact details for U.S. Geological Survey (USGS) and South Dakota Department of Game, Fish and Parks (SDDGFP) personnel so that further pertinent information for this project may be obtained.

U.S. Fish and Wildlife Service Land Interests

Per our previous communications relative to this project, you have already contacted the Service's Waubay National Wildlife Refuge Complex regarding Service land interests, including wetland/grassland easements and Waterfowl Production Areas in the area; we encourage continued close coordination with that office to determine potential impacts to those properties.

Threatened/Endangered Species

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Western prairie fringed orchid (*Platanthera praeclara*)	Threatened	Possible habitat, no recent specimens.

Additionally, the following candidate species may occur in the area:

Dakota skipper (*Hesperia dacotae*)	Candidate	Resident in northeastern South Dakota.

Western prairie fringed orchid: The Western prairie fringed orchid has not recently been documented in South Dakota; however, the life cycle of the plant often makes it difficult to detect. Populations currently exist in the neighboring states of Nebraska, Iowa, Minnesota, and North Dakota, and potential habitat may still be found in South Dakota. Although the plant is typically associated with intact native prairie, the Western prairie fringed orchid has also been found on disturbed sites. Potential habitats generally include mesic upland prairies, wet prairies, sedge meadows, subirrigated prairies, and swales in sand dune complexes. If these habitats exist within the proposed project area, surveys for the Western prairie fringed orchid should be considered prior to construction.

Dakota skipper: The Dakota skipper is a candidate species and, accordingly, is not at present provided Federal protection under the ESA. Their candidate status defines these butterflies as a species in decline that the Service believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. In South Dakota, they are found in Roberts County as well as Codington, Grant, Brookings, Brown, Day, Deuel, Edmunds, Hamlin, Marshall, and McPherson Counties. Dakota skippers are obligate residents of high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. In northeastern South Dakota, Dakota skippers inhabit dry-mesic hill prairies with abundant purple coneflower but also use mesic to wet-mesic tallgrass prairie habitats characterized by wood lily and smooth camas. Avoidance of these habitats within the proposed project area would likely preclude Dakota skipper impacts.

If the Western Area Power Administration (or their designated representative) determines that the project "may adversely affect" listed species in South Dakota, formal consultation with this office under section 7 of the ESA is required. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary; however, a copy of the determination should be sent to this office.

Wetlands

According to National Wetlands Inventory maps (available online at: http://wetlands.fws.gov/), numerous wetlands exist within the proposed project area. If a project may impact wetlands or other important fish and wildlife habitats, the Service, in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible; then minimization of any adverse impacts; and finally, replacement of any lost acres; in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted and the methods of replacement should be prepared and submitted to the resource agencies for review.

Wind Turbine Guidelines

Among the Service's primary concerns regarding wind turbines are avian collision mortality, the loss of habitat, and habitat avoidance behaviors by wildlife, including federally listed species as indicated above. While there is still much to be learned regarding wind turbine-wildlife interactions, we do know that wind turbines can have adverse impacts on some species. Turbine location, spacing, aspect, lighting, size, and design are all potential factors related to the risk posed to resident and migratory wildlife as are the types of surrounding habitats, their use by various species of wildlife, landscape features, prey base, migration corridors, and behavioral patterns. Direct collision mortality is a concern as is loss of habitat caused by the footprint of the turbines and associated roads and structures, along with impacts that can occur with encroachment of invasive weeds as a result of these disturbances. Recent studies of grassland nesting birds have shown a tendency for avoidance of areas immediately surrounding turbines, causing indirect habitat loss as well. Currently, perhaps the best means of avoiding impacts to wildlife is to avoid placing wind farms within high wildlife use areas. Placement of turbines within existing cropland or other disturbed areas is recommended for this reason. If the proposed project is to be constructed, we request the results of any pre- and/or post-construction wildlife monitoring, including any incidental mortality detected.

In July 2003, the Service released a set of voluntary, interim guidelines for land-based wind energy projects to assist developers in avoiding, minimizing, and/or compensating effects to fish, wildlife, and their habitats. The guidelines stress the importance of proper evaluation of potential wind turbine development sites (via development of a Potential Impact Index score for the proposed site and a reference area), appropriate location and design of turbines and related facilities, and pre- and post-construction research and monitoring.

In March 2007, the Secretary of the Interior established the Wind Turbine Guidelines Advisory Committee (Committee) under the auspices of the Federal Advisory Committee Act to provide recommendations for the final guidelines. The Committee was comprised of a variety of stakeholders, including Federal, State, tribal, private industries, and conservation organizations. After years of deliberations, the Committee submitted their final recommendations to the Secretary on March 4, 2010.

The Service then convened an internal working group representing several Service programs to review the Committee's recommendations. The working group used the recommendations as a basis to develop the Service's current Land Based Wind Energy Guidelines. These draft, voluntary guidelines were announced and made available for public comment starting February 8, 2011. A revised version of these draft guidelines was then released for additional public comment until August 4, 2011 (see the following website: http://www.fws.gov/windenergy/). This version is not expected to be finalized until late fall 2011. Once the final guidelines are published, the Service will apply them immediately; however, the Service is adopting the Committee's recommendation to allow companies that are already in the process of developing a project to enter into the guidelines at the appropriate tier.

Meteorological Towers

Meteorological towers constructed in association with wind turbines are often similar in design to typical communication towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic for birds, particularly during inclement weather, as they enter the lighted area, become reluctant to leave it, and suffer mortality as they circle the structure and collide with the guy wires or the lattice tower itself. We recommend following the guidance set forth in *U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning,* found online at: http://www.fws.gov/habitatconservation/communicationtowers.html, to minimize the threat of avian mortality at these towers. Monitoring at these towers would provide insight to the effectiveness of the minimization measures. We request the results of any wildlife monitoring and any data obtained regarding wildlife mortality at towers associated with this project.

