Sibley County Wind Project

Large Wind Energy Conversion System

Site Permit Application

Docket No. IP-6666/WS-08-208

April, 2008

Sibley County Wind Project
1631 290th Ave.
Tyler, MN 56178

Applicant
Sibley Wind Substation, LLC
1631 290th Avenue
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Sibley County Wind Project

April 24, 2008

Dr. Burl A. Harr
Executive Secretary
Minnesota Public Utilities Commission
Suite 350, 121 7th Place East
Saint Paul, MN 55101-2198

Dear Dr. Harr,

Sibley Wind Substation LLC is pleased to transmit the LWECS Site Permit Application for Sibley County Wind Project in accordance with MN Rule 7836.0500. As President of Sibley Wind Substation LLC and its authorized representive I have prepared this application for your review. It will be my role to work closely with the general contractor during the construction phase and to oversee the operation of the facility when the Park becomes operational. My experience as an owner in the Lincoln County small scale wind project comprised of seven (7) locally-owned LLCs will be invaluable in helping manage the Sibley County Wind Park. The permittee to which the site permit should be issued is Sibley Wind Substation LLC. Please do not hesitate to call me with any questions regarding this application.

Sincerely,

David D. Norgaard

David D. Norgaard
Applicant
1631 290th Avenue
Tyler, MN 56178
507.247.5672

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Section 1
Introduction

Sibley Wind Substation LLC (SWS) or "Applicant LLC" submits this application for a Site Permit to construct a large wind energy conversion system (LWECS). The project site is located in Sibley County west of the town of Winthrop, Minnesota. The project will consist of 20 megawatts of LEWCS and associated facilities. These 20 megawatts will be owned in equal interests by 10 Minnesota residents.

The Sibley County Wind Project will proceed as a Community-Based Energy Development (C-BED) project pursuant to Minn. Stat. § 216B.1612, subd. 2(f)(1). As a matter of state policy, the Legislature has identified C-BED projects as a priority for utilities that need to construct or purchase additional renewable energy generation capacity. C-BED projects such as the Sibley Wind Energy project will help Minnesota-based utilities meet renewable energy objectives which have been established by the Legislature and the Governor (Minn. Stat. § 216B.1691). The Sibley County Board has approved a Resolution supporting the Sibley County Wind project as a C-BED project (Appendix A).

Capturing wind power for the production of electrical energy produces a very low level of external impacts relative to more traditional sources of electric power generation. This Application examines potential environmental implications of the project on human and natural environments. Wind energy development presents a very low impact on society or on the natural environment due to the very manageable waste stream produced by wind turbines, the lack of air emissions and very low levels of noise associated with this form of electric energy production.

Sibley Wind Substation LLC is committed to optimize the wind resource for this project. Decisions with respect to equipment selection, site layout and spacing have been designed to make the most efficient use of the land and wind resources. Final project design decisions will be based on environmental, topographical features, available technology, and the nature of the prevailing wind resources.

The Applicant LLC will be the construction manager and in that role will be responsible for retaining the services of a general contractor and certain subcontractors for the project. The permittee will also provide the lead role in managing the ongoing operation of the wind park. Certain monitoring, maintenance and repair activity will be managed by the Applicant. Again, much of this work will be performed under contract with operations and maintenance service providers.

The principals in the Applicant LLC have ownership interests in an existing wind park in Lincoln County. In that project, the local ownership interest for each person is in a single Minnesota LLC which owns a single 1.25 MW turbine.

Any permit issued by the MPUC should be issued to the above-named Applicant LLC. The President of the LLC is David D. Norgaard. The Applicant LLC will be responsible for operating/managing the Sibley County Wind Park.

The Sibley County Wind Park is not a Large Electric Power Generating Plant (LEPGP) as defined at Minn. Stat. § 216B.2421, subd. 2 and therefore does not require the issuance of a Certificate of Need by the Minnesota Public Utilities Commission (pursuant to Minn. Stat. § 216B.243).

The project's authorized representative is David D. Norgaard. Mr. Norgaard may be contacted by U.S. mail at 1631 – 290th Avenue, Tyler, MN 56178 or by e-mail at commish5@frontiernet.net or by telephone at (507) 247-5672 or (507) 531-0075 (cell).

The power generated by the project will be sold to a Minnesota electric utility company under the terms of a Wind Generation Purchase Agreement. Applications have been submitted to certain utility companies and terms presented for preliminary review. The Applicant LLC has not come to a final agreement with any utility for the sale of its power. The Applicant LLC intends to qualify as a Community-Based Energy Development project and as such will have any Wind Generation Purchase Agreement filed with the Minnesota Public Utilities Commission.

This LWECS project will comply with the terms and conditions of the State Siting Permit which calls for projects to be developed in a manner consistent with state policies for environmental preservation, sustainable development and efficient use of resources.

Section 2
Proposed Site

2.1 Identification of Project Area

The Project site is located in Sibley County approximately 1 to 3 miles, west, and southwest of the town of Winthrop, Minnesota. The project is in the township of Cornish in Sibley County. The land is owned by local farmers, and SCWP controls the right to develop wind energy on the properties through an option-to-lease arrangement. Approximately 2,100 acres will be involved in the state permitted wind park.

The project site requested for the permit consists of parcels in the following sections: Township 112 North, Range 30 West, Cornish Township, Sibley County, Minnesota – Sections 2, 9, 10, 11, 13, 14, and 15.

2.2 Wind Characteristics in Project Area

The average annual wind speed found in the Wind Resource Analysis Program (WRAP) data reported at the Mountain Lake tower at Darfur (Appendix B) is 6.2 m/s (13.miles/hour) at 30 meters (98 feet), 6.6 m/s (14.8 miles/hour) at 50 meters (164 feet) and 7.3 m/s (16.3 miles/hour) at 70 meters (229 feet). This tower is located 50 miles southwest of the proposed site and was the closest tower available with 10 year wind data.

EAPC Architects Engineers also compiled a comprehensive analysis of a computation of the 10 year wind data from the 50 meter Meteorological (MET) Tower at Mountain Lake, Minnesota and 12 month on-site data gathered from a 40 Meter tower located within the boundary of the Sibley wind park. This data was then normalized to reflect long-term values. Finally, these results were used to generate the conclusions and details in this report in Appendix C-1 through C-3.

The EAPC report is based on data from the tower within the wind park boundary projects average wind speed of 7.6 m/s (17.1 miles/hour) at 80 meters (262 feet).

