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February 5, 2010

VIA ELECTRONIC FILING

Dr. Burl Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 5510

Re: In the Matter of the Application of Oak Glen Wind Farm, LLC for a Site Permit for a 44 MW Large Wind Energy Conversion System Project in Steele County, Minnesota
MPUC Docket No. _____

Dear Dr. Haar:

Oak Glen Wind Farm, LLC ("Applicant"), a Minnesota limited liability company, hereby e-files its application for a site permit ("Application") pursuant to Minnesota Statutes § 216F.04(b) and Minnesota Rules chapter 7854 for a 44 MW large wind energy conversion system to be located in Steele County, Minnesota ("Project"). Applicant is proposing to construct the Project before the end of 2010 and respectfully requests expeditious review of the Application.

For questions concerning this Application, please note the following contact information for the Applicant:

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Senior Project Executive
Avant Energy Inc. Agent for the MMPA,
Sole Member of Oak Glen Wind Farm, LLC.
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A copy of this letter and the complete Application are being served upon those persons on the attached service list, including representatives of the Department of Commerce Office of Energy Security ("OES") and the Attorney General's Office.

LINDQUIST & VENNUM P.L.L.P.

February 5, 2010

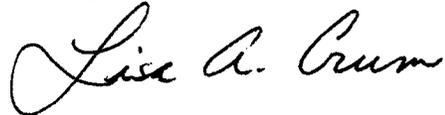
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As requested by the OES staff, five (5) hard copies of the Application and a CD containing an electronic version of the Application are being delivered to the Office of Energy Security.

Applicant understands that pursuant to Minnesota Rule 7854.1500 an initial fee payment shall be due upon notification from the OES.

Thank you for your consideration.

Very truly yours,

A handwritten signature in cursive script that reads "Lisa A. Crum".

Lisa A. Crum

LAC/mls
Enclosures

cc: Attached Service List

**Docket Nos. IP-6839/WS-10-119
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**STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION**

David C. Boyd
J. Dennis O'Brien
Thomas Pugh
Phyllis Reha
Betsy L. Wergin

Chair
Commissioner
Commissioner
Commissioner
Commissioner

**In the Matter of the Application of Oak
Glen Wind Farm, LLC for a Site Permit for
a 44 MW Large Wind Energy Conversion
System in Steele County**

Docket No. IP-6839/WS-10-119

SUMMARY OF FILING

On February 5, 2010, Oak Glen Wind Farm, LLC (“Applicant”) filed an Application for a Site Permit for a Large Energy Facility with the Minnesota Public Utilities Commission pursuant to *Minnesota Statutes*, Section 216F.04 (b) (2010). The Applicant is requesting a Site Permit for an up to 44 MW Large Wind Energy Conversion System to be located in Steele County, Minnesota (“Project”), that will be sited in an orderly manner compatible with environmental preservation, sustainable development, and efficient use of resources in accordance with state policy. The Project will provide power for use by residential and business customers within the 11 Minnesota member communities of the Minnesota Municipal Power Agency (MMPA). The proposed in-service date for the Project is December 31, 2010.



SITE PERMIT APPLICATION

Oak Glen Wind Farm

Steele County, Minnesota

February 5, 2010



Prepared For:

Oak Glen Wind Farm, LLC
200 South Sixth Street, Suite 300
Minneapolis, Minnesota 55402

Prepared By:



Westwood

**Application to the
Minnesota Public Utilities Commission
Site Permit for a Large
Wind Energy Conversion System**

Oak Glen Wind Farm
Steele County, Minnesota

MPUC Docket Number: IP-6839/WS-10-119

Prepared for:

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200 South Sixth Street, Suite 300
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Project Number: 20091170

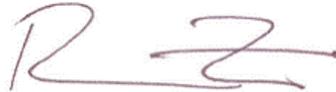
February 5, 2010

Project Name: Oak Glen Wind Farm

Project Location: Steele County: T105N, R19W, Sections 3-5, 7-10, 16-17
(Blooming Prairie Township)

Applicant: Oak Glen Wind Farm, LLC

Authorized Representative: Mr. Bruce Freeman, Senior Project Executive



Signature:

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- Exhibit 3a: GE 1.5 xle Preliminary Site Layout Map
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- Exhibit 4: Typical Landscapes within Project Area
- Exhibit 5a: GE 1.5 Preliminary Noise Modeling and Setbacks
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- Exhibit 6: Existing Wind Turbine Locations
- Exhibit 7: Infrastructure Map
- Exhibit 8: Annual Average Daily Traffic (AADT) Map
- Exhibit 9: Previously Recorded Cultural Resources
- Exhibit 10: Recreation, Wildlife, and Protected Areas Map
- Exhibit 11: Land Cover Map
- Exhibit 12: Prime Farmland Map
- Exhibit 13: Soils and Mining Resources Map
- Exhibit 14: Digital Elevation Map
- Exhibit 15: Water Features, Steep Slopes and Rare Features

APPENDICES

- Appendix A: WRAP Report – Clarks Grove
- Appendix B: Agencies Contacted Regarding Project
- Appendix C: Agency Correspondence and Responses
- Appendix D: FCC Licensed Point-to-Point Microwave Beam Paths Mapping
- Appendix E: Mapped Soil Series – Oak Glen Wind Farm Project

DEFINITIONS

AADT	Average Annual Daily Traffic
AEP	Annual Energy Production
Aggregate Surface	Road cover used for proposed access roads
ANSI	American National Standards Institute
APE	Area of Potential Effects
ASTM	American Society for Testing and Materials
BMPs	Best Management Practices; prevents soil erosion and sedimentation
BOP	Balance of Plant
Capacity	The capability of a system, circuit, or device for storing electronic charge
C-BED	Community-Based Energy Development
Phase Ia	Cultural Resources Literature Search – a large-scale review and compilation of known cultural resource data.
Phase I	Cultural Resources Reconnaissance Survey – physical inspection and identification of cultural resources within a specific area.
COD	Commercial Operation Date
Commission or PUC	Minnesota Public Utilities Commission
CON	Certificate of Need
CRP	Conservation Reserve Program
dBA	A-weighted decibel
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business
DOE	United States Department of Energy
EBH	Environmental Bore Hole
Electromechanical (or EM)	Of, relating to, or being a mechanical process or device actuated or controlled electrically; especially being a transducer for converting electrical energy to mechanical energy
EMF	Electric and Magnetic Field
EPC	Engineering, procurement, and construction
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
ft	foot/feet
GE	General Electric
Gearbox	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly
Generator	A machine by which mechanical energy is changed into electrical energy
Geotechnical	A science that deals with the application of geology to engineering

