

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE APPLICATION BY )  
BUFFALO RIDGE II LLC, A SUBSIDIARY OF )  
IBERDROLA RENEWABLES, INC. FOR AN )  
ENERGY CONVERSION FACILITY PERMIT )  
FOR THE CONSTRUCTION OF THE )  
BUFFALO RIDGE II WIND FARM AND )  
ASSOCIATED COLLECTION SUBSTATION )  
AND ELECTRIC INTERCONNECTION )  
SYSTEM )**

**FINAL DECISION AND  
ORDER; NOTICE OF ENTRY**

**EL08-031**

**Procedural History**

On October 31, 2008, Buffalo Ridge II LLC, a subsidiary of Iberdrola Renewables, Inc. (Applicant or Buffalo Ridge) filed an application with the Public Utilities Commission (Commission) for an Energy Conversion Facility Permit for the Construction of the Buffalo Ridge II Wind Farm and Associated Collection Substation and Electric Interconnection System (Project). The applicant proposes to construct and operate a wind farm on up to 77 acres dispersed throughout portions of up to 77 sections of land in Brookings and Deuel Counties as well as a 13-mile long 115 kilovolt overhead transmission line. The proposed wind farm could have a name plate capacity of up to 306 megawatts. On November 6, 2008, the Commission electronically transmitted notice of the filing and the intervention deadline of December 30, 2008, to interested individuals and entities.

The parties to this docket requested an extension of the notice and public hearing time frame pursuant to SDCL 49-41B-16 due to scheduling and notice complications and to set the hearing for January 5, 2009. Commission Staff requested waivers of SDCL 49-41B-15 and 49-41B-16 and also requested that the intervention deadline be extended to January 16, 2009, to give interested parties sufficient time to seek intervention. On November 25, 2008, at its regularly scheduled meeting, the Commission unanimously voted to grant the request for an extension of the notice and public hearing time frame and to set the hearing for January 5, 2009, granted waivers of SDCL 49-41B-15 and 49-41B-16 and extended the intervention deadline to January 16, 2009.

On December 3, 2008, the Commission received an Application for Party Status from the Deuel County Commission (Deuel). On December 24, 2008, the Commission received a Petition to Intervene from South Dakota Rural Electric Association (SDREA). On December 29, 2008, the Commission received Petitions to intervene from Sioux Valley Energy (Sioux Valley) and H-D Electric Cooperative, Inc. (H-D Electric). On January 13, 2009, the Commission received an Application for Party Status from the Brookings County Commission (Brookings). On January 15, 2009, the Commission received an Application for Party Status from Ralph Terrell Spence and Catherine D. Carter (Spence/Carter). On January 16, 2009, the Commission received a Motion for Entry of Protective Order from Buffalo Ridge. At its regularly scheduled meeting of January 27, 2009, the Commission granted intervention to Deuel, SDREA, Sioux Valley, H-D Electric, Brookings and Spence/Carter and granted the Motion for Entry of Protective Order.

On March 6, 2009, Spence/Carter filed a Memorandum to the Parties. On March 24, 2009, Brookings filed a letter from the County Commission in support of the Project. On April 3, 2009, the Commission issued and served its Order for and Notice of Hearing. On April 6, 2009, the Applicant, Staff and Brookings filed a Stipulation. At its regular meeting on April 7, 2009, the Commission considered the Stipulation. The Commission took no action on the Stipulation because of the pendency of the hearing scheduled for April 15, 2009. The Commission, however, directed that the parties having objections to the Stipulation file with the Commission by April 9, 2009 a statement of which of the proposed Findings of Fact and Conclusion of Law they consider in dispute and what additional issues not addressed in the proposed Findings of Fact and Conclusions of Law remain unresolved and at issue for the hearing in order to advise the other parties and the Commission of what issues remain to be addressed at the hearing. On April 8, 2009, Deuel filed a statement stating that it had no formal comment on the Stipulation. On April 9, 2009, Spence/Carter filed their statement of issues for hearing, and on April 9, 2009, Sioux Valley, H-D Electric and SDREA (REA Parties) filed their Statement of Issues and Objections to Proposed Findings of Fact and Conclusions of Law. On April 14, 2009, Staff filed a Staff Motion and Undisputed Fact, Law and Proposed Conditions. On April 15, 2009, Applicant filed a revised exhibit to the Application entitled "Exhibit H: Revised 115 kV Route" and a revised description for the Application of the exhibit's contents.

The hearing was held as scheduled on April 15, 2009, in Brookings. Applicant, Spence/Carter, the REA Parties and Staff appeared and participated in the hearing. At the outset of the hearing, Applicant and the REA Parties offered into evidence as Exhibits IC and ID two Stipulations, one between Applicant, Sioux Valley and SDREA and the other between Applicant, H-D Electric and SDREA. The Stipulations were received into evidence without objection. The Commission voted unanimously to approve the Stipulations. The Stipulations resolved the REA Parties issues with the Application, and the REA Parties were excused from the hearing.

The matter was placed on the agenda for decision at the Commission's regular meeting on April 21, 2009. On April 20, 2009, the REA Parties filed Proposed Findings of Fact and Conclusions of Law requesting that the Commission's decision reflect the terms of the Stipulation previously approved by the Commission at the hearing. On April 21, 2009, at its regular meeting, the Commission voted unanimously to:

- (i) approve the Stipulation among Applicant, Staff and Brookings and adopt the Stipulation's proposed Findings of Fact, Conclusions of Law and Terms and Conditions, subject to any subsequent action of the Commission on pending motions of the parties or motions of the Commission to modify such proposed Findings of Fact, Conclusions of Law and Terms and Conditions;
- (ii) adopt the REA Parties' Proposed Findings of Fact and Conclusions of Law and modify the Stipulation's Findings and Conclusions accordingly;
- (iii) adopt additional findings of fact, conclusions of law and terms and conditions as necessary to put in place the process for a ten year decommissioning review, as suggested by Applicant at the hearing, under which Applicant would be required to submit an updated decommissioning plan, together with supporting Project status and Applicant financial information, within 90 days following the date ten years after the commencement date of Project operations, following which the Commission would take such action as the Commission deemed necessary regarding any requirement for Applicant to provide financial assurance of adequate funding for decommissioning as provided in ARSD 20:10:22:33.01;

(iv) with respect to the Spence/Carter set back issues, adopt findings (a) that the 1355 foot distance of turbine 91 from the Spence/Carter residence exceeds the 1000 feet Brookings County residential set back standard by over 35 percent, (b) that the sound level at the Spence/Carter residence at such distance predicted by Applicant's model employing the noisiest turbine would be 42 dBA - 43 dBA or significantly below the 50 dBA standard adopted by the Commission in previous generation facility decisions and by Brookings County in its ordinance, (c) that the 1000 foot set back requirement has proven to be a reasonable standard as demonstrated by the evidence of the diligent research Brookings County undertook in adopting this standard and due to the lack of evidence of problems or complaints at this sound level from existing wind or other generation facilities, and that Spence/Carter had presented no evidence of special circumstances upon which the Commission could base either an exception to the set back standard limited to just Spence/Carter or a general set back standard exceeding the 1000 foot standard;

(v) instruct Commission Counsel to make such edits and adjustments to the findings of fact, conclusions of law and terms and conditions adopted by the Commission as necessary to integrate them into a coherent decision for issuance by the Commission; and

(vi) approve the permit to construct the Project subject to the Findings of Fact, Conclusions of Law and Terms and Conditions of the decision approved today and contained in the final decision issued by the Commission.

Having considered the evidence of record, applicable law and the Stipulations and arguments of the parties, the Commission makes the following Findings of Fact, Conclusions of Law and Decision:

## **FINDINGS OF FACT**

### **I. Purpose**

The purpose of the Project is to develop the identified wind resource in the Brookings and Deuel counties area to meet a portion of the regional demand for renewable power.

The effect of delay or termination of the construction of the proposed wind farm facility would be detrimental to the Applicant. Delay would result in losing the current positive opportunities for the Project, including its "interconnect-ready" status and favorable position for turbine allocation. Significant delay in receiving the permits necessary to start construction could result in termination of the Project.

### **II. Project and Site Description**

The Project will be located on approximately 77 acres dispersed throughout portions of up to 77 sections of land in northeastern Brookings County and southeastern Deuel County, South Dakota near the city of White and containing portions of the towns of Astoria and Toronto. Portions of the Project are located within the assigned service area of Sioux Valley, and portions of the Project are located within the assigned service area of H-D Electric. Sioux Valley and H-D Electric are rural electric cooperatives that provide electric service to customers within their respective assigned service territories.

The Application is submitted based on a preliminary layout presented in attached EXHIBIT A, with an understanding the final project layout may change. Specifically, the final layout may have fewer or more turbines than what is shown. The final design will adhere to conditions set forth in the permit along with all other legal and local requirements including but not limited to setbacks from roads and houses and noise restrictions. The Project layout may change based on turbine type, engineering issues and landowner preference.