The project area is classified as a Class 3 wind site (roughly equivalent to IEC Class IIB), having average annual wind speeds in the range of 6.5 to 7.0 meters/second (m/s) (14.6 to 15.7 miles/hour) at a height of 50 meters or (164 feet).

An on-site MET tower is now installed as part of the construction process to monitor the wind resource and collecting data as of October 2007.

2.2.1 Interannual Variation

The expected annual average wind speed at the site is 7.6 m/s at an 80-meter hub height (17.1 miles/hour at 262 feet). Using ten years of computer modeling data from the 50 meter Mountain Lake, Minnesota tower and correlated to on-site Sibley Wind Park data indicates that average wind speed has a 50% probability of occurrence, and in any given year will be within 8% of the expected average wind speed about 90% of the time. (See Figure on page 4).

2.2.2 Seasonal Variation

EPAC study shows the predicted monthly average wind speeds for the site at a hub height of 80 meters (262 feet). Wind speeds are highest in January at 8.71m/s (19.47miles\hour) and lowest in July at 6.82 m/s (15.25 miles/hour) Wind speeds are the highest in spring, fall and winter months. Wind speed decreases during the summer months.

2.2.3 Diurnal Conditions

Information with respect to the diurnal variation of wind speed in the area of the project has been recorded. A representative example of the variability of wind speed over the course of a 24 hour period is presented in Appendix D. The condition exemplified indicates increasing wind speed in afternoon hours as the temperature reaches daytime highs.

2.2.4 Atmospheric Stability

Such data has not been compiled for this site as the inputs are normally not collected with on site equipment. However, it is expected to be "moderately stable" in the general area, since stability conditions for the open and relatively flat terrain in the South-central Minnesota region do not vary significantly. Storm events can occur in the area, although their intensity, frequency, and duration are not unusual. Other wind farms have been placed in similar environments.

2.2.5 Hub Height Turbulence

The turbulence intensity (TI) is measured using standard deviation of wind speeds, divided by the mean wind speed for the period of time. Durability of turbines is sometimes predicted using the turbulence intensity factor and turbine manufacturers may request TI for a site, typically from wind speeds recorded in 10-minute intervals. A calculation based on the Jeffers WRAP tower, 10-minute wind speed data at 30 meters (98 feet), yields an expected TI of 0.116 when all wind speeds are included.

2.2.6 Extreme Wind Conditions

Extreme wind speeds may occur with winds from any of the prevailing directions and may happen during any season. The possibility of a tornado exists in the project area. Wind speeds in the 200+ mph (89 m /s) ranges can occur in a tornado.

2.2.7 Wind Variation with Height

Wind variation with height can be assessed by observation of the wind shear from the Wind power law. The mathematical formula for wind shear (α) is as follows: $\alpha = \ln(V/V_o) / \ln(H/H_o)$, where V_o and H_o are wind speed and height associated with a lower height, and V and H are wind speed and height at a greater height.

Analyses of the wind shear data have shown significant variation, depending on season, direction and time of day. Based upon data collected in the WRAP report for Mountain Lake, MN, during the years 1995-2001, the average wind shear from the height of 50-70 meters is .26 (see Appendix B).

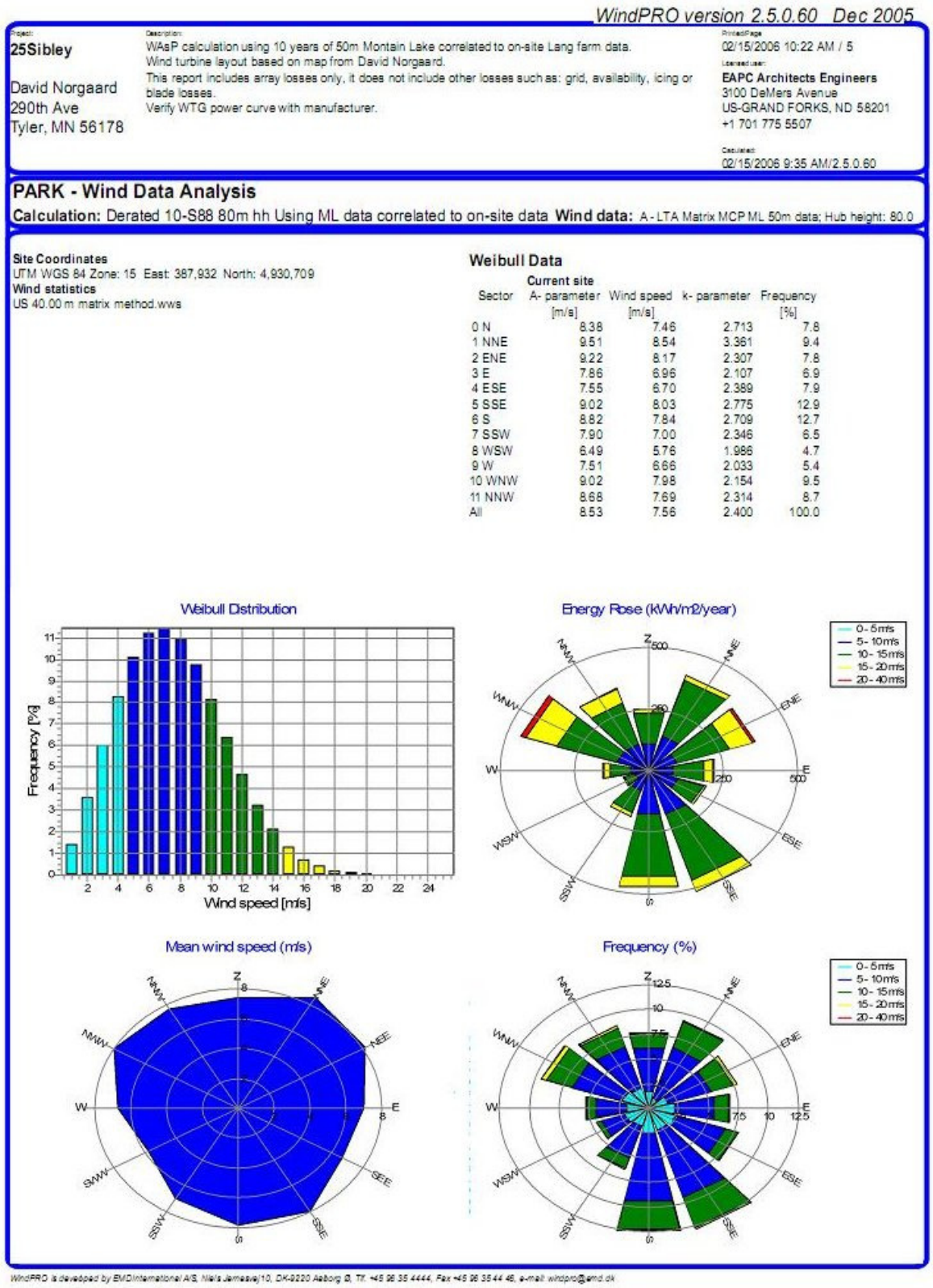
2.2.8 Spatial Wind Variation

Little wind variation exists in the project area due to the land cover of the area which is mostly farmland and void of significant tree cover.