In order to obtain information on the usefulness of the communication towers guidelines in preventing birds strikes and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of any towers associated with the wind turbine project and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures cannot be implemented, please explain why they were not feasible. A Tower Site Evaluation Form is also available via the above communication towers website (http://www.fws.gov/habitatconservation/communicationtowers.html). If meteorological towers are to be constructed, please complete this form and forward it to our office.

Power Lines

Electrocution. The construction of additional overhead power lines associated with wind farms creates the threat of avian electrocution, particularly for raptors. Thousands of these birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled *Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006* has many good suggestions, including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of

wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at www.eei.org or by calling 1-800-334-5453.

Please note that utilizing just one of the "Suggested Practices . . ." methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increase the threat of raptor electrocutions. Perch guards placed on other poles have, in some cases, served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or to combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the "Suggested Practices . . ." publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird. Unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *Raptors at Risk* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at: http://www.edmlink.com/raptorvideo.htm.

Line Strikes. In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *Mitigating Bird Collisions With Power Lines: The State of the Art in 1994* which may be obtained by contacting the Edison Electric Institute at the same website and telephone number listed above. Please note that this document is currently being updated, and a new version is anticipated soon. While marking of power lines reduces line strike mortality, it does not preclude it entirely. Thus, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality.

Bald Eagles

Bald eagles (*Haliaeetus leucocephalus*) occur throughout South Dakota in all seasons, and new nests are appearing each year. While ESA protections for bald eagles have been removed, the species will continue to be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). These laws protect eagles from a variety of harmful actions and impacts. Our agency has developed guidance for the public regarding means to avoid take of the eagle under these laws. The *National Bald Eagle Management Guidelines* are available online at: http://www.fws.gov/migratorybirds/baldeagle.htm. We recommend reviewing these guidelines as they advise of circumstances where these laws may apply and assist in avoiding potential violations on future projects. Additionally, permit regulations have been published for eagles. These regulations may be found in the Federal Register (Volume 74, No. 175, Friday, September 11, 2009) online at: http://www.gpoaccess.gov/fr/index.html. Draft Eagle Conservation Plan Guidance has also been developed by the Service and made available for public comment. This document was developed to provide interpretive guidance in applying the regulatory permit standards as specified by the BGEPA and other Federal laws to wind energy projects. It is available at: http://www.fws.gov/windenergy/index.html.

Birds of Conservation Concern

The Migratory Birds Division of the Service has published *Birds of Conservation Concern* (BCC) *2008*, which may be found online at: http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf. This document is intended to identify species in need of coordinated and proactive conservation efforts among State, Federal, and private entities, with the goals of precluding future evaluation of these species for ESA protections and promoting/conserving long-term avian diversity. In accordance with Executive Order 13186 regarding migratory bird protection, we recommend avoidance, minimization, and finally compensation to reduce the impacts to species protected by the MBTA. Compliance with this law may be partially addressed in an Avian (and Bat) Protection Plan (APP) [see below]; however, a separate mitigation plan that specifically addresses direct and indirect take of birds during and after construction is also recommended.

A primary threat to many grassland species that occur in South Dakota is habitat loss and fragmentation. It appears that most of the proposed project area harbors intact, potentially native, grasslands that likely provide habitat for BCCs. Additionally, as mentioned above, numerous wetlands are interspersed within the project area, and forested coulees also fall within the project boundaries. The variety of habitats present suggests that this site may be a high-use area for numerous species. Placement of facilities within such areas should be avoided as they are likely to incur greater impacts to wildlife, particularly birds, than developments occurring on previously disturbed lands, such as crop fields. Thus, we encourage further examination of alternate locations for this wind development.

If the project must occur at this site, we strongly recommend development of mitigative/offsetting measures for this habitat and its associated wildlife prior to project development. These measures may include, but are not limited to, purchase of easements or fee title lands to conserve habitat in other areas.

Avian Protection Plans

As a means to address some avian issues, the Service has coordinated with the Avian Power Line Interaction Committee (APLIC) to develop guidelines to assist companies in formulating APPs. APPs are utility-specific and designed to reduce avian and operational risks that result from avian interactions with electric utility facilities, but they may be adapted to wind energy facilities as well and include consideration of bat species which are known to suffer mortality at wind farms. We encourage project developers to investigate the formulation of an APP for specific projects and perhaps generate APPs at the company level. The APP guidelines may be accessed at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html.

The Service has developed an online reporting system for mortalities. Instructions for our *Bird Fatality/Injury Reporting Program* may be found online at: http://www.aplic.org/USFWS_BirdFatality_FilerInstructions.pdf, and the reporting site itself is located online at: https://birdreport.fws.gov/. Migratory bird mortalities or injuries located by your company, contractors, or other individuals should be recorded to this online site within 30 days of discovery. Use of this reporting program will benefit migratory birds by increasing our tracking capability of activities impacting migratory birds. This program may be used to complement an APP.

Migratory Bird Treaty Act

Although adherence to the Service's recommendations will provide some protection for migratory birds, implementation of these measures alone will not remove any liability should violations of the law occur. The MBTA prohibits the taking, killing, possession, and transportation (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction or operation of a wind energy facility even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or APPs and to implement those measures prior to/during construction, operation, or similar activities.