Hub	The central part of a circular object (as a wheel or propeller)
Interconnection	To be or become mutually connected
kV	kilovolt
kW	kilowatt
LGIA	Large Generator Interconnection Agreement
MAPP	Mid-Continent Area Power Pool
MW	megawatt
m	meter
m/s	meters-per-second
micrositing	The process in which the wind resources, potential environmentally sensitive areas, soil conditions, and other site factors, as identified by local, state and federal agencies, are evaluated to locate wind turbines and associated facilities.
MISO	Midwest Independent Transmission System Operator
mph	miles-per-hour
Nacelle	A streamlined enclosure (as for an engine), which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems
NESC	National Electric Safety Code
NHIS	Natural Heritage Inventory System
NLCD	National Land Cover Dataset
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O & M Facility	Operations and maintenance facility
PII	Potential Impact Index
Pitch	The action or a manner of pitching; especially an up-and-down movement
POI	Point of Interconnection
PPA	Power Purchase Agreement
Project, the	Oak Glen Wind Farm
PTC	Production Tax Credit
MCBS	Minnesota County Biological Survey
MPCU, PUC or Commission	Minnesota Public Utilities Commission
RECs	Recognized Environmental Conditions
Resistance	The opposition offered by a body or substance to the passage through it of a steady electric current
Rotor	The rotor consists of three blades mounted to a rotor hub
RD	Rotor Diameter: Diameter of the rotor from the tip of a single blade to the tip of the opposite blade
ROW	Right-of-Way

rpm	revolutions-per-minute
SCADA	Supervisory Control and Data Acquisitions (communications technology)
SHPO	Minnesota State Historic Preservation Office
Step-up Transformer	A transformer that increases voltage
Substation	A subsidiary station in which electric current is transformed
SWPPP	Storm Water Pollution Prevention Plan
TI	Turbulence Intensity – a measure of the standard deviation of wind speed over an hour, divided by the mean for the same time period
Torque	A force that produces or tends to produce rotation or torsion; also a measure of the effectiveness of such a force that consists of the product of the force and the perpendicular distance from the line of action of the force to the axis of rotation : a turning or twisting force
Transformer	An electrical device by which alternating current of one voltage is changed to another voltage
Transmission	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
WMD	Wetland Management District
WPA	Waterfowl Protection Area
WRRS	Wildlife Response Reporting System
Yaw	To deviate erratically from a course (as when struck by a heavy sea); especially to move from side to side: to turn by angular motion about the vertical axis

1.0 INTRODUCTION

Oak Glen Wind Farm, LLC (Applicant, or Oak Glen Wind), a wholly owned subsidiary of Minnesota Municipal Power Agency (MMPA), submits this Site Permit Application (Application) to the Minnesota Public Utilities Commission (MPUC) for a site permit to construct and operate the Project. The Project is a 44 megawatt (MW) wind farm consisting of up to 29 wind turbine generators in the 1.5 to 1.8 megawatt range. The Project is located in southeastern Minnesota immediately northwest of Blooming Prairie, Minnesota (**Exhibit 1**).

Associated facilities will include turbines, collection lines, a collector substation, and access roads. A permanent Met station may also be included in the project area. The only new transmission line required for the Oak Glen Wind Farm will be a 3 mile long 69kV overhead line connecting the project collector substation to the Point of Interconnect (POI). The transmission line is being planned to run along the general route of the existing Great River Energy overhead transmission lines along County Road 26 (118th Street). The collector substation also abuts this road, and MMPA is currently working with local distribution and transmission owners to accommodate the project interconnection. The POI will be at the 69kV bus located at the Transmission Owner's Ellendale 69kV switching station. The project is expected to be in commercial operation by December 31, 2010.

The Project is a Large Wind Energy Conversion System (LWECS), as defined in the Wind Siting Act, Minnesota Statutes (Minn. Stats.) § 216F.01, and a Site Permit is required for the Project under Minn. Stats. § 216F.04. A Certificate of Need application is not required due to the project's size.

Consistent with the PUC objectives, Oak Glen Wind is committed to optimizing the wind resource for the Oak Glen Wind Farm. All decisions with respect to equipment selection, site layout, and spacing are designed to make the most efficient use of land and wind resources. Oak Glen Wind will evaluate the site to optimize wind resources, transmission interconnection opportunities, and economic factors, while avoiding and minimizing impacts to human and environmental resources.

1.1 Ownership of the Proposed Facility

Avant Energy, Inc., as Agents for the MMPA, will oversee and administer all aspects of project execution including but not limited to design and construction through solicitation and award of construction contracts and third party Quality Assurance, construction monitoring oversight, and final commissioning and acceptance. Major equipment procurement including Turbine Supply Agreements will be held directly by the MMPA. Agreements for design engineering, construction and other project service providers will be between MMPA and those respective parties. Avant Energy, Inc., as Owner Representative for the MMPA, will manage those Agreements and all other aspects of the project. Contracts for design, construction, third party oversight and monitoring will be bid and awarded in phases to pre-qualified providers. The pre-qualification process is currently underway. The project as currently planned will be operated by the MMPA with vendor contracts for

equipment maintenance and service. Avant Energy, Inc. will serve as the Owners agent overseeing operation and maintenance of the facilities.

MMPA provides electricity to 11 Minnesota member communities. The agency is owned by member cities, and is governed by a board of directors. MMPA communities vary in size and location throughout the state of Minnesota. Each MMPA member is a publicly-owned electric utility, and owns the electric distribution system. Together, the 11 members provide electricity to over 57,000 households and businesses. The agency delivers and sells electricity to residential and business customers in the 11 communities. MMPA generates electricity from plants and also purchases electricity from other generators and from the Midwest Independent System Operator (MISO).

Through MMPA membership, each community has a voice in making important decisions affecting their communities' energy future. Members benefit from MMPA's collective strength in producing, buying and selling electrical power. The MMPA supports its members in helping customers conserve energy and by working to control electricity prices. MMPA strives to provide reliable, affordable, and sustainable energy to its communities. MMPA is committed to the development of sustainable energy practices including efficient energy use and generation from sustainable resources. Sustainable energy practices can reduce customers' bills, improve the environment and help mitigate global warming.

In 2006, MMPA began an ambitious project to locate wind turbines within its member communities of Anoka, Arlington, Brownton, Buffalo, Chaska, East Grand Forks, Le Sueur, North St. Paul, Olivia, Shakopee and Winthrop Minnesota. This project, titled Hometown WindPower, put 11 refurbished wind turbine generators in 11 communities in operation by the end of 2009. The project locates power generation within the community where the electricity will be used, serves the people who own their local utility, and keeps the economic and environmental benefits local.

1.2 Status of Power Purchase and Interconnection Agreements

Oak Glen Wind Farm will not require a Power Purchase Agreement (PPA) with a utility, and financing for the project is not contingent upon a PPA. The power will be for the sole use of residential and business customers within the 11 Minnesota member communities of the MMPA. Excess power may be sold back to MISO.

The Oak Glen Wind Farm has an interconnection Agreement with the Transmission Provider (ITC) and the Midwest Independent System Operator (MISO) which was executed on June 18, 2009.

The Point of Interconnection will be at the 69 kV bus located at the Transmission Owner's Ellendale 69 kV switching station. The Transmission Owner Interconnection Facilities will include those facilities and equipment owned by the Transmission Owner from the Point of Interconnection to the Point of Change of Ownership. These facilities will be located at the Transmission Owner's Ellendale 69 kV switching station.