2.2.9 The Wind Rose

The Wind Rose presented in Figure 2.2.9 presents wind direction and velocity over the course of an average year. This figure indicates that the prevailing winds are from the South Southeast and the South – with strong winds also recorded from the North Northwest and Northeast. Figure 2.2.9 also presents wind speed and frequency correlated to wind direction. The average wind speed from the prevailing South Southeast and South directions are 8.03 mph and 7.84 mph respectively. The wind is oriented from these directions 12.9 and 12.7% of the time at the proposed project site.

Figure 2.2.9


WindPRO version 2.5.0.60 Dec 2005
Project:
25Sibley
David Norgaard
290th Ave
Tyler, MN 56178
Description:
WAsP calculation using 10 years of 50m Montain Lake correlated to on-site Lang farm data.
Wind turbine layout based on map from David Norgaard.
This report includes array losses only, it does not include other losses such as: grid, availability, icing or blade losses.
Verify WTG power curve with manufacturer.
Printed/Page
02/15/2006 10:22 AM / 5
Licensed user:
EAPC Architects Engineers
3100 DeMers Avenue
US-GRAND FORKS, ND 58201
+1 701 775 5507
Calculated:
02/15/2006 9:35 AM/2.5.0.60
PARK - Wind Data Analysis
Calculation: Derated 10-S88 80m hh Using ML data correlated to on-site data Wind data: A - LTA Matrix MCP ML 50m data; Hub height: 80.0
Site Coordinates
UTM WGS 84 Zone: 15 East: 387,932 North: 4,930,709
Wind statistics
US 40.00 m matrix method.wws
Weibull Data
Current site
Sector A- parameter [m/s] Wind speed [m/s] k- parameter Frequency [%]
0 N 8.38 7.46 2.713 7.8
1 NNE 9.51 8.54 3.361 9.4
2 ENE 9.22 8.17 2.307 7.8
3 E 7.86 6.96 2.107 6.9
4 ESE 7.55 6.70 2.389 7.9
5 SSE 9.02 8.03 2.775 12.9
6 S 8.82 7.84 2.709 12.7
7 SSW 7.90 7.00 2.346 6.5
8 WSW 6.49 5.76 1.986 4.7
9 W 7.51 6.66 2.033 5.4
10 WNW 9.02 7.98 2.154 9.5
11 NNW 8.68 7.69 2.314 8.7
All 8.53 7.56 2.400 100.0
Weibull Distribution
Frequency [%]
Wind speed [m/s]
Energy Rose (kWh/m2/year)
0 - 5 m/s
5 - 10 m/s
10 - 15 m/s
15 - 20 m/s
20 - 40 m/s
Mean wind speed (m/s)
Frequency (%)
WindPRO is developed by EMD International A/S, Niels Jernesvej 10, DK-9220 Aalborg Ø, Tlf. +45 96 35 4444, Fax +45 96 35 44 46, e-mail: windpro@emd.dk

2.3 Other Meteorological Conditions at Proposed Site

2.3.1 Extreme Weather Conditions

Extreme weather conditions in this area are occasional and include hail, ice storms, lightening, tornados and severe thunderstorms. Due to the low frequency and short duration of these conditions, minimal effects are expected on turbine performance. Typical weather conditions for Sibley County are for a Temperature of 70 degrees in the summer months and 19 degrees in the winter months. Average precipitation at the two nearest measuring stations for which recorded information is available indicates 26.1 inches of precipitation annually at Redwood Falls, Minnesota (38 miles from the wind park) and 28.7 inches of precipitation annually at New Ulm, Minnesota (18 miles from the wind park.)

The average (mean) monthly temperatures at these relatively near recording stations is as follows:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Redwood Falls	12°	18°	31°	47°	60°	68°	74°	71°	62°	50°	34°	17°
New Ulm	14°	20°	34°	48°	61°	70°	74°	71°	62°	51°	35°	18°

2.4 Location of Other Wind Turbines in General Area

There are no known wind turbine projects operating within a 20-mile radius of the Sibley County Wind Project.

Section 3
Wind Rights

Sibley County Wind Project has worked with local landowners to obtain lease and easement agreements sufficient to build this 20 megawatt Project. The secured site lease and easement option agreements ensure access to the site for construction and operation of the project and prohibit landowners from any activities that might interfere with the execution of the project. The lease terms are for 20 years with provision to negotiate the extension of the lease terms to allow for continued operation of the wind park. Wind option agreements have also been obtained from property owners with land adjoining the project.

Section 4
Project Design

4.1 Project Layout

A project site map which presents the location of towers/turbines, underground cable and the project substation is presented in Appendix E-1. A project location map which indicates the general location of the project is presented as Appendix E-2 and a presentation of the project on a topographical map is presented as Appendix E-3. Turbines will be placed at a minimum spacing range of approximately 1,100 ft. to 1,500 feet in the prevailing wind direction and 685 ft to 900 ft. in the non-prevailing wind direction. (See site map for turbine locations).

Turbine locations are approximate, and are subject to change during final design. The proposed electrical collector system will be located on properties leased by Sibley County Wind Project. A newly constructed substation will be located adjacent to the 69 KV line owned by Xcel Energy running along the South side of the Park on one of the Sibley County Wind Project ("SCWP") Leased properties.

4.2 Major Wind Turbine Components

The project will consist of 10-13 wind generators built on 80-meter tall steel towers. The rotor diameter will range from 225 to 288 feet with blades are made of fiberglass-reinforced epoxy resin. Because of supply concerns and depending on who becomes involved as the equity partner, three turbine manufactures are being considered for turbine supply. The 2.0 MW Suzlon 88 turbine was used for wind modeling purposes. In the event that the Suzlon turbine cannot be installed, the Applicant LLC is also considering the installation of the Vestas 1650 kw or the Vensys 1500 kw turbines.