U.S. Geological Survey Research

The USGS's Northern Prairie Wildlife Research Center in Jamestown, North Dakota, has initiated studies of avian responses to wind turbines in both North Dakota and South Dakota. Their research may be relevant to your project, depending on habitat within the project area. We recommend that you contact Ms. Jill Shaffer of the USGS's Northern Prairie Wildlife Research Center at (701) 253-5547 for more information and the possibility of participation in that research.

South Dakota Department of Game, Fish and Parks

State of South Dakota Wind Power Guidelines. Please note that the SDDGFP has coordinated with the South Dakota Public Utilities Commission (SDPUC) regarding distribution of SDDGFP's *Siting Guidelines for Wind Power Projects in South Dakota* to wind developers intending to construct projects within the state of South Dakota. You may wish to contact the SDPUC and/or the Wildlife Diversity Division of the SDDGFP in Pierre for more information. Contact information may be found on their respective websites: http://puc.sd.gov/ and http://www.sdgfp.info/Wildlife/Diversity/ index.htm. The guidelines themselves may be found online at: http://www.sdgfp.info/wildlife/ diversity/windpower.htm.

Bats. Bats are known to suffer mortality due to direct collisions with wind turbines, and it has been recently determined that many also die as a result of air pressure changes at the turbine blades that cause internal injuries. The SDDGFP has completed a State Management Plan for bats (see: http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx) and may be able to provide additional information and/or recommendations on bats relative to this project.

If you have not already done so, please contact Silka Kempema at the SDDGFP-Wildlife Division, Joe Foss Building, 523 East Capitol Avenue, Pierre, South Dakota 57501, Telephone No. (605) 773-2742, for more information regarding the above SDDGFP related issues and other concerns that fall under that agency's purview.

Summary

The following items are pertinent to the proposed project, and we recommend addressing these issues proactively if/when the project progresses:

- Service land interests.
- Impacts to listed and candidate species: Western prairie fringed orchid and Dakota skipper.
- Potential wetlands impacts.
- Existing guidelines for various project components:

    a) Wind farm siting.

b) Meteorological towers.

c) Overhead power lines.

- Bald eagle impacts (MBTA and BGEPA).
- Migratory bird impacts (MBTA), including BCC, with application of pre-/post-construction monitoring and mortality data, development of an APP, and application of additional mitigative/offsetting measures to be coordinated with and reported to the Service.
- USGS's avian/wind information and potential participation in their ongoing research.
- SDDGFP wind siting guidelines and bat issues.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments on this project. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Scott V. Larson
Field Supervisor
South Dakota Field Office

cc: USFWS/Waubay NWR; Waubay, SD
(Attention: Brad Johnson)
USGS/NPWRC; Jamestown, ND
(Attention: Jill Shaffer)
Secretary, SDDGFP; Pierre, SD
(Attention: Silka Kempema)

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Great Plains Regional Office
115 Fourth Avenue S.E., Suite 400
Aberdeen, South Dakota 57401

TAKE PRIDE IN AMERICA

OCT 0 7 2011

IN REPLY REFER TO:
DESCRM
MC-208

Louis R. Hanebury
Environmental Protection Specialist
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Dear Mr. Hanebury:

We received your letter regarding the proposed Northern Wind Project that involves the potential construction of an approximate 50-MW wind farm in Roberts County, South Dakota. We have considered the potential for both environmental damage and impacts to archaeological and Native American religious sites on lands held in trust by the Bureau of Indian Affairs, Great Plains Region. You should be aware, however, that Tribes or Tribal members may have lands in fee status near the site of interest. These lands would not necessarily be in our databases, and the Tribes should be contacted directly to ensure all concerns are recognized. We strongly recommend that your office contact and consult directly with the Sisseton-Wahpeton Oyate Tribal Historic Preservation Officer, Diane Desrosiers, in order to acquire their input concerning your project. The action considered has the following notification date and project location:

- September 29, 2011 "Northern Wind Project"

We have no environmental objections to this action, as long as the project complies with all pertinent laws and regulations. Questions regarding environmental opinions and conditions can be addressed to Jeffrey Davis, Environmental Protection Specialist, at (605) 226-7656.

We also find that the listed action will not affect cultural resources on Tribal or individual landholdings for which we are responsible. Methodologies for the treatment of cultural resources now known or yet to be discovered – particularly human remains – must nevertheless utilize the best available science in accordance with provisions of the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act of 1979 (as amended), and all other pertinent legislation and implementing regulations. Archaeological concerns can be addressed to Dr. Carson N. Murdy, Regional Archaeologist, at (605) 226-7656.

Sincerely,

Alice A. Harwood

Deputy Regional Director – Indian Services

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
South Dakota Field Office
310 Roundup Street
Belle Fourche, South Dakota 57717-1698
http://www.blm.gov/mt
605-892-7000

TAKE PRIDE® IN AMERICA

In Response
Reply to
1790

October 17, 2011

Louis R. Hanebury - Env. Prot. Spec.
DOE - Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

Dear Mr. Hanebury:

We have received notice of the scoping period for the Northern Wind Project Environmental Assessment, Roberts County, SD (ER-11-0927)

The Bureau of Land Management appreciates the opportunity to review and provide comment regarding ER 11-0927. However, the BLM has no jurisdiction or authority with respect to the project, the agency does not have expertise or information relevant to the project, nor does the agency intend to submit comments regarding the project.

If you have additional questions, contact Russ Pigors, Physical Scientist, at 605-892-7000.