The Point of Change of Ownership will occur at the at the end of the dead end bells connecting the Interconnection Customer's 69 kV line to the Transmission Owner's dead end structure at the proposed Transmission Owner's Ellendale 69 kV switching station. Interconnection Customer's Generating Facility collector substation facilities shall be constructed approximately 3 miles east of Transmission Owner's sub site, and the Transmission Owner's Ellendale 69 kV switching station shall be constructed at the Point of Interconnection located in Steele County, Minnesota.

1.3 Project Location and Applicant Information

1.3.1 Project Location

The Project Area is located in Steele County in southeastern Minnesota, approximately 3.0 miles northwest of Blooming Prairie, Minnesota (**Exhibit 1**). The Project is composed of approximately 3,215 acres (5 square miles), which is mostly agricultural land. **Table 1-1** below lists the Township, Range, and Section in which the Project is located.

County	Township Name	Township	Range	Section
Steele	Blooming Prairie	105N	19W	3-5, 7-10, 16-17

Oak Glen Wind will site the equipment and facilities within the 3,215-acre project area as shown in **Exhibit 2**. This will allow some siting flexibility and will provide sufficient room for buffers that may be required for avoidance of identified infrastructure and natural resources. Oak Glen Wind currently has wind rights over approximately 3,070 acres of private land within the Project Area, which is sufficient to support this 44 MW Project.

1.4 Compliance with the Wind Siting Act and Minnesota Rules 7854

The Wind Siting Act (Minnesota Statutes § 216F) requires an application for a site permit for a LWECS to meet the substantive criteria set forth in Minnesota Statutes § 216E.03, subd. 7. This Application provides information necessary to comply with these criteria and Minnesota Rules Chapter 7854. The siting of a LWECS is to be made in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources (Minnesota Statutes § 216F.03).

The Wind Siting Rules (Minnesota Rules Chapter 7854) govern the content and treatment of application for a LWECS site permit under the Wind Siting Act. To the extent available, the Applicant has presented information required by the Wind Siting Rules. In addition,

sufficient project design, wind resource, and technical information have been provided for a thorough evaluation of the reasonableness of the proposed site as a location for the Project.

1.4.1 Certificate of Need

A Certificate of Need (CON) is not required for the Project because it is a 44 MW wind farm and not a “large energy facility”, as defined by Minnesota Statute § 216B.2421, subd. 2(1).¹

1.4.2 State Policy

Pursuant to Minnesota Statutes § 216F.03, the Applicant will further state policy by siting the Project in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources. The Applicant is designing the Project and spacing turbines to maximize wind development while minimizing the impact on area land resources.

2.0 PROJECT AREA AND WIND RESOURCES

2.1 Wind Characteristics in Project Area

The wind resource across Southeastern Minnesota has been documented for more than 20 years by U.S. Department of Energy, Minnesota Department of Commerce, and public utility companies. Extensive wind measurements have been taken and synthesized by various parties. These data suggest that the long-term mean annual 80-m wind speeds across Steele County in the area of interest for the Oak Glen Wind Farm range from 7.7 to 8.1 meters per second (mps) (17.2 to 18.1 mph).

The Met tower for the project is located at 494026 East, 4862192 North, Zone 15, UTM WGS 84, and is affixed to the cellular telephone tower located on SE 123rd Street east of U.S. Highway 218. The installation currently consists of one heated and one unheated anemometer and a heated wind vane at 270 feet, an unheated anemometer and wind vane at 200 feet, and an unheated anemometer at 200 feet. Oak Glen wind has been collecting data from this facility since April 2007 at ten-minute intervals. Based on measured data, the annual average wind speed at the site is 7.97 m/s at an 82-meter hub height (17.53 miles/hour at 269 feet), which puts the site in the Class 4 wind site category. Analysis of the

¹ Under Minn. Stat. § 216B.2421, subd. 2(1), a “large energy facility” is defined as any electric power generating plant or combination of plants at a single site with a combined capacity of 50,000 kilowatts or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system.

meteorological data for the project indicates that the average monthly wind speed will be within 8% of the yearly average approximately 90% of the time.

The Minnesota Department of Commerce WRAP Report for Clark's Grove was also used in wind data analysis. Clark's Grove is located 17 miles southwest of the proposed site (UTM E473227; N4846693). Data included in this report is for a period from 1996 through 2001 at 10m, 30m, 40m, 50m, 60m and 70m (33, 98, 132, 164, 198 and 229 feet). The average annual wind speeds reported by WRAP for the Clark's Grove tower are 5.9 m/s (13.20 mi/h) at 30 meters (98 feet), 6.2 m/s (13.87 mi/h) at 50 meters (164 feet) and 6.2 m/s (13.87 mi/h) at 70 meters (229 feet).

Ground elevations in the Project Area vary only slightly from 1,331 feet above sea level in the west-central portion of the Project Area to 1,208 feet in the far southwestern corner of the site. This part of Minnesota is characterized by gently undulating ground moraine topography, with the exception of steeper topography along the banks of rivers and streams. Regional weather conditions are known to be moderately stable, with a range in temperature 0-30°F in the winter, and 60-80 °F in the summer.

2.1.1 Interannual Variation

Figure 1 below shows that the interannual variation of the Clark's Grove data gathered from the Department of Commerce WRAP Report. Average wind speeds per year were collected between 1996 – 2001 from an elevation of 70m (229 feet). The standard deviation of this dataset is 0.62 meters per second.

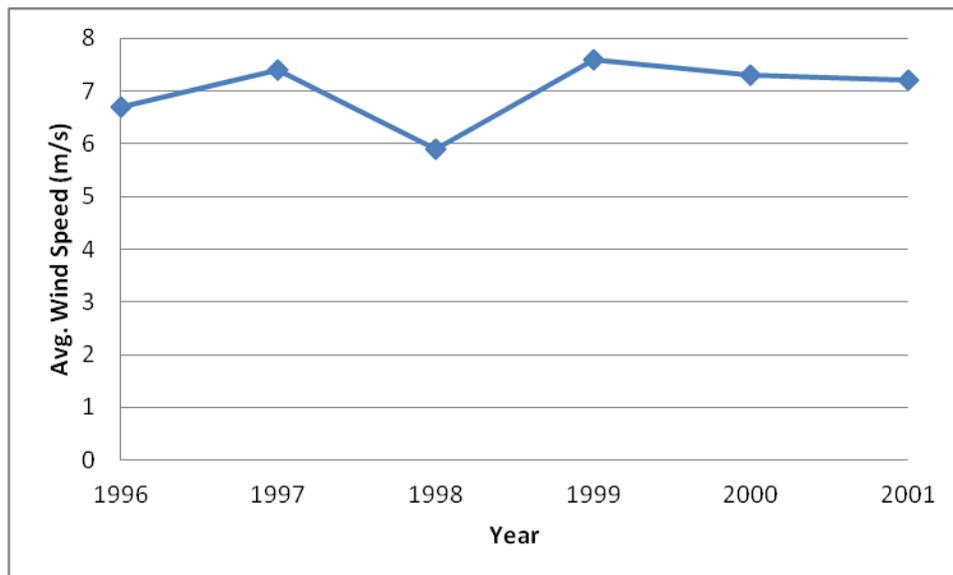


Figure 1. Interannual Variation: Clark's Grove Reference Station Annual Mean Wind Speeds

2.1.2 Seasonal Variation

Seasonal wind variations were studied using project Met tower wind data at 82 meters; the results of the studies are shown in **Figure 2**. The inter-annual wind variations in the project area are relatively small. Wind speeds are generally the highest in spring, fall and winter months and decrease during the summer months. Locally collected data shows the predicted monthly average wind speeds for the site at a height of 82 meters (270 feet). Wind speeds are highest in April at 8.74m/s (19.23mph) and lowest in August at 6.29m/s (13.84 mph).