The Project will be comprised of the following components:

- Up to 204 1.5 MW, 153 2.0 MW, 145 2.1 MW, or 127 2.4 MW wind turbine generators (“WTGs”)
- Access roads to each WTG
- Underground and overhead 34.5 kilovolt (kv) electric collector lines connecting the WTGs
- A 210 MW and 96 MW Project collection substation, identified as BR II – North and BR II – South, respectively.
- A Project Operations and Maintenance (O&M) facility
- An approximately 13-mile long 115 kilovolt (kV) overhead transmission line connecting the BR II – North substation to Xcel Energy’s Brookings County substation.
- Upgrades to the Brookings County substation
- One to two permanent meteorological towers
- One SODAR unit

#### **A. Wind Tower Generators**

The final turbine selection will dictate the final layout to meet all setback and other safety requirements. Aside from turbine type and size, ongoing discussion with Brookings and Deuel County Zoning and highway departments, other factors that could affect ultimate turbine and road locations include unstable soil conditions and impacts to cultural or biological resources. The Applicant submitted examples of turbine types that will range from 1.5 to 2.4 MW as part of the application but will not be limited to specific turbine types within that range for the Project.

- If 1.5 MW turbines are used, then up to 204 turbines will be constructed.
- If 2.0 MW turbines are used, then up to 153 turbines will be constructed.
- If 2.1 MW turbines are used, then up to 145 turbines will be constructed.
- If 2.4 MW turbines are used, then up to 127 turbines will be constructed.

The Applicant will submit a final preconstruction layout to the Commission when it is completely developed. Any new facility locations not surveyed as part of the final preconstruction layout will be surveyed for biological and cultural resources. The result of said surveys shall also be filed with the Commission.

#### **B. General Wind Turbine Specifications**

Although the exact Wind Turbine Generator (“WTG”) models are not yet known and subject to change, a WTG model will be selected to optimize land and wind resources in the most cost-effective manner. Each WTG is mounted on a single steel tower, approximately 80 to 100 m high and approximately 5 m in diameter at the base and secured by a concrete foundation. The four WTG types being considered are all active yaw- and pitch-regulated machines with power and torque control capabilities. Each WTG has three blades. The length of the blades is dependent upon the model chosen; the Applicant anticipates rotor diameter of 78 m to 95 m.

The support tower is expected to be a tapered monopole. Welds are made in automatically controlled power welding machines and ultrasonically inspected during manufacturing per American National Standards Institute specifications. All surfaces are sandblasted and multi-layer coated for protection against corrosion. The WTGs are uniformly painted a neutral color and are typically fabricated in three or four sections and assembled on-site.

### **C. Wind Turbine Foundations**

The WTGs shall be supported by a reinforced concrete foundation, ranging from 15 to 24 m in diameter. The foundation design for each turbine will be specifically determined based on site-specific geotechnical information and structural loading requirements of the selected turbine model. The majority of the turbine foundation will be underground. The area permanently disturbed during operations will be a circular area with a radius of approximately 7 m. These dimensions include a turbine tower with a radius of up to 2.4 m and surrounding gravel area with a radius of up to 4.6 m which represent the largest tower diameter and maximum graveled area.

### **D. Wind Turbine Construction**

During construction it is likely that a temporary stockpile or lay down area will be selected within the Project boundary. WTG components may be temporarily stored in this 15 – 20 acre site before being moved to the final location. Also, one or more concrete batch plants may be necessary during construction in order to prepare concrete for foundations on site. If utilized, they will impact approximately 3 acres of land and it is anticipated they will be located within the temporary lay down areas.

During construction a larger area will be used to lay down the rotors and maneuver cranes during turbine assembly. Assembly will require a 15 m by 152 m compacted earth or gravel crane pad extending from the end of the access road to the turbine foundation. Also required will be an approximately 79 m by 79m to 102 by 102m area for component laydown and rotor assembly centered close to the WTG foundation. For purposes of impact studies the applicant used figures assuming the most possible land affected.

### **E. Access Roads**

Each WTG will be accessible via all-weather gravel roads. Approximately 34 miles of access roads will be built. The final road layout is dependent on final tower site selection. Access roads will follow fence lines, field lines, and existing field access roads to the extent possible. All roads will include appropriate drainage and culverts while still allow for the crossing of farm equipment. Access roads will be approximately 4.9 m wide and will be covered with road base design to allow passage under inclement weather conditions.

The access roads will consist of graded dirt, overlaid with geotechnical fabric if needed and will be covered with compacted earth or gravel. To facilitate crane movement and equipment delivery during construction of the Project, an additional 2.5 m of compacted earth or gravel roadway will be temporary installed on either side of the permanent roadway for a total width of 9.9 m.

#### **F. O & M Facility**

The proposed operations and maintenance facility will be within the project boundaries and located on approximately 3 to 5 acres within private land leased by the Applicant. The building used for this purpose houses the equipment to operate and maintain the wind farm.

#### **G. Meteorological Towers and SODAR Units**

The Applicant constructed three temporary meteorological towers within the Project boundary and three more within one mile of the Project boundary. The temporary towers will be removed at the Applicant's discretion and most likely within eighteen months of Project construction. The Project will most likely include one or two permanent meteorological towers to house anemometers to measure the wind. The permanent towers will be un-guyed and lit according to the Federal Aviation Administration guidelines. The permanent impact of the towers will be approximately 6.2 m by 6.2 m. Final site selection for the towers will depend on the final turbine type selection which will dictate how many towers are ultimately built.

#### **H. 34.5 kV Underground Collection System**

Approximately 51 miles of underground 34.5 kV collection lines will be constructed. The underground facilities will not interfere with farming operations and the Applicant will join the South Dakota One Call System and comply with all its mapping requirements.

The underground electrical collection and communication systems generally will be installed by plowing or trenching the cable, resulting in an 8 ft wide corridor of temporary impacts to soils and vegetation per single circuit. Each additional circuit along the same corridor will result in an additional 8 ft width of temporary impacts.

In cropped areas, segregated topsoil will be temporarily stockpiled prior to trenching. The Applicant shall make all reasonable efforts to replace the disturbed soils and topsoils over the buried cable within one day, thus restoring the drainage patterns and surface topography to pre-existing conditions. In rangeland and prairie an alternative trenching method to minimize effects shall be used. In an attempt to minimize disturbance to the native seedbank, topsoil will not be stockpiled. Rather, the Applicant shall re-vegetate the disturbed soils with weed free native plant seed mix. Finally, to completely eliminate impacts to Topeka shiner habitat, waterways or adjacent wetlands the Applicant shall use directional boring in those identified locations to install the underground collector system.

#### **I. 115 kV/34.5 kV Overhead System**

The Project will utilize both an approximate 13 mile 115 kV Transmission Line (115 kV Line) and an approximate 4 mile 34.5 kV overhead collector system (34.5 kV Overhead). Where practicable, these two systems will share support structures (poles) and right-of-way. Final preconstruction design plans shall be submitted to the Commission. Buffalo Ridge II will purchase all of its electric energy and power needs for station power from Sioux Valley and H-D Electric, at prevailing and applicable commercial/industrial rates, for the portions of the wind farm located within the assigned service territories of Sioux Valley and H-D Electric, respectively, except when generating power from the wind farm for the provision of authorized self supply of station power. Buffalo Ridge II will interconnect to Sioux Valley and H-D Electric at "Points of Delivery" to be determined from time to time by the parties.

## **J. Buffalo Ridge II North Substation Collection and Delivery System**

The Buffalo Ridge II North Substation (Section 19 of Oak Lake Township) will collect, via a 34.5 kV underground and overhead collector system, a total of 210 MW of generation. This power will then be transformed to 115 kV at the Buffalo Ridge II North Substation then delivered via the 115 kV Line to the Xcel Energy's Brookings County substation (Brookings Substation) which is adjacent to the Buffalo Ridge II South Substation (Section 25 of Sherman Township). Buffalo Ridge II will not use its collector circuits or lines to supply or distribute power to existing or new end-user customers within Sioux Valley's or H-D Electric's service territories.

**34.5 kV Overhead.** A portion of the Project will be delivered to the Buffalo Ridge II North Substation via the 34.5 kV overhead. The 34.5 kV overhead will start at the northern portion of the Project, just south of the Deuel County border and remain in road or private rights-of-way until it reaches the Buffalo Ridge II North Substation. The structures will include standard overhead distribution lines consisting of wooden or steel poles approximately 65 ft tall, with an average span length of approximately 150 to 200 ft. Temporary impacts will occur within the width of the right-of-way as well as approximately 1,000 square ft per pole for temporary laydown impacts. For purposes of calculating permanent impacts calculations in the application a worst case assumption was made of 50 square feet per pole. The final preconstruction design of the 34.5 kV Overhead structures will be finalized prior to the start of construction, and will be filed with the Commission.