Sincerely,

Marian Atkins, Field Manager
South Dakota Field Office

cc: Michael Hildner, BLM
cc: James Beaver, BLM
cc: Lisa Treichel, OEPC

From: "Deutsch, Rhonda - FSA, Sisseton, SD" <rhonda.deutsch@sd.usda.gov>
To: "hanebury@wapa.gov" <hanebury@wapa.gov>
CC: "Rolstad, Sharon - FSA, Sisseton, SD" <sharon.rolstad@sd.usda.gov>
Date: 11/1/2011 2:09 PM
Subject: Northern Wind Project Environmental Assessment

Dear Mr. Louis R. Hanebury,

Thank you for including us in your letter regarding the EA on the Northern Wind Project which would be located eight miles NW of Summit, SD. The project includes CRP acres. I would just like to explain the provisions regarding wind towers on CRP. Policy in 2-CRP Par. 639 states the following:

639 Wind Turbines

A Policy

COC may authorize the installation of windmills, wind turbines, wind-monitoring towers, or other wind-powered generation equipment on CRP acreage on a case-by-case basis. COC may approve up to 5.0 acres per contract of wind turbines on CRP acreage provided the environmental impacts have been considered according to subparagraph 367 F. For authority over 5 acres, COC shall submit a request in writing to CEPD through the State Office according to subparagraph 31 A. The 5.0-acre per contract threshold is a cumulative figure that is calculated by totaling the square footage of land area devoted to the footprint of the wind generating device and any firebreak installed around the footprint.
Access roads, transformers, and other ancillary equipment will not be considered in calculating the 5.0-acre per contract threshold. A refund shall apply for acreage terminated for access roads, transformers, and other ancillary equipment. See subparagraph 639 B.
Each request shall be documented in the COC minutes and for cases over 5.0 acres, forwarded to CEPD through the State Office. A copy of the completed FSA-850 signed by SEC shall be included with the request before final approval.
B Payment Reductions and Refunds
The payment reduction for installation of wind turbines, wind mills, wind-monitoring towers, or other wind-powered generation equipment is determined to be de minimus.
A refund applies to access roads, transformers, and other ancillary equipment terminated from CRP-1.

In order to comply with these provisions, the CRP Producer would have to make a request to the County Committee to install any equipment or towers on CRP, including a copy of the proposed area/footprint to be used and time frame.

Contact this office if you have any questions,

Rhonda A Deutsch
Roberts County FSA
2018 E HWY 10, Suite B
Sisseton, SD 57262
(605) 698-7639

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
200 Fourth Street SW
Huron, South Dakota 57350

Phone: (605) 352-1200
Fax: (605) 352-1270

October 28, 2011

Mr. Louis Hanebury,
Environmental Protection Specialist
Western Area Power Administration
PO Box 35800
Billings, Montana 59107-5800

RE: Northern Wind Project

Dear Mr. Hanebury:

Attached is the completed Form AD-1006 for the Northern Wind Project.

The project does impact prime and statewide important farmland. Enclosed is a Farmland Conversion Impact Rating Form (AD-1006) for this project. We have completed Parts II through V. Please complete Parts I, VI, and VII. If the Total Points in Part VII is less than 160 points, the proposed activity will have no significant impact on the prime and statewide important farmland in Roberts County, and no further alternatives need be considered.

Please return a copy of the form, upon completion, to this office. If you have any questions, please contact Rick Bednarek, Assistant State Soil Scientist, at (605) 352-1258.

Sincerely,

DEANNA M. PETERSON
State Soil Scientist

Attachment

cc: Kent Duerre, DC, NRCS, Sisseton FO

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 9/29/11
Name Of Project Northern Wind Project	Federal Agency Involved Department of Energy
Proposed Land Use Property Development	County And State Roberts County, South Dakota
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 9/29/11

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated	Average Farm Size 668 acres
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 575,587	% 81	Amount Of Farmland As Defined in FPPA Acres: 513,067	% 72
Name Of Land Evaluation System Used SD Crop Productivity Index	Name Of Local Site Assessment System None		Date Land Evaluation Returned By NRCS 10/25/11	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	2,480.0			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	2,480.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	166.3			
B. Total Acres Statewide And Local Important Farmland	1,048.8			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.2			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	105.0			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	32	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	32	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	32	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

This form was electronically produced by National Production Services Staff

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 – Federal agencies involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form.

Step 2 – Originator will send copies A, B and C together with maps indicating locations of site(s), to the Natural Resources Conservation Service (NRCS) local field office and retain copy D for their files. (Note: NRCS has a field office in most counties in the U.S. The field office is usually located in the county seat. A list of field office locations are available from the NRCS State Conservationist in each state).

Step 3 – NRCS will, within 45 calendar days after receipt of form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland.

Step 4 – In cases where farmland covered by the FPPA will be converted by the proposed project, NRCS field offices will complete Parts II, IV and V of the form.

Step 5 – NRCS will return copy A and B of the form to the Federal agency involved in the project. (Copy C will be retained for NRCS records).

Step 6 – The Federal agency involved in the proposed project will complete Parts VI and VII of the form.

Step 7 – The Federal agency involved in the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA and the agency's internal policies.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

Part I: In completing the "County And State" questions list all the local governments that are responsible for local land controls where site(s) are to be evaluated.

Part III: In completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them.

2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities) that will cause a direct conversion.

Part VI: Do not complete Part VI if a local site assessment is used.

Assign the maximum points for each site assessment criterion as shown in § 658.5 (b) of CFR. In cases of corridor-type projects such as transportation, powerline and flood control, criteria #5 and #6 will not apply and will, be weighed zero, however, criterion #8 will be weighed a maximum of 25 points, and criterion #11 a maximum of 25 points.

Individual Federal agencies at the national level, may assign relative weights among the 12 site assessment criteria other than those shown in the FPPA rule. In all cases where other weights are assigned relative adjustments must be made to maintain the maximum total weight points at 160.