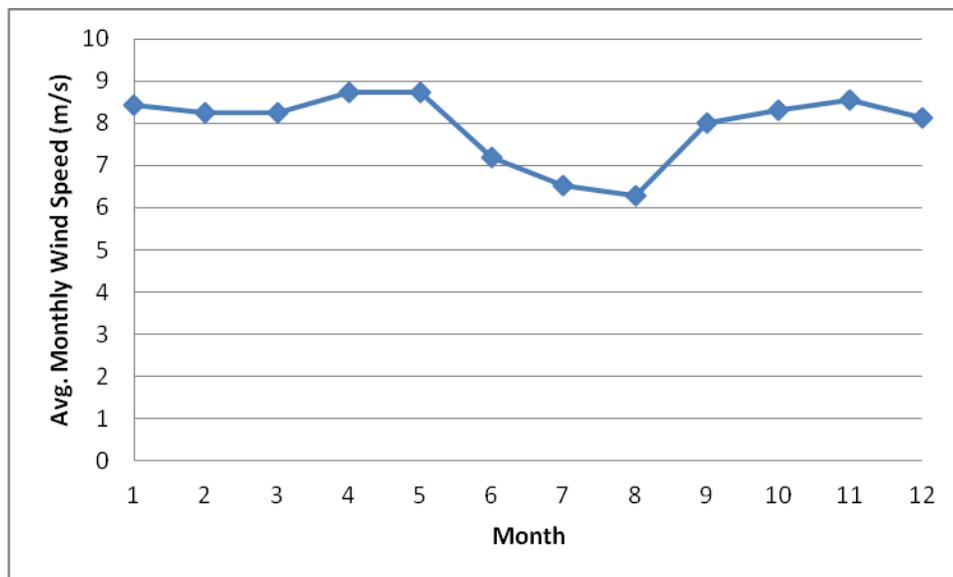


Figure 2. Seasonal Variations in Wind Speeds at 82 Meters

2.1.3 Diurnal Conditions

As shown in **Figure 3**, diurnal wind conditions are strongest between the hours of 9 pm and 4 am.

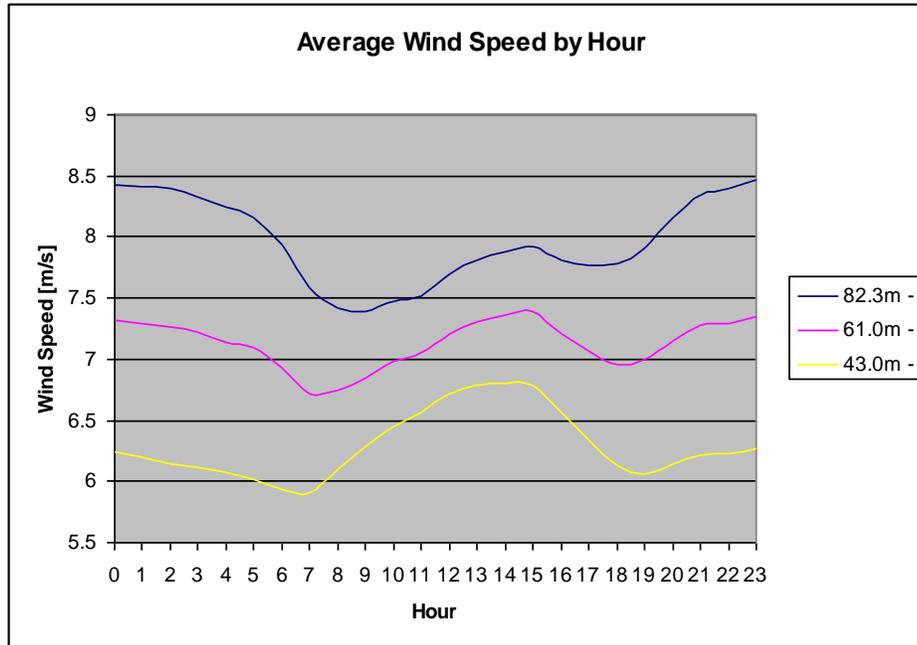


Figure 3. Average Wind Speeds by Hour in Project Area

2.1.4 Atmospheric Stability

Project specific atmospheric stability has not been calculated; however, based on other regional atmospheric data, Oak Glen Wind Farm, LLC expects the approximate atmospheric stability profile to be: Neutral (15%), Stable (70%), and Unstable (15%). These percentages were confirmed to be appropriate with the NOAA/National Weather Service Station, Chanhassen, MN.

2.1.5 Hub Height Turbulence

The turbine hub height turbulence intensity (T_i) calculation based on measured wind data from the project Met tower at 82 meters yields an expected T_i of 0.09.

2.1.6 Extreme Wind Conditions

Extreme wind data was estimated using the Extreme Wind Speed Estimator tool in WindPRO 2.6.1.252. The estimated 50-year extreme wind gust for the site area is 31.20 m/s (± 3.10 m/s), the 1 year measured max gust is 29.32 m/s, and the 1 year measured max ten-minute average speed is 22.57 m/s.

2.1.7 Wind Speed Frequency Distribution

Figure 4 shows the Weibull curve of the expected wind frequency distribution measured from the project Met tower at a height of 82 meters (270 feet).

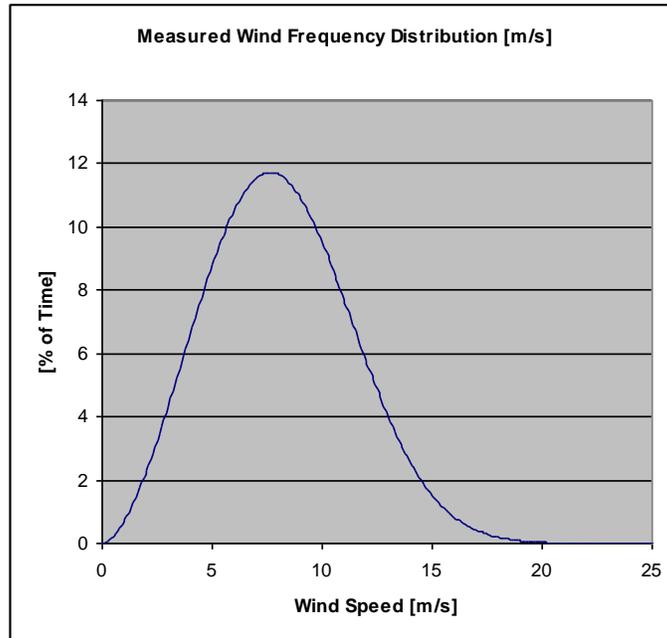


Figure 4. Expected Wind Speed Frequency Distribution and Weibull Curve

2.1.8 Wind Variation with Height

Based upon data collected in the WRAP report for Clark's Grove during the years of 1996-2001, the average wind shear ratio from the height of 50-70 meters is 0.18 (**Appendix A**). This level of wind shear is acceptable for the wind turbine models being considered for use at this site.