**115 kV Line.** Approximately 13 miles of 115 kV transmission line will be built to connect the Buffalo Ridge II North Substation to Xcel Energy's Brookings County substation which is adjacent to the Buffalo Ridge II South Substation. Less than one mile of this line will be built outside parcel lines and public rights-of-way. The line will be constructed using single-pole wood or steel structures with a height of up to 75 feet, with an average span length of approximately 250 ft. Temporary impacts will occur within the width of the right-of-way as well as approximately 1,000 square ft per pole for temporary laydown impacts. For purposes of calculating permanent impacts calculations in the application a worst case assumption was made of 50 square feet per pole. The final preconstruction design of the support structures will be finalized prior to the start of construction, and will be filed with the Commission.

## **K. Buffalo Ridge II South Substation Collection and Delivery System**

The Buffalo Ridge II South Substation will collect a total of 96 MW of generation via the approximate 3.5 mile 34.5 kV overhead collector system. This power will then be transformed to 115 kV at the Buffalo Ridge II South Substation then delivered to the adjacent Brookings Substation. The 34.5 kV Overhead will share structures and rights-of-way with the 115 kV Line running from the Buffalo Ridge II North Substation (see 115 kV Line, above). Buffalo Ridge II will not use its collector circuits or lines to supply or distribute power to existing or new end-user customers within Sioux Valley's or H-D Electric's service territories.

Both new facilities will have a gravel surface within surrounding chain-link security fences and the substation components will be placed on concrete and steel foundations.

#### **L. Future Wind Project - Deuel County**

IBR is currently working on an early stage development project, north of the Project boundary in Deuel County. In the event that the Applicant permits and builds this wind project (the Development Project), the northern portion of the 34.5 kV Overhead route (from just south of the Deuel County border until it reaches the Buffalo Ridge II North Substation) will share structures and rights-of-way with a new to be permitted 115 kV transmission line, similar to the 115 kV Line described above. From the Buffalo Ridge II North Substation to the Brookings Substation, the existing 115 kV Line right of way and structures will be modified to carry an additional 115 kV circuit for the Development Project.

#### **M. Improvements to Brookings County Substation**

BR11-North will interconnect to Xcel Energy's Brookings County substation and BR11-South will interconnect to the Brookings County substation. All improvements are anticipated to occur within the existing footprint of the Brookings County substation and no increases in impervious surfaces would occur.

### **III. Right-of-Way Restoration and Maintenance**

During construction, crews will limit ground disturbance wherever possible. Temporary disturbance areas will be restored to their original condition to the extent practical, and as negotiated with each landowner. Reclamation activities will include removing and disposing of debris, dismantling all temporary facilities, leveling or filling tire ruts, and controlling erosion. Reseeding areas disturbed by construction activities will be done with a seed mix free of noxious weeds, similar to that which was removed.

Maintenance crews will perform inspections, maintain equipment, and make repairs over the life of the transmission line. Inspection will occur by aerial or ground patrol. Routine maintenance will be performed approximately every five years, or more frequently if necessary, to remove vegetation that may interfere with the safe and reliable operation of the proposed transmission line.

### **IV. Estimated Cost of the Project**

The estimated total cost of the Project is expected to be over \$620 million, based on 2010 price estimates. This cost includes planning, easement acquisition, permitting, and construction. Of the total cost, the 115 kV transmission line would account for approximately \$9 million, and the other Project facilities (WTGs, access roads, electrical collection system, meteorological towers and SODAR unit) would account for the remainder, approximately \$611 million.

### **V. Site Selection**

The Applicant was prudent in its site selection and examination of the necessary site criteria. To ensure an economically viable product it must be located near a utility service area that desires to enter into a Power Purchase Agreement with a renewable energy-producing facility or be located in a liquid market like MISO that allows project owners to sell into the market and receive a nodal price. Furthermore, the wind energy potential must provide a sufficient amount of energy in an area where landowners are amenable to entering into lease agreements, and where land use provides sufficient space for optimum turbine spacing. Finally, the transmission

capacity must be such that the power generated by the project can be relatively easily interconnected into the utility grid.

## **VI. Environmental Factors and Physical Environment**

Applicant has provided environmental information regarding the Project Area as part of its Application. The existing environment and estimates of changes and impacts to the existing environment are found in Sections 8-11, 14, 15, and 17 of the Application.

### **A. Geological Features**

The Project is located on a landform known as Buffalo Ridge. The South Dakota Geological Survey (SDGS) describes the Project area (for both the wind farm facility and the 115 kV transmission line) as being covered by glacial sediment deposits (glacial till) of early Wisconsin age. The thickness of glacial deposits throughout the Project area ranges from 500 to 700 feet.

The SDGS bedrock map indicates that the uppermost bedrock unit underlying the Project area (both the wind farm facility and the 115 kV transmission line) consists of Upper Cretaceous age shales of the Pierre Shale and Niobrara Formation. The younger Pierre Shale is described as blue-gray to dark-gray, fissile to blocky shale, with persistent beds of bentonite, black organic shale, and light-brown chalky shale. The unit contains minor sandstone, conglomerate, and abundant carbonate and ferruginous concretions. Thicknesses in this unit are up to 1,000 ft in the area, but the unit is absent in the eastern portion of the Project boundary.

The Niobrara Formation, which directly underlies the glacial drift throughout most of the site, is described as a white to dark-gray argillaceous chalk, marl, and shale. It weathers yellow to orange and contains thin, laterally continuous bentonite beds, chalky carbonaceous shale, minor sand, and small concretions. Unit thickness for this formation is up to 150 ft.

### **B. Economic Deposits**

The primary economic geologic deposits in the Project area consist of sand and gravel. The main economic uses for sand and gravel resources are in construction, primarily road base and concrete aggregates. Review of United States Geological Survey mapping, aerial photography and a field review of the Project area revealed gravel pits in or near the Project boundary.

### **C. Soil Types**

Soils in the Project area primarily consist of a variety of loams, silt loams, silty clay loams and sandy loams derived from underlying glacial tills (USDA, 1959). The loamy soils in the Project area are not highly susceptible to erosion. Most of these soils are conducive to agricultural activities including crop production and livestock grazing. Some of the soils in the Project area exhibit hydric characteristics; these hydric soils are isolated and generally associated with small prairie pothole-type wetlands or drainage ways.

### **D. Potential for Erosion and Sedimentation**

In general, surficial soils on flat areas are less prone to erosion than soils in sloped areas. Construction on or adjacent to steep slope areas can render soils unstable, accelerate natural erosion processes, and/or cause slope failure. The Applicant designed the Project to minimize construction cut and fill work and minimize construction in steep slope areas. The WTGs are

generally located at higher elevations to maximize exposure to wind and avoid steep slope areas for foundation installation. The current layout has sited access roads to avoid steep slopes as much as possible, and the underground collector lines similarly avoid crossing steep ravines whenever feasible. In general, the overhead lines (both 34.5 kV collection line and 115 kV transmission line) are routed parallel to roadways in areas that have gently rolling to flat topography.

An exception, however, is the cross-country area of the 115 kV transmission line (along the section line between Section 12 of Sherman Township and Section 7 of Richland Township) where there are relatively steep slopes and rolling hills. The Applicant will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will be developed once more detailed engineering information on grading and final preconstruction design is determined for the Project, and will mandate Best Management Practices (BMPs) to control erosion and sedimentation. BMPs may include silt fencing, erosion control blankets, re-vegetating side slopes, temporary storm water sedimentation ponds, or other methods of controlling storm water runoff and minimizing erosion and sedimentation. The SWPPP and National Pollution Discharge Elimination System (NPDES) Notice of Intent (NOI) will be developed after final civil design is completed. The NOI will be submitted to the South Dakota DENR and the SWPPP will be submitted to Brookings and Deuel Counties for review and approval prior to construction.

During construction, BMPs shall be implemented to control erosion and ensure that drainage ways and streams are not impacted by sediment runoff from exposed soils during precipitation events. In steeper areas, such as along the cross-country segment of the 115 kV transmission line, particular care will be taken to minimize cuts and/or fills, and to employ appropriate erosion prevention measures. During operation, the wind farm facilities and 115 kV transmission line are not expected to increase soil erosion rates, and the relatively small amount of additional impermeable surfaces (77 acres over the 49,482-acre Project boundary) are not expected to impact the soil resources of the area.