Other system components will be designed and installed in accordance with the standards of High-voltage engineering practice to be compatible with the specified requirements of the interconnecting area transmission system as set forth by the local transmission owners, and the reliability and operating organizations. The tower and blades have internal lighting/grounding protection.

4.3 Project Electrical System

The three turbine generators under consideration are rated at a maximum output of 690 V or less. The electric output from each generator will be transformed to 34.5 kV via pad mounted 690 V/34.5 kV transformers at the base of each turbine.

Based on preliminary design plans, power at 34.5 kV will then be collected via an underground system of cables of approximately 6.5 miles. Power cables and communication lines, if a wireless system is not used, will be buried in trenches adjacent to the project access roads on private property under agreement. The cable system will be routed to a nominally rated 60 MVA 34.5 kV/69 kV transformer at a site switchyard located in SCWP's substation, then to the point of grid interconnection on the 69kV line which runs adjacent to the substation. 34.5 kV cable will be installed to collect all of the power from the turbines and transmit it to the SCWP substation. Any aboveground feeder lines, if used, will be 34.5 kV conductor mounted on wood poles. Details will be developed in the final design.

The final electrical system design and interconnection details will be determined through discussions with Midwest Independent System Operator (MISO) and Xcel Energy. The project will meet electrical design requirements, including power factor, voltage control, and grid system protection set forth by MISO, Xcel Energy, and the purchasing utilities.

4.4 Associated Facilities

The individual wind turbines will each have a gravel access road that allows access to the wind turbines year round. These roads will be approximately 16 feet wide with class-five gravel and a fabric underlay. It is expected that the total length of access roads will not exceed three miles.

The applicant will continue to work with the landowners to reach agreements on the locations of the turbines, access roads, and collector system to minimize land use disruptions.

Foundations for the towers will be either a pad foundation of approximately 60 to 80 feet square to a depth of up to 8 or 12 feet or a Patrick and Henderson (P & H) foundation which involves a circle of concrete approximately 15 feet in diameter to a depth of 35 feet. The specific foundation will be chosen based on soil borings conducted at each tour location. A gravel pad with a radius of 80 to 100 feet will be established at the base of each tower.

An on-site MET tower has been added to the project and is now collecting Data on site and will be left for Data collection.

No operations and maintenance facility is currently planned at the wind park site. Turbine maintenance and repairs will be accomplished under the terms of an Operating and Maintenance Agreement with the turbine manufacturer for the first five years of the wind park's operation.

Section 5
Environmental Analysis

5.1 Description of Environmental Setting

5.1.1 Project Site

The project site consists of parcels in the following sections:
Township 112 North, Range 30 West, Cornish Township, Sibley County, Minnesota.
Sections 2, 9, 10, 11, 13, 14 and 15.

The land on which the wind park would be developed is in agriculture use – typically in a corn and soybean rotation.

5.2 Human Settlement

5.2.1 Demographics/Homes

The project site is a located in south-central Minnesota in Sibley County near the city of Winthrop. The primary commercial activity in the area is related to agricultural. The population of the city of Winthrop is 1280 as of 2006.

The construction of the proposed wind park will likely have little or no impact on the homes or businesses in the area. In fact, local service-related businesses will realize potential short-term benefit resulting from patronage by workers during the construction phases of the project. Additionally, the County and local government should benefit from tax revenue generated by the wind park.

The wind park will employ a local service manager for road maintenance, snow removal and management of vegetation at the site. There will also be an operating and maintenance service representative in the area to respond to operating and maintenance issues/needs of the wind park.

To further reduce any impact on local citizens, the minimum setbacks from occupied homesteads to turbines will be equal to, or greater than, those required to meet noise standards. The minimum setbacks of turbines from roads will be 76 meters (250 feet).

5.2.2 Noise

Background noise levels in the project area are typical of those in rural agricultural areas and are commonly in the low to mid-30dBA (equivalent to household level noise). These are relatively low background levels and are generally representative of the proposed site location. Higher levels exist near roads and other areas of activity such as noise associated with agricultural practices, and activities occurring in the rural town of Winthrop.

Wind turbines emit a perceptible sound when in motion. The level of this noise varies with the speed of the turbine and the distance of the listener from the turbine. On relatively windy days, the turbines create more noise; however, the noise from the wind tends to override the turbine noise as distance from the turbines increases. The project will meet noise standards issued by the Minnesota Pollution Control Agency. The impact to nearby residents and other potentially affected parties will be taken into consideration as part of the actual sighting of the turbines and setback requirements.

5.2.3 Visual Impacts

The landscape in the project site is rural open cropland with gently rolling topography. The area is characterized by agricultural fields and farmsteads. The most widely grown crops in the area are corn and soybeans. Farmsteads are often surrounded by trees planted as windbreaks.

Wind turbines will have a visual effect on the area. This impact is often based on a subjective response. Although a wind park could be perceived as an intrusion on the rural landscape, wind farms do posses a unique character all their own. Change is inevitable in our society, and over time residents adapt to the impact of this change. Population density is fairly low in the areas, therefore impacts are reduced. It is critical to also point out that residents are becoming accustomed to this new form of "farming" as several sites have gone up within neighboring counties with similar agricultural settings, and residents perceive this renewable energy as having similar characteristics to current agricultural practices. In general, the residents and local governments understand the visual impact of wind farms and are receptive to their presence. As indicated in Section 4.2, the turbines will be installed on 80 meter towers with a rotor sweep to a maximum height of 407 feet from base to tip.

The project will not generate an increase in traffic volumes or daily human activity, except for a short period of time during construction and occasionally during operation and maintenance activities. Thus the rural and remote feeling of the vicinity would be left intact.

The following mitigative measures are proposed:

- Turbines will not be located in biologically sensitive areas such as wetlands.
- Turbines will be illuminated to meet Federal Aviation Administration (FAA) regulations.
- Collector lines will be buried to minimize aboveground structures within the turbine array;
- Existing roads will be used for construction and maintenance to the extent possible.
- New access roads will be located on gentle grades to minimize visible cuts and fills.
- Temporarily disturbed areas will be converted back to cropland or otherwise reseeded to blend in with existing vegetation.

5.2.4 Public Services and Infrastructure

The proposed wind farm is expected to have minimal effects on the existing public services and infrastructure. Impacts may include the following:

- A production tax on the wind energy produced by the turbines will generate local tax revenues.
- Short-term wear and tear on local roads will occur as a result of the transport of heavy equipment and other materials. SCWP will repair any road damage occurring during the construction of the wind farm.
- SCWP is expected to create new job opportunities within the local community.
- Phones & fiber optic. The project will secure service from the local telephone provider to facilitate data transmission from each tower and to allow for voice communication to and from the wind park.