2.1.9 Spatial Wind Variation

Due to the relatively uniform topography of the project area, significant variation in wind speed is not anticipated.

2.1.10 Wind Rose

A wind rose is a graphical presentation that shows the various compass points, and specifies the frequency that the wind is observed to blow from a given compass point. Small-scale variations are expected at the proposed site depending on individual turbine height and exposure. The wind rose was generated from data collected at the project Met

tower. The predominant wind direction for the site is from the south, with a strong secondary component from the west by northwest. **Figure 5** shows the wind rose for the project area.

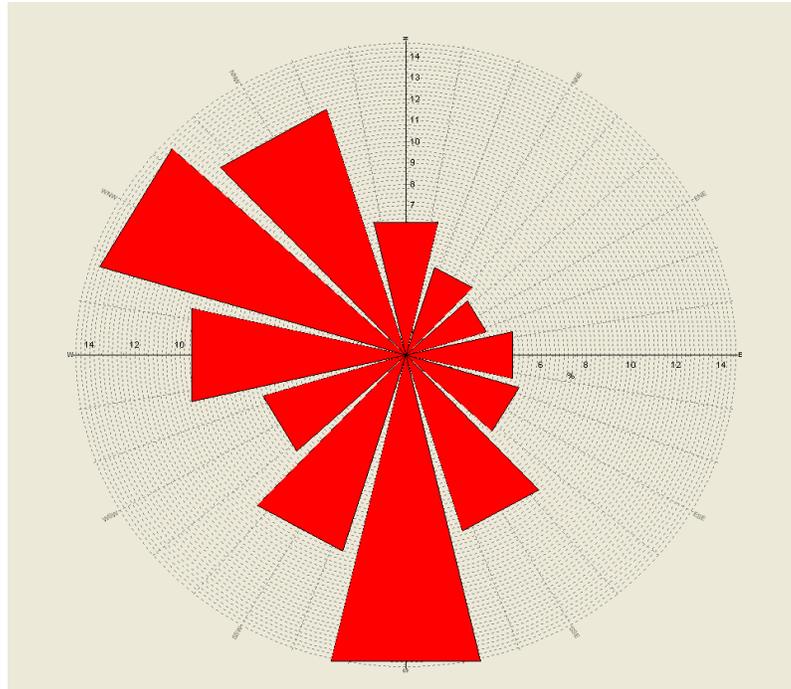


Figure 5. Measured Wind Rose at 82 Meters

2.2 Other Meteorological Conditions

Minnesota has a continental-type climate characterized by frequent occurrences of continental polar air throughout the year, with occasional Arctic outbreaks during winter and occasional periods of prolonged heat during the summer, especially in southern Minnesota when warm air moves in from the Gulf of Mexico and southwestern United States. Pacific Ocean air masses moving across the western United States allow for mild and dry weather conditions during all seasons. While the climate within the Project Area is fairly uniform due to relatively little topographic relief and lack of large water bodies, extreme weather events, such as tornados, high thunderstorm winds, high winds and blizzard conditions, do occur and are discussed further in this section.

Specific, long-term climatological data does not exist for the Project Area. However, data from a National Weather Service climate station located at the Owatonna Municipal Airport (16 miles north/northwest) was used to represent meteorological conditions at the site. The warmest month of the year is July with an average maximum temperature of 82.9 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 1.9 degrees Fahrenheit. Temperature variations between night and day tend to be moderate during summer with a difference that can reach 21 degrees Fahrenheit, and fairly limited during winter with an average difference of 19 degrees Fahrenheit. The annual

average precipitation at Owatonna is 31.64 inches. Rainfall is fairly evenly distributed throughout the year, with the wettest month being July with an average rainfall of 4.58 inches.

Extreme weather events in the Project Area have been recorded by the National Climatic Data Center (NCDC) in the US Storm Events Database for the period of time from January 1950 through August 2009. Extreme weather events during this period include tornadoes, hail, thunderstorm wind, high wind, winter storms, blizzards, extreme cold, heavy snow, excessive heat, dense fog, floods, and flash floods (among others). The NCDC recorded 223 extreme weather events in Steele County during this time period including 16 tornados, 1 high wind event, 54 thunderstorm wind events, and 4 blizzards. Typically, such storms are local in extent, short in duration, and result in damage to relatively small geographic areas.

2.3 Wind Rights

The Applicant has substantially completed securing the wind rights and easements necessary to support the Project. Within the approximate 3,215-acre Project Area, Oak Glen Wind has wind rights for approximately 3,070 acres of private land at this time. Additional landowner agreements within the project area are being pursued; however, there will likely be a small number of non-participating parcels within the project area. Current participating and non-participating parcels are shown on **Exhibit 2**. The secured easement agreements will ensure access to the Project Area for construction and operation of the Project, and prohibit landowners from engaging in activities that might interfere with the implementation of the Project. The easements allow operation in perpetuity.

Wind rights and land easements will encompass the proposed wind farm Project and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access roads, and possibly land to mitigate environmental impacts incurred due to development.

3.0 ENGINEERING AND OPERATIONAL DESIGN OF PROJECT

This section provides a summary description of the Project layout and associated facilities, wind turbines and related structures, electrical system, construction, operation and maintenance, costs, schedule and decommissioning/restoration of the site.

3.1 Project Layout and Associated Facilities

The Project will consist of up to 29 wind turbine generators in the 1.5 to 1.8 megawatt range, transformers, collection lines, a roughly 3-mile 69kV transmission line, one Project substation, access roads, and the possibility of one permanent meteorological tower. Project preliminary site layouts are shown on **Exhibits 3a and 3b**, along with the preliminary Project Substation location. Interconnection between the project collector substation and the

transmission owner's substation will be achieved via a dedicated double circuit that will be installed by GRE for the exclusive use of Oak Glen Wind Farm. The double circuit will be incorporated with the existing GRE 69kV overhead transmission facilities which currently abut the project site. Oak Glen Wind Farm is actively working with GRE, ITC and MISO to finalize the cost and design of this work which will be performed under an agreement between Oak Glen Wind and GRE. The project collector substation is within the project area and is included in this site permit application.

While turbine procurement efforts have not reached a final selection, the Project has developed two (2) preliminary site layouts for the range of wind turbines being considered. The preliminary layout in **Exhibit 3a** depicts 29 GE 1.5 MW turbines and the preliminary layout in **Exhibit 3b** utilizes 24 Vestas V90 1.8 MW turbines. Turbine locations are subject to change based upon final turbine model selection, findings of Project preconstruction surveys, specific wind data, the turbines' relative performance, final site control, and micrositing. The availability of the specific turbine model proposed, and procurement of that model may also dictate the ultimate location and placement of the generators within the project area.

The Applicant will prepare the final siting layout to optimize generation while minimizing the impact on land and other potentially sensitive resources. The topography of the site, environmental constraints, as well as the selected turbine technology will dictate turbine spacing and layout of electric collection lines. The Project engineering and operational design is summarized in the following sections of this report.