In rating alternative sites, Federal agencies shall consider each of the criteria and assign points within the limits established in the FPPA rule. Sites most suitable for protection under these criteria will receive the highest total scores, and sites least suitable, the lowest scores.

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, adjust the site assessment points to a base of 160. Example: if the Site Assessment maximum is 200 points, and alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site "A."}$$

South Dakota
Wildlife Division
Department of Game, Fish and Parks

Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

November 10, 2011

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

RE: Scoping comments for Northern Wind Project Environmental Assessment

Dear Mr. Louis Hanebury,

This letter is in response to your request for scoping comments on the 2,480 acre Northern Wind Project (project) in Roberts County, South Dakota. Herein I will highlight the main wildlife and habitat concerns associated with project development in this area, provide information on South Dakota's wind turbine siting guidelines, and how to obtain more information on South Dakota's species at risk.

The proposed project is located in two unique physiographic regions: 1) Prairie Coteau, and 2) Prairie Coteau Escarpment (Bryce et al. 1998). These areas provide some of the few remaining tracks of native (untilled) tall-grass prairie in South Dakota. Native grasslands within the tall-grass prairie zone are decreasing at an alarming rate. Tall-grass prairie is considered one of the most endangered resources in North America. In South Dakota, less than one percent of native tall-grass prairie habitat remains (Samson et al. 1998). Tall-grass prairie remnants likely occur in the project area. These areas have high conservation value, especially those that contain a high diversity of both plant and animal species.

Lacking drainage and created by glaciers, the hilly landscape of the Prairie Coteau ecoregion has abundant semi-permanent and permanent wetlands. More specifically, this area is known to have some of the highest densities (>30 basins/10 miles^2) of natural semipermanent and permanent wetland basins in the state (Johnson and Higgins 1997). These permanent lakes serve as stronghold for wetland-dependant wildlife. For example, this ecoregion contains the highest densities of known colonial waterbird nesting colonies in the state (Drilling 2007).

The Prairie Coteau Escarpment ecoregion is unique in South Dakota due to its comparatively high elevation, undulating topography, and abundant precipitation (Bryce et al. 1998). High soaring birds, especially raptors, use thermal lift that is often associated with areas of elevation such as the Prairie Coteau Escarpment. Improperly sighted wind farms are known to cause significant mortality to raptors.

Phone: (605) 773-4193 · FAX: (605) 773-6245

Both bats and birds are known to be susceptible to direct strikes with wind turbines. Bat species that migrate long distances, such as migratory tree-roosting species, are commonly found killed by wind farms in the United States (Kunz et al. 2007). According to Risser et al. (2007) migratory tree-roosting bats account for 68% of bat mortalities recorded at North American facilities. There has been limited research conducted on bats in South Dakota. However, thirteen species of bats are currently known to be found in South Dakota (Table 1).

Table 1. South Dakota Bats

Common Name	Scientific Name	State Residency
Big Brown Bat	*Eptesicus fuscus*	Year-round resident
Fringed Myotis*	*Myotis thysanodes*	Year-round resident
Little Brown Myotis	*Myotis lucifugus*	Year-round resident
Long-eared Myotis*	*Myotis evotis*	Year-round resident
Long-legged Myotis	*Myotis volans*	Year-round resident
Northern Myotis*	*Myotis septentrionalis*	Year-round resident
Townsend's Big-eared Bat*	*Corynorhinus townsendii*	Year-round resident
Western Small-footed Myotis	*Myotis ciliolabrum*	Year-round resident
Hoary Bat	*Lasiurus cinereus*	Summer resident
Red Bat	*Lasiurus borealis*	Summer resident
Silver-haired Bat*	*Lasionycteris noctivagans*	Summer resident
Evening Bat*	*Nycticeius humeralis*	Migratory
Eastern pipistrell	*Pipistrellus subflavus*	unclassified

* = monitored by the Natural Heritage Program

During the construction and maintenance phase of a wind power project existing roads often experience increased traffic and new roads are constructed. This increases the amount of area disturbed and increases opportunity for the introduction and establishment of non-native plant species. Resulting control of those species through pesticides and herbicides may also impact habitats of rare wildlife species. Invasive, non-native plant species are one of the major threats to threatened and endangered wildlife species. Improved access can also increase human disturbance to wildlife in the area. Any disturbance to native vegetation should be kept to a minimum. Disturbed areas should be revegetated using native seed sources. The Natural Resource Conservation Service Plant Materials Center in Bismarck, ND may serve as a good source of information on native plantings (http://plant-materials.nrcs.usda.gov/ndpmc/).

The South Dakota Natural Heritage Program Database (NHPD) contains spatial information on species at risk and/or those that are rare and known to be within the project area. This information may be useful to you as you evaluate the project for potential impacts to wildlife species and habitat. Species at risk are those that are threatened or endangered (legally protected) or rare. Rare species are those that are declining and restricted to limited habitat, peripheral to a jurisdiction, isolated or disjunct

due to geographic or climatic factors or that are classified as such due to lack of survey data. If you would like to request a search of the NHPD, please contact Dave Ode (605) 773-4227 or Dave.Ode@state.sd.us. Please note that absence of a species from the NHPD does not preclude its presence in the project area. Many places in South Dakota have not been surveyed for rare or protected species.

In coordination with the SDBWG, the SDGFP has developed *Siting Guidelines for Wind Power Projects in South Dakota*. This document addresses many of the concerns involved with siting wind power projects in South Dakota and may be found on the web (http://www.sdgfp.info/Wildlife/Diversity/windpower.htm).

The SDGFP appreciates the opportunity to provide scoping comments. If you have any questions on the above comments, please feel free to contact me at 605-773-2742 or Silka.Kempema@state.sd.us.