5.2.5 Archaeological, Cultural, and Historic Resources

The project has contacted the Minnesota State Historical Society and they did not indicate any known archaeological sites in the proposed project area. However, if any archaeological or historic sites are discovered in the proposed area, every measure will be taken to minimize impacts to archaeological and historic sites. The LLC is coordinating efforts with the Office of the State Archaeologist and the State Historic Preservation Office to determine whether a Phase I Archaeological Survey is to be conducted for the project. Our response from the Minnesota Historical Society and their brief report regarding Archaeological Site Locations is attached as Appendix G.

The project also notified various Native American Tribes about the proposal development in conjunction with the Federal Grant Application process through the U.S. Department of Agriculture. A copy of the letter and list of tribes to whom it was sent is attached as Appendix H.

5.2.6 Recreational Resources

There are no federal or state parks, forests or recreational areas in Sibley County. The nearest designated county or city park or recreational area is located in the City of New Ulm which is not in the immediately vicinity of the wind park. Recreational activities would not be impacted by the wind park as the turbines are located on agricultural ground. The impact to wild game should also not be significant because the wind park will be constructed in an area lacking cover to provide habitat for game animals. In addition there are no snowmobile or bike trails in the project area so the project will have no impact on this type of recreation.

5.3 Effects on Public Health and Safety

5.3.1 Air Traffic

No public-use airports are located within the proposed project area. The nearest public airport is the New Ulm Municipal Airport, located approximately 18 miles to the South. However, because there is agricultural land use within the project site, crop dusting may occur periodically. Crop dusting is typically done during the day by small aircraft. Some local aircraft applicators are familiar with application of chemicals in areas where wind turbines are sited. Turbines do not constitute any known impediment. The permanent on-site MET tower will be marked with color marking and lit at night.

5.3.2 Security

The proposed wind farm is located in a rural area with relatively low population. Construction and operation of the project would have minimal impacts on the security and safety of the local population. During the project construction period and during subsequent operation it is expected that the wind farm will have no significant impact on the security and safety of the local community of Winthrop and its surrounding area. Some additional risk for worker or public injury will exist during the construction phase, as it would for any large construction project. However, work plans and specifications would be prepared to address worker safety during the construction.

5.3.3 Microwave and EMF Assessments

The Applicant LLC will conduct a table top EMF Study to ensure that the tower sites will not interfere with microwave and VHF transmissions. The project has undertaken an assessment of microwave beam pathways to ensure that the project does not interfere with microwave paths that have been established for communications systems in the vicinity of the project.

5.3.4 Hazardous Materials

During normal operation, all fluids will be contained within the wind turbine structure. Leakage from the structures is not anticipated. Storage of fluids at the maintenance facility will be in compliance with state and federal regulations. Proper maintenance procedures and fluid-handling practices will be followed.

5.3.5 Road Traffic

Although there will be heavier traffic in the short term due to construction and on site movement of equipment, traffic will return to normal at the completion of construction. Township and County officials will receive advance notice of the construction schedule including the timing of the delivery of towers and turbines and the arrival of the crane to erect project equipment.

Wear and tear on roads will occur as a result of the transport of heavy equipment and other materials. The applicant will repair any road damage occurring during construction of the wind farm.

5.4 Effects on Land-based Economics

5.4.1 Land-Based Economics

The area in which the wind farm will be located consists of rural agricultural based farming operations, mostly row crop. There will be approximately a 10 to 12 acre land loss to roads, turbine sites and substation site for the entire time the wind park is in operation. It is anticipated that this project will contribute to the local economy by way of lease payments, production tax payments, and the acquisition of local goods and services in support of the turbine project and additional jobs to support the turbine project. There are no known mineral or gravel deposits at the project site or forest cover.

5.4.2 Community Benefits

It is likely that the Winthrop Community will experience an increase in tourism and community activities associated with the wind facility, as has proven to be true in other communities which host wind farms. Another benefit of the wind project is the generation of a production tax assessed on the wind farm, which will go directly into the local government treasury and benefit the local community, e.g. fire, police, and education.

5.5 Effects on the Natural Environment

5.5.1 Topography

The majority of Sibley County is made up of low rolling hills and agricultural land, which was once prairie. The proposed wind farm was sited in this area for its openness and ease of access. In addition to topography, land-use patterns were also considered as to provide sufficient space so that any negative impacts can be avoided.

No significant impacts on topography are anticipated. Access roads, wind turbine locations, and the proposed collector system route will not require significant cut or fill.

5.5.2 Soil

The soil in the project area consists primarily of a clay-loam. SCWP will make every effort to minimize negative soil impacts. We have contacted the local Natural Resources Conservation Service office to obtain information to prevent disturbance of any natural wetland.

SWCP will construct a plan to minimize soil erosion and re-seed any areas disturbed by construction. SWCP will be making very few changes to the landscape, and will not be affecting drainage patterns. We will also identify plans for grading, construction and drainage of roads and turbine pads as well as a comprehensive plan to restore the site after temporary project activities to minimize any surface damage. Any damage to drain tiles will be repaired or re-routed at the expense of SWCP.

Construction of the wind turbines and access roads will minimally increase the potential for erosion during the short period of construction, only a limited amount of farmland will be taken out of production.

5.5.3 Geologic and Groundwater Resources

In the proposed wind park site, the land is well-drained and tiled farmland. The foundation designs cannot be completed for the wind turbines and transformers until geo-technical core sampling has been done at each turbine site. The construction of the foundations for each wind turbine and transformers will be done without affecting the local subsurface water resources.

Impacts to geologic and groundwater resources are not anticipated. We will not be boring into the underground water table since the pad mount foundations will be 10 to 12 feet in depth. Soil borings are required to a 35 foot depth but are back filled once the soil samples are collected. Water supply needs during construction will be quite limited, and local supplies are adequate. No water will be needed for operations.

5.5.4 Surface Water and Floodplain Resources

The proposed wind farm will be built on relatively flat agricultural land and fields. The land is not located in a designated flood plain. The project will not disturb water run off areas during pre and post construction or during decommissioning. The only surface water in the project area consists of a man-made drainage ditch, which will not be affected.

The terrain affected by the project has very little surface water. The only feature in the project area is a man-made drainage ditch, which will not be affected.