Land will be graded on-site for the turbine pads, access roads, and associated facilities. Drainage systems, access roads, and storage/laydown areas will be installed as necessary to accommodate construction, operation and maintenance of the wind farm.

3.2 Operational Design

3.2.1 Description of Turbines, Towers and Foundations

Oak Glen Wind is currently considering up to 29 wind turbine generators in the 1.5 to 1.8 megawatt range. The GE 1.5 MW xle and Vestas V90 1.8 MW wind turbines have been used for preliminary layout and performance modeling. However, as previously noted, turbine procurement efforts are still being finalized among various models and manufacturers. All turbines under consideration are three bladed, active yaw, and active aerodynamic control regulated wind turbine generators with power/torque control capabilities. The rotors utilize blade pitch regulation and other technologies to achieve optimum power output under various site conditions and wind speeds.

Oak Glen Wind Farm, LLC is currently in the process of final selection for turbine manufacturer and model. The criteria used in turbine selection are: 1) Overall performance and reliability, 2) turbine suitability for the Project's wind data, and 3) availability and cost of turbines.

The GE 1.5 MW xle and Vestas V90 wind turbines are used as representative turbines within the 1.5 to 1.8 MW range. The turbines under consideration have the same hub heights and a slight difference in rotor diameters (RDs). **Table 3-1** shows the characteristics for both turbines.

Table 3-1: Wind Turbine Characteristics		
Design Features	GE 1.5 MW xle Wind Turbine	Vestas V90 1.8 MW Wind Turbine
Nameplate Capacity	44 MW (29 units X 1.5 MW = 43.5 MW)	44 MW (24 units X 1.815 MW = 43.5 MW)
Hub Height	262.5 ft (80 m)	262.5 ft (80 m)
Total Height	397 ft (121 m)	410.1 ft (125 m)
Rotor Diameter	271 ft (82.5 m)	295.3 ft (90 m)
Design Life	Minimum of 20 years	Minimum of 20 years
Cut in Wind Speed	7.8 mph (3.5 m/s)	7.8 mph (3.5 m/s)
IEC Wind Class	IIB	IIA
Cut out Wind Speed	55.9 mph (25 m/s)	55.9 mph (25 m/s)
Rotor Speed	10.1 to 22.2 rpm (variable)	9.0 to 14.5 rpm
Distance to 50 dBA Noise Level	558 ft (170 m)	558 ft (170 m)
Power Regulation	Each turbine will be equipped with GE's patented WindVAR Control capability (active blade pitch control) and Low Voltage Ride-Thru technology (LVRT) for demanding reliability standards.	Use of microprocessor pitch control system, OptiTip and the Vestas Converter Unity System (VCUS) to operate rotor at variable speed (RPM). Unit is also equipped with low voltage ride thru technology for demanding reliability standards
Generation	690 V per turbine	690 V per turbine
Tower	Multi-coated, conical tubular steel with safety ladder to the nacelle (Rest Platforms for each 10 m of tower height)	Multi-coated, conical tubular steel with safety ladder to the nacelle (rest platforms every 9 m for height of tower)
Nacelle bedplate	Cast Iron	2 part - Cast iron front part; girder structure rear part
Main Bearings	Dual bearing main shaft to reduce axial and radial loads on the gearbox	Spherical roller bearings
Supervisory Control and Data Acquisition (SCADA)	Each turbine is equipped with SCADA controller hardware, software and database storage capability.	Each turbine is equipped with SCADA controller hardware, software and database storage capability
FAA Lighting	Standard FAA lighting	Standard FAA lighting
Foundation	Per manufacturer specifications, foundation structural engineer design, and site conditions	Per manufacturer specifications, foundation structural engineer design and site conditions

Source: http://www.gepower.com/prod_serv/products/wind_turbines/en/15mw/index.htm

Source: <http://www.vestas.com/en/wind-power-solutions/wind-turbines.aspx>

A control panel inside the base of each turbine tower houses communication and electronic circuitry. Each turbine is equipped with a wind speed and direction sensor that communicates to the turbine's control system to signal when sufficient winds are present for operation. The development site will also include an automated SCADA system located at the project substations and monitored remotely. Turbines feature variable-speed control and independent blade pitch to assure aerodynamic efficiency.

The towers are cylindrical/tapered tubular steel. The turbine towers, where the nacelle is mounted, typically consist of three to four sections manufactured from certified steel plates. Welds are typically made in automatically controlled power welding machines and ultrasonically inspected during manufacturing per American National Standards Institute (ANSI) specifications. Surfaces are typically sandblasted and multi-layer coated for protection against corrosion. Access to the turbine is typically through a lockable steel door at the base of the tower. Platforms are connected with a ladder or lift and a fall arresting safety system for access to the nacelle.

The foundations will be designed by a licensed foundation structural/geotechnical engineer in accordance with manufacturer's specifications and code requirements based upon site soil conditions and applicable load criteria (e.g. inertia, mass and aerodynamic forces). Typical foundation design include freestanding towers connected by stud races embedded in concrete or by anchor bars embedded in the foundation with high quality grout (e.g. L-flange tower base or T-flange tower base). Geotechnical surveys, turbine tower load specifications and cost considerations will dictate final design parameters of the foundations.

3.2.2 Service Roads

Each turbine will be accessible by a low profile gravel road extending from the turbine base to a public road. The roads will be all weather gravel construction and approximately 16 feet wide. To facilitate crane movement and equipment delivery, additional temporary, gravel roadways will be installed on either side of the permanent roadway. The temporary roads will be approximately 40 to 45 feet wide.

3.2.3 Setbacks

The Project has been designed to ensure consistency with setbacks established in recent LWECS site permits that have been approved by the PUC and by PUC actions.² This includes a wind access buffer of 5 RD in the prevailing wind direction and 3 RD in the non-prevailing wind direction; a noise setback meeting Minnesota Noise Standards, Minnesota Rules Chapter 7030; at least a 500-foot setback from homes (plus distance needed to meet MPCA noise standards); a 250-foot setback from public roads and recreational trails; and a 250-foot setback from roads and project boundaries for

² See *Order Establishing General Wind Permit Standards*, Docket No. E,G-999/M-07-1102, Issue Date January 11, 2008;

<http://energyfacilities.puc.state.mn.us/documents/19302/PUC%20Order%20Standards%20and%20Setbacks.pdf>.

meteorological towers. Steele County maintains a wind energy conversion system (WECS) ordinance that applies to non-commercial and commercial WECS as described below and within the Steele County Zoning Ordinance:

Non Commercial Wind Energy Conversion System: A WECS that is designed to have a capacity of less than 40 kW and having a height of less than 200 feet as measured from the ground level to the top of the blade at its highest point.

Commercial Wind Energy Conversion System: A WECS that is designed to have a capacity of 40 kW or more; or a WECS having a height of 200 feet or more as measured from the ground level to the top of the blade at its highest point; or a WECS farm consisting of four or more structures.

The setback requirements under Steele County's WECS ordinance are provided in Section 1527.04 and are as follows:

Front yard Setbacks. All WECS must be setback from the base of the tower to the road right of way a distance equal to or greater than the height of the WECS but not less than the minimum front yard setback for that district. Maximum front yard setbacks listed elsewhere in this ordinance do not apply.