#### **E. Seismic Risks and Subsidence Potential**

Seismic activity in South Dakota is low, especially in the eastern portions of the state. No earthquakes have been reported in Brookings or Deuel Counties. As a result of several hundred feet of glacial till covering the underlying bedrock, it is unlikely subsidence will pose a significant hazard

#### **F. Geological Constraints**

There are no geological constraints to construction of the Project. Soil characteristics may change the design requirements of individual wind turbine tower foundations. Prior to construction, soil borings will be performed at all turbine locations to ensure the foundation design is suitable for the physical conditions. If unsuitable soils are found, the center point of the foundation shall be shifted or the turbine may be dropped from construction.

#### **G. Hydrology**

Groundwater is present at varying depths across the Project area. Buried quaternary sand and gravel outwash deposits (referred to as the Big Sioux Aquifer) comprise the primary aquifer within the Project boundary (both for the wind farm facility and in the vicinity of the 115 kV transmission line); bedrock formations generally are not a major source of groundwater

(Schultz, 2004). Regional groundwater flow is generally to the south and west; local groundwater flow is variable and often driven by topography.

### **1. Effect on Current Planned Water Uses**

The facility will have no impact on either municipal or private water uses in the Project area. It is likely that rural water supply will be necessary for the O&M facility. Water usage at the O&M facility will be similar to household volume. The Applicant will coordinate with Brookings-Deuel Rural Water to avoid impacts to their water lines in the Project area during construction. The O&M facility requires a septic system be installed. The septic system will be engineered to comply with all state and local requirements, and all necessary permits will be obtained from the appropriate agencies prior to construction. Installation of the septic system will not affect groundwater quality.

No installation or abandonment of any wells is anticipated for the Project. In the event wells are abandoned, they will be capped as required by South Dakota law. No residential wells will be permanently impacted by turbine placement. In the unlikely event that construction dewatering impacts a water supply well not located at or near a residence (e.g., a livestock water supply well), provisions will be made to ensure that an adequate supply of water is provided until dewatering activities have been completed. The Project will have no impact on surface water availability or use for communities, schools, agriculture, recreation, fish, or wildlife.

### **2. Surface and Groundwater Use and Affects**

Potential impacts to water resources from the construction and operation of the Project include: (i) deterioration of surface water quality through sedimentation, (ii) impacts to drainage patterns, (iii) impacts to flood storage areas; and, (iv) increased runoff due to the creation of impervious surfaces. No impacts to groundwater quality are expected from the Project.

The construction of wind farm and transmission line facilities can require dewatering of shallow groundwater, especially during excavation for WTG foundations or transmission line poles. Construction dewatering temporarily lowers the water table in the immediate area and may temporarily lower nearby surface water elevations depending on the proximity and connectivity of the groundwater and surface water. Groundwater dewatering is not anticipated to be a major concern with the Project since WTGs are most likely to be placed at higher elevation where the water table tends to be deeper. Similarly, it is anticipated that the 115 kV transmission line structures will be placed to span all wetlands and water features, thereby generally avoiding low areas where the water table may be closer to the surface.

Should groundwater be encountered that must be dewatered, all necessary permits will be obtained, and the duration of dewatering will be minimized to the extent possible. Dewatered groundwater will be properly handled to allow sediments to settle out and be removed before the water is discharged to minimize soil erosion and sedimentation of surface waters.

In general, because WTGs will be located at higher elevations within the Project area to maximize wind exposure, impacts to ephemeral streams and drainage ways are not anticipated from the turbine sites. There is the potential for access roads to permanently impact ephemeral streams and drainage ways; however, roads have been sited to avoid crossing or paralleling streams wherever feasible. Where stream/drainage way crossings cannot be avoided, appropriately designed culverts will be placed to maintain the free flow of water. The additional

impermeable surfaces introduced by the wind farm facilities (77 acres) will be spread throughout the 49,482-acre Project boundary, and is not expected to change existing drainage patterns.

The 115 kV transmission line will be designed to span surface water stream features, and the small area of impermeable surfaces resulting from the transmission structures (0.30 acres) is not expected to change existing drainage patterns.

WTGs will be located at higher elevations, and the current layout avoids placing turbines in FEMA-mapped floodplains. To the extent possible, access roads have been placed to avoid FEMA mapped floodplains, and additional surveys are underway to confirm that access roads are out of the 100-year floodplain elevation.

One crossing of a FEMA-mapped floodplain is proposed between two turbines in Section 22 of Oak Lake Township. Because the permanent access road between these turbines will be built at grade, and will be designed to allow for adequate surface flow and drainage during precipitation events, it will not result in any loss of flood storage volume. If a situation arises where additional floodplain impacts cannot be avoided, a floodplain analysis will be conducted to quantify impacts and determine appropriate mitigation requirements. It is anticipated that the 115 kV transmission line structures will be placed to span the FEMA 100-year floodplains crossed by the proposed route. Therefore, no impacts will result from the 115 kV transmission facilities.

The creation of impervious surfaces reduces the capacity of an area to absorb precipitation into the soil and tends to increase the volume and rate of storm water runoff. The Project will create up to 77 acres of impermeable surface through the construction of turbine pads, access roads, meteorological towers, overhead collection and transmission line structures, SODAR unit, O&M facility, and the Project substation. Although the turbine pads, access roads, and yards of the O&M facility and Project substation will be constructed of compacted gravel and will not be paved, this level of compaction generally inhibits infiltration and could increase runoff. However, the 77 acres of new impervious surface (of which 0.3 acres will occur from construction of the 115 kV transmission line) represents less than 0.5 percent of the total acreage in the Project area; therefore, the Project is not expected to cause significant changes in runoff patterns or volume. However, as noted in Section VI (D), appropriate storm water management BMPs will be implemented during the construction and operation of the wind farm and transmission line facilities. These BMPs are anticipated to adequately mitigate the effects of any increases in runoff volume due to the increase in impervious surface.

## **H. Effect on Wildlife**

In general, species present within the Project area are those typically found in agricultural landscapes, pasture grasslands and wetland habitats. There are approximately 540 acres of USFWS grassland easements within the Project site, and 611 acres of South Dakota Game Fish and Parks (GFP) walk-in areas. There are also two USFWS Waterfowl Production Areas (WPA) located within the Project boundary, totaling approximately 97 acres. Both the USFWS easement and WPA lands and the GFP walk-in areas can provide grassland and/or wetland habitat for wildlife.

The Project area contains both wetland and upland bird habitat. A field review concluded that birds migrate through the Project boundary, including passerines, raptors, and waterfowl. Woodlots, wetlands, and riparian areas scattered throughout the Project may provide stopover habitat for migrants or individuals during post-breeding dispersal. Harvested grain crops could

serve as a feeding area that could attract migrating and wintering waterfowl. However, these types of habitats are found throughout the region and therefore their presence in the Project should not concentrate bird use as compared to adjacent areas.

Although no cliff or rock outcrops were identified, potential raptor nesting sites in the form of trees (scattered and in planted shelterbelts and woodlots) occur throughout the Project area. The topography of the site, which consists of flat to rolling areas, is not expected to support dense raptor populations, due to a lack of steep ridges and rims. No raptor nests were observed during the site visits but potential nest structures for above ground nesting species were present in the form of living and dead trees. Farmsteads observed during the site visit usually had tree rows or woodlots associated with them. Grassland areas could provide nesting habitats for ground-nesting raptors.

Bats are a concern in proposed wind farm projects due to the potential for increased bat mortality associated with wind turbines. The site visit did find potential roosting habitat (trees and buildings) within the Project site. No caves were noted on the site visit, and neither the GFP nor USFWS has informed the Applicant of bat caves within the site boundary. No bats were directly observed during the site visit, but the site visit report concluded that bats are likely to be found within the Project area.

Species of concern could potentially be found within the proposed Project site. As a result, necessary studies were conducted and mitigating action will be implemented to avoid sensitive areas. Overall, direct and indirect impacts to wildlife could occur through loss of or change to habitat due to construction and operation of the proposed Project. For example, direct impacts to wildlife populations could occur due to mortality resulting from bird and bat collisions with wind turbines. The Applicant will, therefore, complete one year of pre- and one year of post-construction monitoring to determine avian and bat use of the Project area before and after Project implementation, and also to determine mortality rates associated with Project operation. The methodology of the preconstruction studies has been reviewed and approved by USFWS and GFP.

#### **I. Effect on Aquatic Ecosystems**

The primary potential for impact to aquatic ecosystems will be from increased sedimentation or increased total suspended solids due to soil erosion from the Project construction sites. Construction on or adjacent to steep slope areas can render soils unstable, accelerate natural erosion processes, and cause slope failure. During construction, BMPs as described in Section VI (D), will be implemented to ensure that drainage ways and streams are not impacted by sediment runoff from exposed soils during precipitation events. No overhead transmission poles will be placed in streambeds.

Impacts to wetlands will be minimal, Project facilities will be constructed in the upland hill areas and wetlands will be avoided to the extent possible when positioning access roads collection feeder lines, and the overhead 115 kV transmission lines.