Regards,

Silka Kempema

Silka L. F. Kempema
Terrestrial Wildlife Biologist

LITERATURE CITED

Bryce, S., J. M. Omernik, D. E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S. H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. [Two sided color poster with map, descriptive text, summary tables, and photographs.] Reston, Virginia: U.S. Geological Survey (scale 1:1,500,000).

Drilling, N. E. 2007. South Dakota statewide colonial and semi-colonial waterbird inventory with a plan for long-term monitoring: Final report. South Dakota Game, Fish and Parks Wildlife Division Report 2008-1. Technical Report M-ColonySD-04. Rocky Mountain Bird Observatory, Brighton, CO. 88 pages.

Johnson, R. R., and K. F. Higgins. 1997. Wetland resources of eastern South Dakota. South Dakota State University, Brookings, SD. 102 pages.

Kunz, T. H., E. B. Arnett, W. P. Erickson, A. R. Hoar, G. D. Johnson, R. P. Larkin, M. D. Strickland, R. W. Thresher, M. D. Tuttle. 2007. Ecological impacts of wind energy development on bats: questions, research needs, and hypotheses. Frontiers in Ecology and the Environment 5: 315-324.

Risser et al. 2007. Environmental Impacts of Wind-energy Projects. The National Academies Press. Washington D.C.

Samson, F. B., F. L. Knopf, and W. R. Ostlie. 1998. Grasslands. Pages 437-472 *in* M. J. Mac, P. A. Opler, C. E. Puckett Haecker, and P. D. Doran, eds. Status and Trends of the Nation's Biological Resources, Vol. 2. U.S. Department of the Interior, U.S. Geological Survey.

From: Lou Hanebury
To: Hilding, Nancy
CC: Bob Narem; Marsh, Matt; McFarlane, Joe; Rob Peterson - WCEC; Steve C...
Subject: Re: scoping letter for the Wind project near Summit SD
Attachments: NorthernWindScopingInvite_092811.pdf

Ms Hilding: I am sorry that you could not attend our scoping meeting. Attached is the scoping letter that you refer to that has the information you need. The project is in Roberts County. The USFWS is a cooperating agency and you can contact Brad Johnson at Waubay National Wildlife Refuge at 605-947-4521 or brad_johnson@fws.gov for the information on native prairie and easements. I will pass this email along to the project proponents. My contact information is below. Feel free to call me anytime. Thank your.

>>> Nancy Hilding <nhilshat@rapidnet.com> 10/19/2011 3:43 PM >>>
Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718
Oct 19th, 2011

Louis R Hanebury
Dept of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings MT 59107-5800

I have received a scoping letter for a wind project near Wilmot or Summit, SD from Western Area Power Administration, Dept of Energy.

The project is located 8 miles NW of Summit SD.
Proposes a 24,800 acre wind farm. to interconnect with a 115-k V transmission line.

Dept of Energy is preparing an EA to comply with NEPA. The land includes CRP contract lands as well as US FW Grassland and Wetland Easements. The map shows a "burial mound" on the site, thus there may be historic property concerns.

We are concerned about this project, but don't have enough information in the scoping letter to comment. As the property is under these easements/contracts, we wonder if the land is in virgin native prairie and if there are any rare plant community concerns.

Is the "burial mound" on the map for native american historic property and on any historical preservation lists? Due to potential impacts to the burial mound, this project may warrant an EIS.

Where are the CRP contract lands and the USFWS easement relative to the wind turbines. The map provided does not appear to show that.
What values do the USFWS easement seek to protect?
Who are the agency contacts for the CRP and the USFWS. Are these agencies cooperating on the NEPA document?

What part of the state is Summit SD in -- what County or larger city is nearby.

Please add us to the mailing list.

You provide your e-mail, but no telephone number in the letter. Can you send me a phone number so I can call?

Sincerely,

Nancy Hilding
--
Nancy Hilding
6300 West Elm
Black Hawk, SD 57718

605-787-6779 phone best to call me on
605-787-6466 phone and fax and voice mail and internet hook up
I have call waiting and "no answer" may mean both "land lines" in use (call before faxing)
cell phone 605-430-9230, I don't check cell messages regularly, thus do not rely on for ASAP calls

nhilshat@rapidnet.com
nhilding@rapidnet.com
phas.wsd@rapidnet.com

Western
AREA POWER
ADMINISTRATION

Northern Wind Open House
October 13, 2011, 5-8 PM Wilmot Community Center
Wilmot, South Dakota
Public Comment Meeting
Environmental Assessment (EA)

Thank you for your interest in the proposed Northern Wind EA. Please complete the appropriate sections of this form to be included on the EA mailing list and/or to provide comments. Written comments can be submitted at the Scoping Meeting, faxed to (406) 255-2900, mailed to Mr. Lou Hanebury, Western Area Power Administration, Upper Great Plains Customer Service Office, P.O. Box 35800, Billings, MT 59107-5800 or sent to **hanebury@wapa.gov.** To be included in our public comment process, please ensure your comments are postmarked or turned in by **November 10, 2011.**

- [x] I would like a paper copy of the Draft EA when it becomes available.
- [ ] I would like a Compact Disk (CD) of the EA when it becomes available.
- [ ] Just email me the web link to the EA when it becomes available. (Quickest and Preferred method)

Please Print Contact Info Below

Name:	Organization:
June + Donald Backman	Concerned Farmer
E-mail address:	Daytime Phone No. (*optional*):
	605-938-4170
Street Address:	City / State / Zip Code:
13379 Whipple Rd	Wilmot, SD 57279

Please indicate any questions, comments or concerns you have about the proposed project in the comment section below (continue on separate sheet if necessary).