Construction of wind turbines, the electrical collection lines, and access roads will only disturb approximately 20 acres of land within the project site. Access roads will be low-profile constructed so as not to impede natural drainage patterns. The collection lines will be bored under county and township roads where needed.

If construction is required across drainage ways and drain tile, it will be conducted in a manner which will avoid adverse impacts. The electrical collector system lines will be installed underground, and will not alter drainage patterns. Erosion control measures will be used throughout construction until disturbed areas have been re-vegetated.

5.5.5 Wetlands

The applicant will avoid locating any wind turbines on biologically sensitive areas such as wetlands, relic prairies, and grass ways. The Sibley County Soil and Water Conservation District has noted that there are no wetlands in the area proposed for the Sibley wind park.

5.5.6 Vegetation

The proposed wind farm will be located on land which has historically been used for row crop production. There is no known native prairie lands located in the projected site area. Tree coverage is minimal. SCWP does not foresee the removal of any trees, groves of trees or shelter belts in its present proposal. Any disturbed grasses in the right of ways will be re-seeded.

5.5.7 Wildlife

The wildlife found in the project area is typical of that found in agriculture-related habitats. The resident species are representative of Minnesota game and non-game wildlife that are associated with roadside ditches, fencerows, wetlands, and areas of non-maintained grasses and shrubs.

The projected turbine sites and roads are lacking in cover vegetation for wildlife, therefore it is anticipated that wind farm development will have minimal impact on any resident wildlife. Operation of the wind farm will not change the existing land use.

The following measures will be used to help avoid potential impacts to wildlife in the project area during selection of the turbine locations and subsequent development and operation.

- Avoid disturbance of individual wetlands or drainage systems during construction of the project.
- Protect existing trees and shrubs that are important to the wildlife present in the area.
- Maintain sound water and soil conservation practices during construction and operation of the project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored material.
- The Applicant anticipates that all project disturbances will be on crop land. It is not expected that re-vegetate with native species will be necessary. However, any disturbance to non-cropland will result in re-vegetation with native species.
- Wind turbines will be sited away from areas of large concentrations of birds and migration corridors.

Birds and Bats

Based on the history of existing wind power projects in the United States, the primary impact of concern to wildlife would be to avian and bat populations. Birds and bats have been documented to occasionally collide with wind turbines at other sites. This same potential exists in the current proposed wind farm. There are no wildlife habitat areas close to the wind park.

Fish and Mammals

Both small and large game are found within the general area of the proposed wind farm, including deer, rabbits, and ground rodents. There are no fish located in the project area. The actual site area is fully tilled farmland, which does not act as a habitat to the mammals located in the Winthrop area. Therefore, the wind farm is not expected to disturb fish and mammal numbers or habitat.

5.6 Rare and Unique Natural Features

The Endangered Species Act of 1973, as amended, requires protection of those species federally listed as threatened or endangered, as well as protection of habitat designated as critical to the recovery of those listed species. Projects that could potentially have an adverse effect on listed species or critical habitat require consultation with the USFWS.

The Minnesota DNR's NHD also maintains records of documented occurrences of state-listed species or other rare and unique species. The results of a NHD query for the Project Area search radius found that there are no known occurrences of rare species or natural communities in the area searched. (Please see Appendix F, April 1, 2008 correspondence from MDNR, Division of Ecological Services).

Section 6
Project Construction

A schedule of preconstruction, construction, and post-construction activities involved in the development of a wind energy project would list hundreds of individual tasks. In order to efficiently work through these processes, SCWP will work very closely with Southwest Wind Consulting (SWC). SWC has the team in place from previous projects and the experience of past construction on wind parks to perform all of the necessary functions that are required to bring a wind park from the inception stage to the commercial operation phase.

Immediately following the procurement of the Interconnection Agreement, and Power Purchase Agreement, the project is in a good position to move quickly with financial partners to secure equipment for the 2009-2010 construction seasons.

The Turbine Supply Agreement would be the item completed next to allow the project to be in the manufacturing queue for turbines for 2009-2010. Several manufacturers have been contacted for the turbine equipment on this project.

SWC has, as part of its team, worked with Central Engineers Group of Farmington, Minnesota to procure transformers, design the underground transmission systems, and subcontract for the installation of the interconnection system. This company will also be involved in the design and installation of the substation for interconnection to the grid system.

The soil qualification work for the SCWP project will be contracted through a Certified Engineering firm. This firm will do the soil boring necessary for the project as well as design work for the foundations and roads. American Engineering & Testing has done prelimary boring and testing of 10 possible sites with all sites coming back with good results. Boring will be required for some of the underground transmission lines as well and Engineering will also be responsible for concrete testing during and on site foundation inspection when the foundations are under construction. Local contractors in the immediate Winthrop, Minnesota area will be solicited for the road construction process. The road design will be from previous road experience and will accommodate a road matting and local aggregate combination with an over all capacity rating of 9 plus tons.

Several independent contractors will be solicited for the erection of the turbines on site. These companies may include the foundation construction, in tower wiring, erection of the tower and nacelle, and assist in the commissioning of the turbine, in their scope of work for the project. The competitive bid process will be used to determine this at a later time.

The commissioning will be a part of the scope of the tower installation team, but this team will work closely with the manufacturer to complete the turbines and get them in to commercial operation.

6.1 Construction Management

Construction management will be handled using the prior experience of SWC, and the local investors in the project. In the event the local investors were to require daily site inspection services from SWC, these are available on a per cost or lump sum basis. Other contractors may be hired for individual areas of expertise, such as civil work, electrical work, and turbine erection. The services of local contractors to assist in project construction will be secured where possible.

SWC and the local investors will also oversee the installation of roads, concrete foundations, towers, turbines and blades, electrical infrastructure, as well as the coordination of materials receiving, inventory, and distribution.

The construction team will be on-site to handle materials purchasing, construction, and quality control. An on-site project manager will coordinate all aspects of the work, including ongoing communication with local officials, citizens groups, and landowners.

6.2 Civil Works

Completion of the project will require various types of civil works and physical improvements to the land. These civil works may include improvement of existing roads, construction of access roads adjacent to the wind turbines; clearing and grading of land, trenching for, and installation of underground electric cables and communication wires, and foundation work. Improvements to existing access roads will typically consist of re-grading and filling of the gravel surface to allow access even in inclement weather. Access roads will be built adjacent to the towers, allowing access both during and after construction. The final roads will be approximately 16 feet wide with gravel cover. During construction only, those roads will be temporarily widened by an additional 16 feet of compacted soil, covered with geotextile/gravel, if required, to support the size and weight of heavy-duty cranes and turbine delivery vehicles.