#### **J. Water Quality**

In addition to the previously mentioned BMPs, Brookings and Deuel counties will require a soil erosion and sediment control plan. Since erosion and sediment control will be in place for construction and operation of the Project, no impacts to water quality are expected as a result of the Project.

## **K. Air Quality**

During construction of the Project, fugitive dust emissions will increase due to truck and equipment travels in the area. Additionally, there will be short term emissions from diesel trucks, construction equipment, and the batch plant, if used. The additional particulate matter emissions are not expected to exceed the National Ambient Air Quality Standards (NAAQS). The operation of the wind farm facility will produce no air emissions. There will be no significant emissions from the operation of the transmission facilities.

The circuit breakers of the proposed Project substations and the addition to the Brookings County substation likely will contain small amounts of SF6. Release of SF6 from a breaker or other electrical device can occur during the initial filling process or due to leaks after filling. Leakage is monitored closely and repaired promptly if detected. It is not anticipated that the very small amounts of SF6 used in the proposed substation components will cause an air quality impact.

## **L. Health and Welfare**

The Project components will be located to minimize changes and impacts to the existing environment thus having minimal overall effects. It is not anticipated this Project will create any significant direct, cumulative, or synergistic hazards to the health and welfare of human, plant or animal communities.

## **VII. Land Use**

### **A. Existing Land Use**

Within the Project boundary, the majority of the land is in cultivated cropland (60.3 percent). In addition to cultivated cropland, other types of vegetative cover within the Project boundary are: pasture (20.2 percent), planted grassland (5.0 percent), wetlands (4.3 percent), hayland (3.5 percent), maintained yards of farmsteads (2.8 percent), rangeland (1.4 percent), and woodland (1.7 percent). Unvegetated areas such as gravel pits, roads, stock ponds, and utilities all make up small percentages (all less than 0.5 percent) of the landcover within the boundary.

Along the revised 115 kV transmission line route, the majority of the route is in cultivated cropland (54.0 percent). In addition to cultivated cropland, other types of vegetative cover along the route are: pasture (20.8 percent), planted grassland (2.9 percent), wetlands (3.9 percent), hayland (6.0 percent), maintained yards of farmsteads (1.7 percent), rangeland (2.3 percent), and woodland (6.9 percent). Unvegetated areas such as gravel pits (1.2 percent), roads (0.1 percent), and utilities (0.2 percent) make up small percentages of the landcover along the route.

### **B. Homes, Businesses and Persons Displaced**

Neither residences nor businesses will be displaced due to construction of the wind farm facilities. The minimum distance between any occupied residence and a turbine is 1,205 ft. There are twelve occupied residences within 1,000 ft of the revised proposed centerline of the 115 kV transmission line. The 115 kV transmission line route has been designed to avoid and minimize direct impacts to occupied residences, and there will be no displacement of residences or businesses due to its construction.

Although the turbines may be shifted or added within leased lands in the Project boundary, in no cases would turbines be moved closer than 1,100 ft to an occupied residence.

### **C. Effect on Land Use**

Construction of the Project (both the wind farm facility and the 115 kV transmission line) will result in temporary and permanent impacts to existing vegetation within the Project area. Direct permanent impacts will occur due to construction of the WTG foundations, access roads, overhead collection and transmission lines, SCADA, meteorological towers, SODAR unit, O&M facility, and Project substations, and will be confined mainly to areas in agricultural use. These impacts will result in a loss of production of crops and pasture grasses. Other indirect impacts could include the spread of noxious weed species resulting from construction equipment introducing seeds into new areas, or erosion or sedimentation due to clearing ground in the construction areas.

Vegetation communities most sensitive to disturbance are undisturbed native prairies (not present within the Project area), rangelands with native plant communities, wetlands, and natural woodlands. Turbines, access roads, collection lines and the 115 kV transmission line have all been sited to avoid sensitive habitats to the extent possible. Where avoidance is not possible, siting will attempt to minimize impacts to these sensitive habitats.

Temporary impacts will be mitigated through the previously mentioned BMPs such as re-vegetation and erosion control devices. These measures will minimize any temporary impacts to vegetative communities adjacent to the turbine and road sites. Noxious weeds will be controlled using weed control measures such as re-vegetating as soon as possible after construction with certified weed free seed mixes, and controlled spraying as necessary.

The Project will have temporary impacts to approximately 25.1 acres of CRP land, and will permanently convert approximately 1.4 acres of current CRP land to wind energy uses. Approximately 100 square feet of CRP land will be permanently affected by the 115 kV transmission line.

### **D. Local land Use Controls**

The majority of the Project will be constructed on agricultural land regulated by Brookings County, South Dakota. Applications will be made for a Conditional Use Permit, a Soil Erosion & Sediment Control Plan, Building Permits and Driveway Application and Construction Permits. Brookings County also requires each turbine tower have a 9-1-1 identification sign (maximum size is 16 ft<sup>2</sup>) for emergency response teams to locate specific turbines within the Project. Project components will be placed and the Project will be constructed in accordance with Brookings County setback requirements.

Although there are currently no wind farm facilities proposed in Deuel County, the Applicant will coordinate and comply with Deuel County Ordinances if the final layout includes proposed turbines or other facilities within Deuel County. As part of this process, the Applicant will work with the County to ensure that any Project facilities comply with setback distances and any other local requirement.

Spence/Carter's evidence at the hearing did not demonstrate any special circumstances unique to them upon which the Commission could base a finding that they should be afforded a special set back requirement applicable only to them. The evidence at the hearing established that in

enacting its residential set back requirements in the 2007 Revised Zoning Ordinance of Brookings County, Article 23, the Brookings County Commission did extensive research into residential set back requirements of other jurisdictions in the United States. The evidence further demonstrated that the 1000 foot set back requirement of the ordinance is more stringent than most other set back standards in effect at the time the ordinance was enacted. The Commission finds that there is not sufficient evidence in this record upon which the Commission could establish a general residential set back requirement for the project more stringent than that established in the 2007 Revised Zoning Ordinance of Brookings County, Article 23.

Applicants' turbine 91, along with four other turbines, is located on a parcel of Section 11 of T112N, R49W, Brookings County, owned by Bob and Jan Roelofson. Applicants' evidence demonstrated that due to wake effects and property set back requirements, it would not be feasible to relocate turbine 91 to another location on the Roelofson's property in Section 11. If turbine 91 is not permitted to be located at its currently proposed location, the Roelofsons would be required to forego that portion of the development opportunity on their property and the resulting income from such development.

The Commission finds that the residential set back requirements as contained in the 2007 Revised Zoning Ordinance of Brookings County, Article 23 provide a reasonable level of protection for residents in the project area and a reasonable accommodation between the interests of non-leasing residents in the area and the interests of Applicant and landowners in the area who will benefit from the project.

#### **VIII. Noise**

The Applicant shall comply with the more stringent of the Brookings or Deuel County noise ordinance, as applicable, or a residential noise standard of 50 dBA, including constructive interference effects, at existing off-site residences, businesses and public buildings. The Brookings County Zoning Ordinance Section Article 23, Wind Energy System (WES) Requirements, section 12 Noise states "noise levels shall not exceed 50 dBA, including constructive interference effects at existing off-site residences, businesses and public buildings." (Brookings County Planning and Zoning, 2007). The Deuel County Zoning Ordinance 1215 WES Requirements (Deuel County Planning Commission, 2004) states noise levels shall not exceed 50 dBA at the property line of unleased land.

Based on the Applicant's analysis, the maximum predicted turbine-generated noise level at an occupied residence is approximately 48 dBA, lower than the limit of 50 dBA.

At the hearing, Applicant presented evidence that its proposed turbine 91, the closest wind turbine to the Spence/Carter, would be 1,355 feet from Intervenors' home. Although Spence/Carter questioned whether this distance was accurate, Spence/Carter produced no specific evidence as to the method they utilized to conclude that the turbine was closer than 1355 feet or the exact distance their measurements revealed. The Commission finds that the nearest turbine to the Spence/Carter home, proposed turbine 91, will be approximately 1,355 feet from their home.

At a distance of 1,355 feet from Spence/Carter's home, turbine 91 will be 355 feet or 35.5% beyond the minimum residential set back requirement of the 2007 Revised Zoning Ordinance of Brookings County, Article 23.

Exhibit IE, Appendix F, Applicants' Turbine Noise Analysis Technical Memo, demonstrated that utilizing the noisiest turbine type that will be used for the project, the MWT 95, the noise level at the Spence/Carter home should not exceed 42 – 43 dBA. If another turbine design is used at that location, the noise level would be less than that. This projected noise level is well below the 50 dBA level established for residential noise by the 2007 Revised Zoning Ordinance of Brookings County, Article 23.