Letter included

Thank you for your time and interest.

10-19-11

Dear Louis R Haneburg,

I have health concerned about the turbines I can't stand continuous noise, shadows + flashing lights, which causes pressure + bad head aches.

Some of our other concerns are:

A. under ground power leaks
B. Contaminated water, there are 3 dams on the land where 5 turbines west of our home feed our well (drinking) + creek.
C. Medical copter has route from Watertown to Sisseton
D. Vibration from under ground wire + turbines
E. lots of fog up here. Winds are mostly from west, ice road is only opened to one drive way.
F. Would totaly destroy hills, wild life, prairies + quietness
G How long are contracts, size of turbines, when contract runs out who takes over, what happens next?
H. Who is responable for human health + livestock if some thing goes wrong.

I have had people check on internet + talked to others about wind farms.

Our suggestion would be to put the 5 turbines from west of our place South and East of here That would help eliminate some noise, shadows + lights.

We are old fer people + have lived here 50 years + have enjoyed our life up here.

Sincerely
Donald Backman
June Backman
13379 Whipple Rd
Wilmot, SD 57279

From: RICHARD HENDRICKS <dixhen@wildblue.net>
To: <hanebury@wapa.gov>
Date: 10/12/2011 4:58 PM
Subject: Northern Wind Project

October 12, 2011

Gentlemen;

There are many concerns when bringing new industry into a community. In this case of Western Area Power Administration, some concerns include: native animal life, landscape, enviornmental issues, Native American burials grounds, and above all, the affects on peoples' health in the immediate area.

In a study group of the Mars Hill, Maine region, Dr. Michael Nissenbaum released a study in May, 2010 in regards to wind turbines and the affect of humans in that area. In reveals that 82% complained of new/worsened sleep deprivation, 41% reported new chronic headaches, and 59% claimed feeling stress. The individual's health is the most important issue. We have a duty to protect everyone while we find ways to use re-newable energy sources, says Danile Hedrich of Chilton, Wisconsin.

In this given project of Western Power, the 2,480 acre wind farm site in Spring Grove Township must be respective of the placement sites and give consideration to the residence who have farmsteads and homes in this township. The area is spacous enough to harbor a working relationship between industry and existing farmsteads.

Sincerely, Dixie Hendricks

Appendix C: Northern Wind Bird and Bat Conservation Strategy Letter to USFWS

Northern Wind, LLC
Attn: Robert Narem, President
14313 469th Ave
Twin Brooks, SD 57269-5314

January 2, 2014

U.S. Fish and Wildlife Service
South Dakota Field Office
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501-5408

Dear Mr. Scott Larson,

Northern Wind, LLC., is proposing to construct a 50–megawatt commercial, utility-scale wind energy generation facility in Roberts County, South Dakota. Northern Wind began development of the Project in 2010 and the Project will consist of up to 20 wind turbines, underground electrical collection system, access roads, meteorological monitoring station, and one substation. The attached map provides the Project's boundary and interconnection point.

As part of Northern Wind's commitment to responsible development, it will implement the U.S. Fish and Wildlife Services' (Service) March 23, 2012 Land-Based Wind Energy Guidelines (LBWEGs) in coordination with the Service South Dakota Ecological Services Office, the Services' Mountain-Prairie Regional Office and the South Dakota Game Fish and Parks (SDGFP). Northern Wind and its consultants have completed many Tier 2 and Tier 3 reviews and are currently in the process of contextualizing these assessments in the framework of a Biological Assessment (BA) under Section 7 of the Endangered Species Act and an Environmental Assessment (EA) under the National Environmental Policy Act. The BA was submitted to the Services' South Dakota Field Office on December 13, 2013 and the EA will be available for comment in January 2014.

As part of Northern Wind's implementation of the LBWEGs, it will work in coordination with both the Service and the SDGFP to develop a Bird and Bat Conservation Strategy (BBCS). In development of the BBCS, Northern Wind will consult with Service and SDGFP to ensure the Project will be constructed and operated in compliance, and to the best of Northern Wind's ability, with both the Endangered Species. Act of 1973, as amended, and South Dakota ESA Law. As identified in correspondence and verbal communications with the Service, species of concern are the bald eagle and northern long-eared bat. Northern Wind will ensure that a bald eagle and northern long-eared bat contingency plan that addresses both construction and operational risks the Project may pose to bald eagles and northern long-eared bats is included in the BBCS. The BBCS will not be confined to just birds and bats in the event that the Service and SDGFP identify non-bird or bat species of concern or their habitats that are not afforded legal protection.

Northern Wind has shown due diligence to avoid impacts to eagles and bats. Pre-disturbance eagle nest and bat use surveys have been completed per the Services Eagle Conservation Plan Guidance and LBWEGs. As a baseline for the BBCS document, Northern Wind will include the following commitments typical of wind energy facilities in South Dakota:

- The Project's electrical collection and transmission system will be designed, constructed, and operated pursuant to Avian Power Line Interaction Committee Guidelines.