The final road design will be dependant on geotechnical information obtained during the engineering phase.

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. The busiest traffic will occur when the majority of the foundation and tower assembly is taking place.

The specific turbine placement will determine the amount of roadway that will be constructed for this project. These roads will be sited in consultation with local landowners and completed in accordance with specified design requirements and will be located to facilitate both construction (cranes) and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. Roads may include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The roads will consist of graded soil, overlain with geotextile and covered with gravel. Once construction is completed, the roads will be re-graded, filled, and dressed as needed. Local requirements will be followed wherever access roads join state or local roadways.

Underground concrete foundations will be constructed to support the steel tubular towers of the turbines. Geotechnical surveys, turbine tower load specifications, and cost considerations will dictate final design parameters of the foundations. Foundations for the towers will be either a pad foundation of approximately 60 to 80 feet square to a depth of up to 8 or 12 feet or a Patrick and Henderson (P & H) foundation which involves a circle of concrete approximately 15 feet in diameter to a depth of 35 feet. The specific foundation will be chosen based on soil borings conducted at each tour location. A gravel pad with a radius of 80 to 100 feet will be established at the base of each tower.

Underground electrical cable will transmit power from the project turbines to the project substation. All electrical cable will be buried to a depth required by Minnesota Rules and the specific location of underground cables will be reported to ensure that the location of the cables can be provided upon request.

The project substation will be constructed at a central location relative to the turbine sites in order to limit the amount of cable necessary to collect the power generated by the project's turbines. The substation site is on County Road 25 – marked on the project site map (Appendix E-1).

6.3 Commissioning

The project will be commissioned after completion of the construction and testing phases. Inspection and testing occurs for each component of the wind turbines, as well as the communication system, meteorological system, the low- and high-voltage collector system, and the SCADA system. These commissioning procedures ensure that the generation units are performing to guaranteed levels and that the project meets electrical system requirements. The turbine manufacturer will provide technical engineers to assist in the commissioning process. The engineers from the turbine manufacturer will continue until the turbine is capable of more than 72 hours of continuous operation.

Section 7
Project Operations and Maintenance

7.1 Project Operations

Applicant will enter into a contractual agreement with the turbine manufacturer to provide service and maintenance for the project at least through the warranty period given by the manufacturer. Thereafter, Applicant will contract with a qualified contractor for service and maintenance for the project. The service and maintenance activities will be performed by qualified technicians, trained specifically on this type of wind turbines. Applicant may choose to use a qualified operations manager. The applicant has not made a determination at this time if service and maintenance will be performed in-house or under contract with a qualified service provider. The operations manager will oversee the maintenance and service program, ensure utility interconnection and respond to turbine outages. The operations manager will be responsible for all management, administration, service and maintenance activities. After the initial warranty period, Applicant and the manufacturer may elect to take over service and maintenance duties.

On-site service and maintenance activities include routine inspections, regular preventive maintenance on all turbines and related facilities, and unscheduled maintenance and repair. Routine minor maintenance on the wind turbines, electrical power system, and communications system may include maintenance of oil levels and filters, tightening of bolts, minor electrical Repairs, upgrading of computer software, and system testing. Civil maintenance includes maintaining project structures, access roads, drainage systems, and other facilities. The third party may also provide labor, services, consumables, and parts required to perform scheduled and unscheduled major maintenance on the wind farm, including repairs and replacement of parts and removal of failed parts.

The O&M technicians will be equipped with all necessary tools, instruments and spare parts to accomplish service, repairs and project/site operational control. Spare parts in relation to the electrical infrastructure will also be maintained based on similar historic project demands. The project staff will be complemented with the necessary service vehicles—light trucks, boom trucks, cranes, etc.—to ensure timely response. Turbine maintenance will be accomplished as an on-going cyclical function during the project lifetime, so as to minimize downtime. Transformer and pole-line maintenance will be accomplished on an annual basis and will be scheduled and performed during non- or low-wind periods.

Other maintenance activities include cooperation with wildlife studies as may be required, management of lubricants, solvents, and other hazardous materials; the hiring, training, and supervision of personnel; and the implementation of appropriate security methods.

7.2 Maintenance Schedule

During turbine commissioning and initial commercial operation, the project will be inspected on-site daily to see that it is operating within expected parameters. Following the "break-in" Period, the turbines will be remotely monitored on a daily basis with planned service and Maintenance at the following intervals:

1. ***First service inspection.*** The first service inspection will take place 1 to 3 months after the Turbines have been commissioned. Activities include tightening bolts, greasing bearings, And filtering gear oil.
2. ***Semiannual service inspection.*** Routine service inspections commence 6 months after the First inspection. The semiannual inspection consists of lubrication and a safety test of the turbine.

3. ***Annual service inspection.*** The annual service inspection consists of a semiannual inspection plus full components check.
4. ***Two-year service inspection.*** The 2-year service inspection consists of the annual inspection, plus the checking and tightening of terminal connectors.
5. ***Five-year service inspection.*** The 5-year inspection consists of the annual inspection, an extensive inspection of the wind braking system, the checking and testing of oil and grease, A balance check and the tightening of terminal connectors.

Section 8
Costs

Specific cost information is confidential to the business of SCWP. Final costs for the project have not yet been confirmed. Based on previous experience, Southwest Wind Consulting, a service provider to wind projects in the state, estimates that the installed capital cost for wind park design and construction will be approximately $2,100.00 per kilowatt. Operating costs are expected to be about 2 percent of the capital costs per year.

The actual cost of the project will not be known until final design, procurement, construction, and contractual arrangements are complete. Power Purchase Agreement Applications are in place or under way with both GRE and Xcel Energy.

Section 9
Project Schedule

9.1 Land Acquisition
Applicant has entered into land leases and wind rights options for all of the property required to support the Project. The applicant anticipates exercising land leases and remaining options by fall 2008 or winter 2009.

9.2 Permits
Applicant will be responsible for completing all required environmental review and obtaining all required permits. The objective is to obtain a LWECS Site Permit in July, 2008. Any additional required permits will be obtained prior to construction.

9.3 Equipment Procurement, Manufacture, and Delivery
SCWP will order the wind turbine components as soon as practicable. Delivery of the turbines is anticipated within 4 to 12 months of the order. The transformer for the substation will arrive within approximately 6 months after ordering. Collector system cable will arrive approximately 4 months after ordering. Once the Power Purchase Agreement and Interconnection Agreement are obtained, financial members are in place to make this portion of the wind project move forward in an expeditious manner.