Spence/Carter argued and presented evidence that Applicant's noise modeling may not accurately predict the noise levels to be experienced at their home. Spence/Carter's evidence, however, offered only general information from two on-line articles concerning potential health effects of turbine noise and did not present an alternative specific analysis of noise propagation nor a projected noise level at their home from turbine 91. Condition 21 requires Applicant to conduct post-operation field surveys for noise compliance at the request of the Commission, and if the residential noise standard is exceeded, Applicant will be required to take necessary corrective action.

#### **IX. Radio and Television Interference**

Although not anticipated, if after construction, the Applicant receives information that shows television or radio interference caused by operation of the Project in areas where good reception is presently obtained, the Applicant shall resolve such problems on a case-by-case basis.

#### **X. Aesthetics**

The existing landscape can be described as open rural space with various homesteads and agricultural facilities located throughout. There also are many operating wind farms already in the general Project area.

The wind farm will have a combination of effects on the visual quality/rural character of the area. By one measure, the proposed Project could be perceived as a visual intrusion, characterized as metal structures, 80 to 100 m high at hub height, standing on formerly undisturbed ridgelines, intruding on the natural agricultural aesthetic value of the landscape. On the other hand, wind farms have their own aesthetic quality, distinguishing them from other nonagricultural land uses. The wind farm will not generate noticeable increase in traffic or day-to-day human activity in the area. Therefore, the Project site will retain the rural sense and remote characteristic of the vicinity. Also although "industrial" in form and purpose, turbines are essentially "farming" the wind for energy. The proposed land use will not involve any ongoing industrial use of non-renewable resources or emissions into the environment. Although the turbines are high-tech in appearance, they are compatible with the rural, agricultural heritage of the area. While it may be true to some extent that the ability to see turbines in the background intrudes upon the purity of that experience, the same could be said of any human habitation or activity in the vicinity. Nonetheless, this may be perceived as a negative impact. As a result, the following mitigation measures shall be utilized:

- Turbines shall not be located in biologically sensitive areas such as wetlands or undisturbed native prairies.
- Turbines shall not be illuminated, except as required by FAA regulations.
- Existing roads shall be used for construction and maintenance where possible thus minimizing road construction

- Access roads created for the wind farm facility shall be located on gentle grades to minimize visible cuts and fills.
- Temporarily disturbed areas in uncultivated land shall be reseeded to blend in with existing vegetation.

## **XI. Time Schedule**

Applicant proposes construction will be complete and operational as early as December 2010. Project construction is expected to begin as early as Fall 2009. A table showing the preliminary Project schedule is included in Section 16 of the Application. All requisite final preconstruction designs shall be submitted to the Commission 30 days prior to start of Construction.

## **XII. Community Impact**

An area within one mile of the Project area is considered the affected socioeconomic environment in this analysis.

### **A. Forecast of Socioeconomic Impact**

Construction impacts to social and economic resources should be short-term. Revenue will increase for some local businesses, such as hotels, restaurants, gas stations, and grocery stores due to Project construction workers. Other local businesses such as ready-mix concrete and gravel suppliers, hardware stores, welding and machine shops, packaging and postal services, and heavy equipment repair and maintenance service providers will also likely benefit from Project construction. Impacts to social services will be unlikely because of the short-term nature of the construction Project.

Fire services for the Project area are provided by Brookings County volunteer fire departments located in White, Brookings, Volga, Estelline, Aurora, Toronto, and Astoria. Turbine access roads will improve emergency access to the Project area. Appropriate precautions, including lightning protection and grounding, will be used to minimize the creation of additional fire risk in the Project area. Upon completion of the Project, Buffalo Ridge II LLC, will provide information and on-site training to the local fire departments, and will mark each WTG with a 9-1-1 identification sign.

The affect of a wind farm on property values is not entirely known. Based, however, on various studies, no significant effects (either positive or negative) on property values are anticipated as a result of the proposed Project.

### **B. Forecast of Taxation Impact**

Property taxes, based on the value of the facility will be paid based on compliance with all applicable South Dakota and county statutes and regulations. Assuming a 2010 in-service date, Buffalo Ridge II is expected to pay approximately \$37 million in nameplate capacity and gross receipts tax over the next 20 years. In addition, Buffalo Ridge II expects to pay just over \$8 million net in sales and contractors excise tax.

### **C. Forecast of Agricultural Impacts**

Existing agricultural land will be taken out of crop and forage production by the proposed Project, primarily areas around WTG foundations, access roads, and electric collection and

interconnection facilities. Agricultural activities may occur up to the edge of access roads and turbine pads. The buried underground collection system will not alter agricultural activities. The 115 kV transmission line structures will be placed near the field edge, minimizing impacts to agriculture. It is estimated that approximately 67 acres of tilled agricultural land will be permanently impacted, which constitutes less than 1 percent of the total cultivated cropland in the Project area, and less than 0.1 percent of the total 418,115 acres of cropland in Brookings County. The magnitude of the loss of farmland is small relative to the total acres of farmable acreage in the county.

#### **D. Forecast of Employment, Population and Resulting Community Impacts**

Project wind farm construction crews will total nearly 82-102 personnel at peak, with an additional 28 personnel needed for installation of the 115kV transmission line. The estimated monthly payroll will be approximately \$1 million to \$1.5 million during the peak construction period for the wind farm portion of the Project. The monthly payroll will be approximately \$250,000 to \$400,000 during the peak construction period for the 115 kV transmission line portion of the Project. Construction workers will likely reside in nearby houses or motels. All construction work is anticipated to be completed as early as December 2010. Thus, no long-term impact from construction to the socioeconomics of the area is expected; any short-term effects likely will be beneficial to local businesses.

Requests for proposals will be issued to qualified contractors near the Project. The Applicant anticipates a lack of local trained workforce to fill the available number of jobs. The Applicant has found, however, that hiring people with roots in the community increases the chance of satisfied employees. The Applicant will attempt, therefore, to hire employees from within the local community to the extent possible.

#### **E. Forecast of Transportation Impacts**

The Project area consists of state and county highways and local two-lane roads. Although the volume of traffic may increase during peak construction, the Project will not result in any permanent impacts to the area's ground transportation resources. There may be some improvements to gravel roads and temporary impacts to local roads during the construction phase of the Project. The Applicant will work with the South Dakota Department of Transportation, Brookings and Deuel Counties, and townships to obtain the appropriate access and use permits, as well as minimize and mitigate any impacts to area transportation.

The Project requires review by the FAA and the South Dakota Aeronautics Commission, which will assure that the Project does not cause significant impacts to air traffic. The Applicant will comply with all FAA requirements. The Applicant will provide the SDPUC a copy of the No Hazard letters received from the FAA.

#### **F. Forecast of Cultural Resources Impacts**

The Applicant will physically avoid all previously recorded potentially eligible cultural resources during Project construction and operation activities. In addition, the Applicant is conducting an inventory for and evaluation of archaeological properties that may exist within proposed construction limits. This archaeological investigation, contracted to the Archaeology Laboratory, Augustana College (ALAC), is ongoing and will be documented in a technical report to meet state and federal technical standards. The Applicant directed the ALAC to document each resource's integrity and significance and, with this information, recommend resources eligible for

listing on the National Register of Historic Places. The Applicant will make every effort to physically avoid all identified potentially eligible resources.

Should the Applicant identify a coincidence among construction or operations limits and a known resource, the Applicant will engage the appropriate agencies including the South Dakota Historic Preservation Office in writing, requesting them to review the ALAC's recommendations regarding National Register of Historic Places eligibility and work with the Applicant to resolve the coincidence.

This resolution may include, but should not necessarily be limited to, the following actions:

- Development of construction or operations measures to avoid the resource;
- Development of construction or operations best management practices to minimize impact to the resource; or
- Development of a field investigation plan to recover data from the resource that may be lost due to construction or operations activities.

### **XIII. Future Additions and Modifications**

The Applicant does not currently anticipate any additions of MW within the Project boundary within the next five years. However, it is possible that not all of the turbine locations shown in the current layout will be built within this siting docket. It is possible some of the turbine locations shown in this application will ultimately be built as part of a separate project. In that case, those turbines would be permitted for the future project through a separate siting docket.

### **XIV. Decommissioning of Wind Energy Facilities**

Buffalo Ridge II LLC has entered into up to 40-year lease agreements for placement of the WTGs and associated infrastructure with private landowners within the Project area. The Applicant's decommissioning plan has been prepared in accordance with the requirements of Brookings County Zoning Ordinance, Article 23.09. If the final layout includes infrastructure within Deuel County, decommissioning will comply with requirements of Deuel County Zoning Ordinance, Section 1215, Part 9.

Buffalo Ridge II LLC anticipates that the life of the Project will be no less than 20 years and reserves the right to explore alternatives regarding Project decommissioning. One such option may be to retrofit the turbines and power system with upgrades based on new technology, which may allow the wind farm to produce efficiently and successfully for many more years ("repowering").