Property Line Setbacks. All WECS must meet the following setbacks from property lines as measured from the base of the tower to property line.

a.) Non-commercial WECS must be setback a distance equal to or greater than the height of the WECS. b.) Commercial WECS must be setback a distance equal to or greater than 5 times the rotor diameter of the WECS. This setback may be reduced to a distance approved by the county, if the applicant furnishes evidence of an agreement with the adjoining land owner allowing a lesser setback. In no cases shall the setback be less than the height of the WECS.

Neighboring Dwellings. All WECS must be setback a minimum of 750 feet from neighboring dwellings other than the owner.

Because Steele County is not a delegated county for permitting projects between 5 and 25MW in size, in accordance with State Statute § 216F, the Minnesota Public Utilities Commission has jurisdictional authority for permitting as it pertains to this project. A letter from Steele County Planning and Zoning was received on January 27, 2010 and is included in **Appendix C**.

3.3 Related Equipment and Facilities

3.3.1 O & M Facility

There are presently no plans to construct a dedicated O&M facility in the project area. The project as currently planned will be operated by the MMPA with vendor contracts for equipment maintenance and service. Avant Energy, Inc. will serve as the Owners agent

overseeing operation and maintenance of the facilities. Maintenance and service agreements may be negotiated as part of the Turbine Supply Agreement (TSA) with manufacturers at the time of award or to other pre-qualified providers. The Faribault Energy Park owned by the MMPA is a 261 MW combined-cycle facility in southern Minnesota operated under a vendor agreement with MMPA.

3.3.2 Step-Up Transformers, Collection Lines, Substation, and POI

Oak Glen Wind will contract to have the electrical system designed by a professional, experienced and qualified electrical system design firm. The entire collection system will be designed to meet National Electric Safety Code (NESC), National Electric Code (NEC), and American National Standard Institute (ANSI), National Electrical Manufacturers Association (NEMA) and Occupational Safety and Health Administration (OSHA) standards. The design work includes a load flow analysis for the Project to ensure the facility will meet the power factor and voltage control specifications. A coordination study will determine the appropriate protective relay settings for optimum protection and selectivity for the Project's electrical system.

Power from each turbine will be fed down the tower from the generator through the power conditioning equipment and breaker panel out to a pad mount transformer. The pad mount transformer steps the voltage up to an internal collector system voltage of 34.5kV. The electricity will run through the underground collection lines to the project collector substation, and then to the Point of Interconnection (POI) on the power grid. Construction of the collector Project Substation and interconnection into the POI will be in accordance with applicable standards.

The pad mounted transformers will be configured in a loop fed, dead front arrangement. All transformers will be equipped with locking doors to prevent unauthorized entry.

The connection between the collector substation and POI will be an overhead 69 kV transmission line running approximately 3 miles along the existing right-of-way of CR-26 (118th Street); the collector substation will be located in the northwestern portion of the project area and also adjoins this road (**Exhibits 3a and 3b**). There is existing overhead transmission occupying the right-of-way, and Oak Glen Wind is working with the local distribution and transmission owners to accommodate the project interconnection.

Interconnection between the project collector substation and the transmission owner's substation will be achieved via a dedicated double circuit that will be installed by GRE for the exclusive use of Oak Glen Wind Farm. The double circuit will be incorporated with the existing GRE 69kV overhead transmission facilities which currently abut the project site. Oak Glen Wind Farm is actively working with GRE, ITC and MISO to finalize the cost and design of this work which will be performed under an agreement between Oak Glen Wind and GRE.

The Point of Interconnection will be at the 69 kV bus located at the Transmission Owner's Ellendale 69 kV switching station. The Transmission Owner's Interconnection Facilities will include those facilities and equipment owned by the Transmission Owner from the Point of Interconnection to the Point of Change of Ownership. The Point of Change of Ownership will occur at the end of the dead-end bells connecting the Oak Glen Wind 69 kV line to the Transmission Owner's dead end structure. The Oak Glen Wind collector substation shall be constructed approximately 3 miles east of Transmission Owner's substation site, and the Transmission Owner's Ellendale 69 kV switching station shall be constructed at the Interconnection point.

3.3.3 Roads and Temporary Construction Areas

Permanent service roads will be built adjacent to the towers, allowing access both during and after construction. The permanent roads will measure approximately 16 feet wide. Service roads will be designed and constructed to adequately support the size and weight of maintenance vehicles and to withstand inclement weather. The Applicant will site these roads in consultation with local landowners, and meet state and local requirements.

Specific turbine locations will determine the amount of roadway that will be required for the Project. To the extent possible, the Applicant will design and site roads to minimize the length of road required for the Project.

In general, a 50-foot diameter gravel work area centered on the base of each turbine will be needed after construction, with a slightly larger, temporary pad needed during construction to support crane work. Work areas will be located to facilitate both construction (cranes) and subsequent operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. Roads will include appropriate drainage and culverts while allowing for the crossing of farm equipment.

The roads will consist of graded dirt, overlaid with geotechnical fabric (if needed) and covered with gravel. To facilitate crane movement and equipment delivery, additional gravel roadway will be temporarily installed on either side of the permanent roadway. The temporary roads will be approximately 40 to 45 feet wide.

Turbine and rotor assembly areas, gravel crane pads, and component lay down areas extending from the access road to the turbine foundation will be constructed to specified grades and slopes with erosion and sedimentation control measures.

Temporary construction areas adjacent to the turbine pads, access roads and collection lines will be restored after construction is completed. The site will be graded to natural contours, and soils will be loosened and seeded if needed. Access roads will be regraded, filled, and dressed as needed after construction is completed.

3.3.4 Permanent Meteorological Towers

Once the Project is constructed, the Applicant may install one permanent meteorological tower within the Project Area that will remain for the duration of the Project. The permanent Met tower will be free standing and made of galvanized steel, with medium dual-intensity day and night lights as required by the FAA.

The tower would be constructed at a site selected based upon the final locations of the wind turbines and for proper operation of wind assessment equipment. The tower will contain instruments such as anemometers, data loggers, wind direction sensors, temperature probes and communication system that can be configured at various elevations. The area required to construct the Met tower is expected to be approximately 400 by 400 feet for a temporary construction easement including equipment storage, material lay down, and construction staging. The permanent impact area will be significantly smaller than the temporary easement area.

3.4 Construction

Professional design engineering firms and experienced pre-qualified trade contractors will be hired for the design and construction of the Project. Avant Energy, Inc., as the Agent for MMPA, will have overall project management responsibilities. Contracts for construction and third party testing and inspection services will be awarded for civil work, electrical work, and noise analysis and turbine erection. The services of local contractors to assist in Project construction will be considered where possible. The construction team will be on-site to handle materials purchasing, construction, and quality assurance. An on-site Construction Manager will coordinate all aspects of the work, including ongoing communication with local officials, citizens groups, and landowners.

The Construction Manager 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 permanently impacted area is considered to be only the land that will be disturbed by the exposed portions of the turbine foundations, permanent access roads, and the substation footprint. Approximately 5 to 6 acres of the Project site is anticipated to be permanently impacted. The collector system will be underground and is not considered in the permanent impact calculation.