Northern Wind, LLC
Attn: Robert Narem, President
14313 469th Ave
Twin Brooks, SD 57269-5314

- Temporary meteorological tower guy wires will be marked with marker balls to prevent avian strikes. If a permanent meteorological tower is required, construction will follow LBWEGS' guidelines.
- Disturbance areas, both temporary and permanent, will be minimized so as to disturb as little habitat as possible and minimize habitat fragmentation. Disturbed areas will be restored.
- Northern Wind is committed to avoiding all impacts to the western prairie fringed orchid should the species be detected during pre-construction surveys.
- An avian and bat post construction mortality study will be conducted for a minimum of one year following Project commissioning using protocol developed in coordination with Service and SDGFP as well as industry standard methods. Design of the protocol and evaluation of the need for subsequent surveys will be determined using the LBWEGS' guidance on Tier 4 surveys and in coordination with Service and the SDGFP.
- Northern Wind has developed a compensatory mitigation package for direct project impacts to Service grassland easements as well as high value and/or sensitive habitat as identified by Northern Wind in coordination with the Service and SDGFP.
- Project lighting will conform to the best management practices outlined in the LBWEGs. Plans for any temporary safety lighting associated with night-time construction or maintenance activities during spring and fall migration will be developed in consultation with the Service and SDGFP to ensure that the lighting will not disrupt bald eagle and northern long-eared bat migration. Lighting of turbines and other permanent infrastructure will be limited to the extent feasible in accordance with the Federal Aviation Administration to reduce the potential for attracting nocturnal migrants. External lighting at substations will utilize down shields and operation staff will be required to turn off internal turbine lights.
- Northern Wind will work with Service and SDGFP to identify minimization and mitigation actions for impacts to listed birds, bats, and other species of concern during construction and operation.
- Northern Wind will continue to coordinate with the Service and the SDGFP to avoid, minimize and mitigate impacts to species who's status changes to threatened or endangered during the development, construction, and operation of the project.

A more detailed discussion of avoidance, minimization and mitigation measures is included in the Project BA and EA. Northern Wind appreciates the opportunity to work collaboratively the Service and the SDGFP we look forward to developing the BBCS together.

Sincerely,

Robert Narem

Robert Narem, President
Northern Wind LLC

Appendix D: US Fish and Wildlife Service Biological Assessment Response Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

February 3, 2013

Nicholas J. Stas
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Re: Biological Assessment,
Northern Wind Project,
Roberts County, South Dakota

Dear Mr. Stas:

This letter is in response to your December 13, 2103, Biological Assessment for the above referenced 50 megawatt Northern Wind project as well as our January 13 and 31, 2014, conference calls with your agency and project proponents regarding compliance with section 7 of the Endangered Species Act (ESA). The Northern Wind Project is proposed on 2,480 acres of private land within portions of Section 9, 10, 15, 16, 21, 22, 27, and 28 in Township 123 North, Range 51 West, Roberts County, South Dakota.

In the Northern Wind BA you describe possible effects of the Northern Wind project on the federally threatened Western prairie fringed orchid (*Platanthera praeclara*) and the following species that are currently proposed for listing under the ESA: Dakota skipper (*Hesperia dacotae*), Poweshiek skipperling (*Oarisma Poweshiek*), Northern long-eared bat (*Myotis septentrionalis*), and Rufa red knot (*Calidris canutus rufa*). You have determined that the proposed project is not likely to adversely affect the Western prairie fringed orchid and not likely to jeopardize the continued existence of the proposed species. The Service concurs with your conclusions.

However, during our recent communications we learned that construction of the Northern Wind project is not likely to occur until after a listing decision (2014) on the proposed species. Of these species, the Dakota skipper appears vulnerable to adverse impacts from the project due to construction activities and possibly the long-term operations. If the Dakota skipper acquires full protection under the ESA, unauthorized take of the species will be prohibited by section 9 of the law. During our calls, your agency indicated an interest in initiating a formal conference to address adverse effects to the Dakota skipper if that species were to be listed. This process would involve our writing of a conference opinion that could then be adopted as a biological opinion if the species is listed, exempting take of the Dakota skipper.

To initiate a conference, we recommend sending us a letter to amend the existing Biological Assessment. The letter should make clear you are requesting a conference and describe the anticipated impacts to the species. Since direct impacts to such a small and cryptic species would be difficult to quantify, we recommend using habitat as a surrogate and identifying the amount of occupied and potentially occupied Dakota skipper habitat that will be temporarily and permanently impacted by the project. Additionally, the letter should detail all of the conservation measures proposed to minimize and offset impacts to the species discussed to date (e.g. moving turbines to avoid occupied skipper habitat, establishing easements on offsite properties, managing properties using our 2013 Dakota Skipper Conservation Guidelines, allowing post-construction access to the turbines to survey for Dakota skippers) and any others you may propose. While we have no established timeframes for formal conferencing, our policy is to complete conferences within the same timeframes established for formal section 7 consultation, thus we anticipate a complete conference opinion within 135 days from receipt of your complete BA amendment letter.

Regarding the Northern long-eared bat, we note that while preconstruction bat surveys did not specifically identify the species onsite, this bat was mentioned as a species that could potentially occur in the project area. While relatively little is known about the species' occurrence in South Dakota, the lack of preferred habitat (hibernacula or maternal roosting sites) within the project vicinity suggests its potential presence is low; thus, we do not currently recommend inclusion of the Northern long-eared bat in your request for a conference. You indicate in the BA that post-construction surveys for the Northern long-eared bat will be undertaken, and if fatality risk is revealed, increases in cut-in speed will be coordinated with our agency. Note that we are currently recommending blade feathering below a cut-in speed of 6.9 meters/second to reduce turbine collision risk to bats. As stated during our January 31, 2014, conference call, bat carcasses may be difficult to detect and can be quickly lost to scavenging. We recommend post-construction surveys be rigorous in design to maximize detection of bat carcasses. We request the opportunity to review and comment on such mortality monitoring protocol.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service must be informed so that the above determinations can be reconsidered.

We appreciate the opportunity to provide comments on this project. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Scott Larson

Scott Larson
Field Supervisor
South Dakota Field Office

Cc: USFWS; Waubay NWR, Waubay, SD
(Attn: Connie Mueller)
SDDGFP; Pierre, SD
(Attn: Silka Kempema)