In the event that Buffalo Ridge II LLC decides to decommission the Buffalo Ridge II Wind Project versus repowering, it will advise the Brookings and Deuel (if applicable) County Zoning Offices of the planned decommissioning activities. Buffalo Ridge II LLC will begin decommissioning the facility within 8 months from the time the facility ceases to operate. Decommissioning will be completed within 18 months from the time the facility ceases to operate.

Buffalo Ridge II LLC will be responsible for all costs to decommission the Project and associated facilities. To the extent that there is an industry standard, decommissioning costs are estimated to be approximately \$90,805 per turbine in current dollars. At the current scrap steel price of approximately \$230 per ton and the past 20-year historical average of \$106 per

ton, the salvage value per turbine is estimated at approximately \$79,355. (Values are based on 2008 costs, not assuming any inflation costs or other mark-up fluctuations). Therefore, it is anticipated that the total decommissioning costs of the Buffalo Ridge II Wind Farm will be essentially covered by the salvage value of recovered Project components.

Decommissioning will involve removal of all wind facilities including towers, turbine generators, transformers, overhead and underground cables, foundations, buildings, and ancillary equipment down to a depth of 4 ft below grade. All access roads will be removed unless the affected landowner provides written notice that the road or portions of the road will be retained. Any exceptions to complete removal of the Project components will be recorded with the Brookings and Deuel (if applicable) County Zoning Offices. Additionally, any disturbed surface will be graded, reseeded, and restored as nearly as possible to its preconstruction condition within eighteen months of Project decommissioning.

Applicant presented evidence at the hearing that the wind facility leases for the project will have residual value in ten years and will continue to have value as of the date when decommissioning becomes necessary and that such residual lease value, when added to the salvage value of facility assets, should be sufficient to fund necessary decommissioning as set forth in Applicants' decommissioning plan.

With respect to financial assurance of adequate funding as provided in ARSD 20:10:22:13.01. Applicant suggested that the Commission follow the model wind energy ordinance developed by the Tower Siting Group under which the Applicant would submit a decommissioning plan and Project status report ten years following the project completion date, and the Commission will then determine whether Applicant will be required to provide financial security to assure adequate funding of decommissioning in accordance with ARSD 20:10:22:13.01. The Commission adopts this suggestion and accordingly adopts Condition 24.

## **XV. Reliability and Safety**

All proposed turbine models meet acceptable reliability standards. In other words, all potential turbine types will generate electricity when sufficient wind is available. Construction and operation of the Project will have minimal impacts on the security and safety of the local populace. The following safety measures will be taken to reduce the chance of physical and property damage, as well as personal injury, at the site:

- The towers will be placed at distances away from roadways and homesteads per the applicable County Zoning requirements.
- Security measures will be implemented during the construction and operation of the Project, including temporary (safety) and permanent fencing, warning signs, and locks on equipment and wind power facilities.
- Turbines will sit on solid steel enclosed tubular towers. Access to each tower is only through a solid steel door that will be locked and accessed only by authorized personnel.
- Tower exteriors are designed to be unclimbable.
- Turbines will conform to applicable industry standards, including those of the American National Standards Institute (ANSI).
- A professional engineer will certify that the foundation and tower design of the turbines is within accepted professional standards, given local soil and climate conditions.
- All turbines will be listed in the Brookings County 9-1-1 system and Deuel County's 9-1-1 system, as applicable.

As part of the studies done for the Interconnection Agreement with Xcel Energy, the Applicant determined that the proposed 115 kV transmission line system was the optimum method of reliably transmitting the power generated by the proposed wind farm facility into the MISO grid. Factors considered in this decision included energy losses, reliability and cost. In addition, the selected option will accommodate a potential future interconnection of an additional wind project, of 170MW, utilizing the Buffalo Ridge II right of way, and transmission poles.

Proper safeguards will be implemented for construction and operation of the facility. The facility will be designed with the local, state, and National Electric Safety Code (NESC) standards. Construction crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. Sioux Valley and H-D Electric have existing transmission and distribution lines within the boundaries of the Site. During and post construction, the parties will have similar facilities which may cross or perhaps be essentially collocated. The party constructing or planning to construct in proximity to facilities of one of the other parties shall bear responsibility to contact the other party(ies) prior to construction and advise of construction plans. Industry safety procedures will be followed during and after installation of the transmission line. This will include clear signage during all construction activities. The proposed transmission line will be equipped with protective devices to safeguard the public from the transmission line should an accident occur and a structure or conductor fall to the ground. The protective devices are breakers and relays located where the transmission line connects to the substation. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation will be fenced and access limited to authorized personnel. The costs associated with these measures have not been tabulated separately from the overall facility as these measures are standard practice for the Applicant.

#### **XVI. Permits and Approvals**

The Project shall comply with all federal, state and local laws requiring permits or approvals.

#### **XVII. Waste Disposal**

Construction of windpower facilities, as with other facilities, will lead to the generation of various types of waste: packaging, equipment parts, litter, and debris generated by site clearing. Removal of such material will be accomplished in a timely manner. Similarly, ongoing operation and maintenance of these facilities will result in the generation of various waste products. This may include worn parts and packaging of new parts. All such material shall be removed from the site and managed in an appropriate manner. Operation and maintenance of wind power facilities will result in the generation of some hazardous materials; primarily used lubricating materials. All such material shall be removed from the site and managed in a manner consistent with all appropriate rules and regulations, including any necessary coordination with local and state agencies.

#### **XVIII. General**

1. The Commission finds that based upon the above Findings of Fact and the record in this case and subject to the Terms and Conditions contained in this decision, including those set forth in the Findings of Fact, the Project will (i) comply with all applicable laws and rules; (ii) not pose an unacceptable threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area; (iii) not substantially impair the health, safety or welfare of the inhabitants; and (iv) not unduly interfere

with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

2. The Commission finds that a permit to construct the Project should be granted subject to the terms and conditions contained herein, including those set forth in these Findings of Fact.

3. To the extent that any Conclusion of Law set forth below is more appropriately a finding of fact, that Conclusion of Law is incorporated by reference as a Finding of Fact.

### **CONCLUSIONS OF LAW**

1. The Commission has jurisdiction over the subject matter and parties to this proceeding pursuant to SDCL Chapter 49-41B and ARSD 20:10:22. Subject to the findings made on the four elements of proof under SDCL 49-41B-22, the Commission has authority to grant, deny or grant upon such terms, conditions or modifications of the construction, operation and maintenance of the transmission facility as it may deem appropriate.

2. To the extent that any of the above made findings of fact are determined to be conclusions of law or mixed findings of fact and conclusions of law, the same are incorporated herein by this reference as a conclusion of law as if set forth in full.

3. Administrative rules have the force of law and are presumed valid. *Fetrop v. Department of Social Svcs.*, 559 N.W.2d 883, 884 (SD 1997). An administrative agency is bound by its own rules. *Mulder v. Department of Social Svcs.*, 675 N.W.2d 212, 216 (SD 2004).

4. The Project is comprised of a wind energy facility as defined in SDCL 49-41B-2 and a transmission facility as defined in SDCL 49-41B-2.1.

5. The Application, as supplemented by responses to Staff's data requests, complies with the applicable requirements of SDCL Chapter 49-41B and ARSD 20:10:22.

6. The Project as defined herein will comply with all applicable laws and rules, including but not limited to all requirements of SDCL Chapter 49-41B and ARSD 20:10:22.

7. The Project, if constructed in accordance with the terms and conditions of this permit, will not pose a threat or serious injury to the environment nor to the social and economic conditions of inhabitants or expected inhabitants in the Project Area.

8. The Project, if constructed in accordance with the terms and conditions of this permit, will not substantially impair the health, safety and welfare of the inhabitants of the Project Area.

9. The Project, if constructed in accordance with the terms and conditions of this permit, will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

10. The Commission has the authority to revoke or suspend any permit granted under the South Dakota Energy Facility Permit Act for failure to comply with the terms and conditions of the permit pursuant to SDCL 49-41B-33.