9.4 Construction
It is estimated that the construction and commissioning phase will take approximately seven months to complete. Construction will likely commence in 2008 with completion expected by December, 2010.

9.5 Financing
SCWP is responsible for financing predevelopment, development, and construction activities. SCWP is financing the cost of predevelopment activities through internal funds. Permanent financing is being arranged with partner investors and will be completed prior to commercial operation.

9.6 Expected Commercial Operation Date
Applicant anticipates that the wind project will begin operation no later than Dec 2010.

Section 10
Energy Projections

A preliminary analysis of the net energy output based on turbine types and locations indicate that approximately 61,174 MWH (67,971 MWH gross) will be delivered annually to the point of interconnection. Final energy estimates will be developed once the wind farm final design is complete.

An EAPC Engineering prediction interval study of the gross energy production from the SCWP park site was conducted on February 15, 2006. Using the on-site MET tower data and 10 years of Mountain Lake correlated 50 Meter MET Tower data, EAPC concluded that the gross energy production from this site is estimated at a 38.8% capacity factor. Therefore a reduction from this number of 3.8% to include for such losses as array, grid, icing, blade and availability would be considered reasonable, and should provide for as accurate a calculation as can be obtained from a virtual MET tower setting. This results in a capacity factor for this wind park of plus 34.9% modeling the Suzlon S88 2.0 megawatt machine, and is the capacity factor being used for both the financial and tower manufacturer proforma assumptions.

Section 11
Decommissioning and Restoration

At the end of commercial operation, the Sibley County Wind Project owners will be responsible for removing wind facilities, and removing to a depth of 48" the turbine foundations. SCWP reserves the right to extend options instead of decommissioning at the end of the site permit term. These options may include applying for an extension of the site permit, if necessary, and continuing operation of the project. In this case, a decision may be made on whether to continue operation with existing equipment or to retrofit the turbines and power system with upgrades based on newer technologies. An Escrow Account for decommissioning will be set up to collect monies for removing the wind facility at the end of the project.

11.1 Anticipated Life of the Project

The anticipated project life is 25 years beyond the date of first commercial operation for each respective phase.

11.2 Decommissioning

The owner will be responsible for costs to decommission the project and associated facilities. In the event any wind turbine has exhausted its useful life and is decommissioned, the site will be excavated back to four-foot below grade as required by local zoning ordinances.

11.3 List of Decommissioning and Restoration Activities

In addition to any requirements under the site permit, each individual land lease requires proper decommissioning of turbines. Decommissioning of the site would include removal of turbines and related facilities. Removal of related facilities would include access roads, equipment, towers, buildings, transformers. Foundations will be removed to a depth of 4 feet below grade and buried back to grade. Additionally, any disturbed surface would be graded, reseeded, and restored as nearly as possible to its preconstruction condition.

The Applicant LLC has anticipated decommissioning and restoration costs in the project's financial performance. Beginning in the eleventh year of operation, an annual "set aside"of $5,000 per turbine is scheduled for each year of operation. This will provide a fund in the amount of at least $500,000 (plus earned interest) to pay for decommissioning and site restoration costs after 20 years of operation.

It is expected that the project will continue to operation for approximately 30 years. This additional 10 year span will offer additional interest on funds set aside for decommissioning activities. The cost to dismantle and remove the equipment involves the expense of a crane and crew to dismantle the towers and remove the concrete base to a level of at least four feet below grade – plus restoration costs. These costs are offset by the salvage value of the tower and generator.

Section 12
Identification of
Required Permits/Approvals

Signed resolutions of support have been obtained from Sibley County. See Appendix A.

A preliminary list of required permits and approvals identified for the project are shown in Table 12-1.

TABLE 12.1

Permit	Permitting Agency	Trigger	Permit Required
Federal			
Notice of Proposed Construction or Alteration	Federal Aviation Administration	Facility safety lighting	Yes
Determination of No Hazard	Federal Aviation Administration	Turbines and facility safety lighting	Yes
Clean Water Act Section 404 Permit: GP/LOP-98-MN	U.S. Army Corps of Engineers; St. Paul District Office	Discharges of dredged or fill material into waters of the United States, including their adjacent wetlands	No
Exempt Wholesale Generator Status	Federal Energy Regulatory Commission	Seeking status as an exempt wholesale generator must file with the Commission	Yes
Market-based Rate Authorization (Petitions for Rate Approval pursuant to Section 284.123(b)(2) 18 C.F.R. Section 381.403)	Federal Energy Regulatory Commission	Commissioning of the wind facility	Yes
State of Minnesota			
Site Permit	Minnesota Public Utilities Commission (PUC)	Construction of a Large Wind Energy Conversion System (LWECS) defined as a system capable of generating over 5MW	Yes
General NPDES Permit for Storm water Discharges Associated with Construction Activities	Minnesota Pollution Control Agency (MPCA)	Disturbance of greater than 1 Acre of ground.	Yes
Section 401 Water Quality Certification	MPCA	Impacts to waters of the US (Corps Section 404 permit)	No

Permit	Permitting Agency	Trigger	Permit Required
Very Small Quantity Hazardous Waste Generator License	MPCA	Generation more than 100 pounds of hazardous waste each year	No
Above-ground Storage tank (AST) Notification Form	MPCA	Any above-ground petroleum storage tank 500 gallons or greater	No
License for Crossing Public Lands and Waters	Minnesota DNR	Any wind farm facilities that require crossing of or location on State administered Public Lands or Waters	Yes
Public Waters Work Permit	Minnesota DNR	Any construction activities that impact waterways, including Wetlands, applies to public waters that are identified on DNR public waters inventory maps	Yes
Wetland Conservation Act Compliance	Sibley County Soil & Water Conservation District – MN Board of Soil and Water Resources (rules)	Construction activities that impact non-state wetlands	Yes
Well Construction Notification	Minnesota Dept. of Health (MDH)	Installation of private well(s) for O&M building	No
Highway Access Permit	Minnesota Dept. of Transportation	Access to State roads from wind Farm facilities.	No
Utility Access Permit	Minnesota Dept. of Transportation	Utility construction impacts to state roads	No
Oversize & Overweight Permit	Minnesota Dept. of Transportation	Use of oversize and overweight vehicles	Yes
Local			
Sibley County	Conditional Use	Met. Tower Permit	Yes
	Foundations and Buildings		No
	Access Roads		Yes
	County Road use		Yes
	Township right of way		Yes
City of Winthrop	Zoning variance	Not Needed	NO