11. Buffalo Ridge II LLC, a wholly owned subsidiary of Iberdrola Renewables, Inc., will be the permitted owner of the project.
12. The Applicant met its preponderance of the evidence burden of proof.
13. The Commission concludes it needs no other information to assess the impact of the Project to determine if the Applicant has met its burden of proof.
14. The Commission concludes that the Application and all required filings have been filed with the Commission in conformity with South Dakota law. All procedural requirements required under South Dakota law have been met. All data, exhibits, and related testimony have been filed or received in evidence at the hearing.
15. The Commission concludes the Application is supported by the Application and the documentary and testimonial evidence received in evidence at the hearing and satisfies all applicable requirements in South Dakota law.
16. The Commission concludes that the Application, as supplemented, is substantively, procedurally and legally appropriate and complete. All formatting and timing requirements have been complied with. All public hearing requirements have been met.
17. The Settlement Stipulations entered among Buffalo Ridge II and Sioux Valley, H-D Electric, and SDREA, approved by the Commission on April 15, 2009, are fully incorporated herein by this reference and are incorporated as Findings of Fact and/or Conclusions of Law as appropriate.
18. Any Finding of Fact inappropriately labeled a Conclusion of Law or any Conclusions of Law inappropriately labeled a Finding of Fact, shall be construed as if appropriately labeled.
19. The Applicant has met its burden of proof pursuant to SDCL 49-41B-22 and is entitled to a permit as provided in SDCL 49-41B-24, subject to the following.

### **TERMS AND CONDITIONS**

1. In order to ensure compliance with the terms and conditions of this permit pursuant to SDCL 49-41B-33, it is necessary for the enforcement of this Order that all employees, contractors and agents of the Applicant, to the extent of their interests, involved in this Project be made aware of the terms and conditions of this permit.
2. The Applicant will obtain all governmental permits that may be required by any township, county, state or federal agency or any other governmental unit for construction activity covered by the permit. Copies of any permits obtained by the Applicant shall be sent to the Commission.
3. The Applicant will file final WTG selection and resulting survey or studies, final laydown and site preparation location and size, final road location and specification, O&M location and specifications and final underground collector, overhead lines and substation locations and specifications, along with any other pertinent final Project information. All final preconstruction layout information shall be filed with the Commission thirty (30) days prior to construction.

4. Fifteen days (15) days prior to construction, the Applicant shall provide each landowner with the final preconstruction layout of Project facilities with information showing the location of the facilities to be placed on the landowner's land.
5. The Applicant shall file with the Commission its Storm Water Pollution Prevention Plan wherein Best Management Practices are mandated when developed and submitted to other agencies for review and/or approval.
6. The Applicant shall advise the Commission when current meteorological towers are removed and the final location of permanent towers.
7. If during construction the Applicant or its agents discover what may be an archaeological resource, the Applicant or its agents shall immediately cease work at that portion of the site, notify the Commission and the State Archaeologist or other appropriate state agency and comply with all lawful directives of the State Archaeologist or other agency. If such an archaeological resource is salvageable, the Applicant shall avoid or protect the archaeological resource. If such a discovery will require relocation of facilities, the Applicant shall file updated plans with the Commission and inform each affected landowner of the same.
8. In order to mitigate interference with agricultural operations during and after construction, the Applicant shall locate all structures, to the extent feasible and prudent, to minimize adverse impacts and interferences with agricultural operations, shelterbelts and other land uses or activities. The Applicant shall take appropriate precautions to protect livestock and crops during construction. The Applicant shall repair all fences and gates removed or damaged during construction or maintenance unless otherwise negotiated with the landowner or his designee. The Applicant shall be responsible for the repair of private roads damaged when moving equipment or when obtaining access to the right-of-way.
9. The Applicant shall take all necessary steps to mitigate damages to rangeland and pastureland. Such actions shall include but not be limited to immediate re-vegetation and weed control. These activities shall be coordinated with the landowner and county extension office to best rehabilitate affected land.
10. The Applicant shall provide each landowner on whose property the Project is to be constructed with the following information:
  - A copy of the Commission Order.
  - Detailed safety information describing (a) reasonable safety precautions for existing activities on or near Project facilities; (b) known activities or uses that are presently prohibited near Project facilities; and (c) other potential dangers or limitations near Project facilities.
  - Construction/maintenance damage compensation policies and procedures.
  - The Commission's address, web site and phone number.
  - Contact person within the company including name and phone number.
11. The Applicant shall also comply with all other terms and conditions as set forth in the Findings of Fact.
12. The terms and conditions of the permit shall be made a uniform condition of construction, subject only to an affirmative written request for an exemption addressed to the

Commission. A request for an exemption shall clearly state which particular condition should not be applied to the property in question and the reason for the required exemption. The Commission shall evaluate such requests on a case-by-case basis.

13. Before commencing construction the Applicant shall furnish an indemnity bond in the amount of Fifty Thousand Dollars (\$50,000.00) to comply with the requirements of SDCL 49-41B-38. Such bond shall name the Commission as the obligee in favor of, and for the benefit of, such townships, counties or other governmental entities whose property is crossed by the Project. The bond shall remain in effect until released by the Commission, which release shall not be unreasonably denied following completion of the construction and repair period.

14. The Applicant shall take appropriate action to mitigate dust created throughout the construction process, including but not limited to the covering of open haul trucks, use of paved roads wherever possible to access the construction site, and removal of any soils or mud deposits by construction equipment when necessary.

15. If the presence of operation of the Project causes inference with radio, television or any legal communication device, the Applicant shall take all appropriate action to minimize any such interference and make a good faith effort to restore or provide reception levels equivalent to reception levels in the immediate areas just prior to construction of the project. This mitigation requirement shall apply to home or other structures in place at the time of construction but shall not apply to any dwellings or other structures built after the construction of the Project approved in this permit has been completed.

16. If construction of any portion of the Project commences more than four years after the date the permit is granted, Applicant must certify to the Commission before construction commences that such facilities continue to meet the permit conditions. If tower locations are not used in association with this Project, they must be sited by the Commission through a separately filed application and docket.

17. The Commission shall be notified prior to any decommissioning action.

18. The Applicant shall correspond with Western Area Power Administration ("WAPA") as the Project layout is developed and as access roads and electrical crossings of WAPA's right of way are finalized. For each crossing, the Applicant shall enter into an agreement to cross WAPA's right of way with an effort made to minimize temporary impacts. As part of the agreement process, the design for each road and electrical crossing shall be reviewed by WAPA to confirm no negative impacts to its 345 kV facility will result.

19. WTGs shall be set back at least 1.1 times the total turbine height (tower height plus blade length) from the edge of WAPA's right of way.

20. Upon completion of construction, the Applicant shall submit final maps depicting the approximate location of the proposed wind turbines, access roads, and collector and feeder lines. The applicant shall also supply an "as-built" survey performed by an independent third party to demonstrate that the proposed facilities are in compliance with the setbacks required by Brookings and Deuel Counties.

21. The Applicant shall comply with the more stringent of the Brookings or Deuel County noise ordinance, as applicable, or a residential noise standard of 50 dBA, including constructive interference effects, at existing off-site residences, businesses and public buildings. The

Applicant shall, upon Commission request, conduct field surveys verifying compliance with requisite noise levels.

22. The Applicant shall seek local input to properly and effectively coordinate an emergency response plan consistent with local resources and response abilities. Upon completion, the emergency response plan shall be filed with the Commission for public availability.

23. The number of operations employees, broken out by class, shall be filed for public information upon completion of the Project.

24. In addition to the terms, conditions and requirements regarding decommissioning set forth in Findings of Fact XIV. Decommissioning of Wind Energy Facilities, within 90 days following the date ten years after the project commences operation, the Applicant shall submit a Project status report, updated decommissioning plan for the Project and financial information for Applicant in accordance with ARSD 20:10:22:13.01 for the Commission's review and approval. At such time, the Commission will determine whether Applicant shall be required to provide a bond, letter of credit, guarantee or other security to assure adequate funding is available to fully perform decommissioning obligations as provided in ARSD 20:10:22:13.01.

### NOTICE OF ENTRY AND OF RIGHT TO APPEAL

PLEASE TAKE NOTICE that this Final Decision and Order was duly issued and entered on the 23<sup>rd</sup> day of April, 2009. Pursuant to SDCL 1-26-32, this Final Decision and Order will take effect 10 days after the date of receipt or failure to accept delivery of the decision by the parties. Pursuant to ARSD 20:10:01:30.01, an application for a rehearing or reconsideration may be made by filing a written petition with the Commission within 30 days from the date of issuance of this Final Decision and Order; Notice of Entry. Pursuant to SDCL 1-26-31, the parties have the right to appeal this Final Decision and Order to the appropriate Circuit Court by serving notice of appeal of this decision to the circuit court within thirty (30) days after the date of service of this Notice of Decision.

Dated at Pierre, South Dakota, this 23<sup>rd</sup> of April, 2009.

CERTIFICATE OF SERVICE	
The undersigned hereby certifies that this document has been served today upon all parties of record in this docket, as listed on the docket service list, electronically.	
By:	<u><i>Christina J. Smith</i></u>
Date:	<u>4/23/09</u>
(OFFICIAL SEAL)	

BY ORDER OF THE COMMISSION:

*Dustin M. Johnson*  
DUSTIN M. JOHNSON, Chairman AG

*Steve Kolbeck*  
STEVE KOLBECK, Commissioner

*Gary Hanson*  
GARY HANSON, Commissioner