During construction, additional areas will be temporarily impacted. Activities causing temporary disruption include the widening of access roads for equipment transport, installation of turbine foundations, installation of electrical collector and communication cables, and for staging and support purposes. Disrupted soil will be reclaimed, and temporarily disturbed areas will be restored to their previous use (e.g., agricultural use) upon turbine commissioning.

3.5 Operation and Maintenance

Oak Glen Wind Farm, LLC will pursue contractual agreements with prequalified service providers for operation and maintenance services for the project. Avant Energy, Inc., as the Owner's agent, will oversee operation and maintenance of the facilities. Maintenance and service agreements may be negotiated as part of the Turbine Supply Agreement (TSA) with the turbine manufacturer, or to other pre-qualified O&M providers. Avant Energy, Inc. will oversee all maintenance, management and service activities of the turbines and supporting facilities, ensuring utility interconnection is sound and that O&M response to turbine outages is timely.

On-site service and maintenance activities include routine inspections, regular preventive maintenance on all turbines and related facilities, unscheduled maintenance and repair, and routine minor maintenance on the wind turbines, electrical power systems, and communications systems. The O&M contractor will assess the condition of oil levels and filters, see to the tightening of bolts, repair minor electrical issues, upgrade computer software as needed, and periodically test the SCADA and other monitoring systems. Civil maintenance will include maintaining Project structures, as well as access roads, drainage systems, and other facilities.

The O&M contractor will address both scheduled and unscheduled major maintenance on the wind farm, including repairs, replacement of parts and removal of failed parts. The O&M technicians will be equipped with the necessary tools and instruments for routine service, repairs, and Project/site operational control. Turbine maintenance will be performed as an on-going function during the life of the Project. Transformer, substation, and 69-kV line maintenance will be accomplished on an annual basis and will be scheduled and performed during low or no wind periods.

Other maintenance activities include cooperation with the local governmental agencies dealing with environmental concerns, including the management of lubricants, solvents, and other hazardous materials, and the implementation of appropriate security methods.

During turbine commissioning and initial commercial operation, turbines will be inspected on-site daily to see that they are operating properly. Following the "break-in" period during the initial commercial operation date, the turbines will be remotely monitored on a continuing basis with planned service and maintenance at routine intervals recommended by the turbine manufacturer.

Site Control and Data Acquisition (SCADA) System

The Project will include a computer-controlled communications system that permits automatic, independent operation and remote supervision of each turbine and the facility collectively, thus allowing the simultaneous control of the wind turbines. Each wind turbine will be programmed to operate autonomously, and will make its own control "decisions" under normal conditions. The turbines will continuously communicate with a Supervisory

Control and Data Acquisition (SCADA) system that monitors operation and energy production. The SCADA system monitors the wind farm status and alerts operations personnel to operational conditions that require attention. The SCADA system collects data on wind turbine generation, availability, alarms and communication error information, and meteorological and communications data. Performance data and parameters for each machine can also be viewed in real time, and machine status can be changed. The SCADA system also reports and archives generation data. Design of the SCADA system is not yet finalized.

The 29 turbines will be monitored and operated remotely. Oak Glen Wind Farm, LLC may enter into contractual agreements with a third party or parties to provide off-site operations, and on-site service and maintenance for the Project.

3.6 Financing and Costs

The Oak Glen Wind project will be financed by the MMPA through various private financing resources including bond sales. Overall project cost for construction is currently projected to be \$118M. The bulk of Project costs are borne by the wind turbines. Annual operating costs of the completed project are currently under development and are contingent upon various O&M strategies which will be finalized at the time of substantial completion.

3.7 Project Schedule

Oak Glen Wind expects to begin construction of the Project in mid 2010 and plans to begin commercial operation by December 31, 2010. To accomplish this, Oak Glen Wind is acquiring wind rights and easement agreements from landowners, which should be completed by the first quarter of 2010. Oak Glen Wind expects the Site Permit to be issued within approximately six months of this Application's acceptance. Preconstruction surveys and studies are currently underway and will continue through spring 2010. Equipment deliveries and site mobilization will be initiated upon the issuance of the Site Permit and will continue through construction.

Oak Glen Wind will be responsible for undertaking all required environmental review and will obtain all project specific permits and licenses that are required following issuance of the LWECs Site Permit. The commercial operation date is dependent on the completion of permitting and other development activities.

3.8 Energy Projections

Oak Glen Wind has performed wind and energy production analysis using measurements collected at the nearby project Met tower between the dates of March 2008 and February 2009. The net annual energy production from the project is projected to be approximately

145,000 MWh (Megawatt hours). Energy estimates will be further analyzed after the final design and layout of the wind farm has been completed.

3.9 Decommissioning and Restoration

Oak Glen Wind Farm, LLC, in the agreement with landowners, identifies the term of the agreement to be effective in perpetuity. There are provisions within the landowner agreement that enable the agreements to be transferred and reassigned, and requirements which identify the obligations and assignment of assets in the event of bankruptcy or default. The project is to be owned and operated by MMPA and generated electricity is intended to serve MMPA member cities. The following provision of the Oak Glen Wind landowner agreement addresses removal of improvements:

Within forty-five (45) days after termination of this Agreement, Owner may by written notice require Oak Glen to remove all of the then remaining Improvements on the Property and reasonably restore the Property to its approximate condition prior to the installation of the Improvements, all at Oak Glen's sole cost and expense. Easement agreements include a license to enter the Property to perform such removal and restoration. Such removal and restoration obligation shall be completed within one hundred and eighty (180) days after Owner gives such written notice to Oak Glen and shall include removing footings, foundations and other structures down to a level of forty-eight (48) inches below grade and returning the grade to a condition reasonably comparable to conditions prior to Oak Glen's installation of Improvements on the Property.

The project owner and operator (MMPA) will administer this project with governance and good practice as it does its other generating assets and facilities. Over the life of the project, the Applicant will budget and maintain funds to cover decommissioning costs. Oak Glen Wind has a contractual obligation with landowners for remediation of the properties back to a condition comparable to that of the property prior to the installation of the wind project. The exact dollar amount necessary to cover decommissioning costs has not been determined at this stage in the project; however, adequate funds will be set-aside with oversight of an independent administrator of such funds on behalf of the Project. The independent administrator will report annually to the Project on the status of the decommissioning funds. The Project will establish a recurring reporting interval to provide the independent administrator with an updated budget for the cost of decommissioning the plant in current-year and in decommissioning-year dollars.

The Project decommissioning and restoration plan will be in general accordance with the requirements of Minnesota Rules 7854.0500, subp. 13. Within 18 months from the time the facility ceases to operate, decommissioning will be complete. The Applicant will be responsible for all costs to decommission the Project and associated facilities.

Decommissioning will involve removal of all above-ground wind facilities including wind turbine nacelles, blades, towers, foundations, cables, roads, and other ancillary facilities.

Oak Glen Wind shall remove footings, foundations and other structures down to a level of forty-eight (48) inches below grade and return the grade to a condition reasonably comparable to conditions prior to Oak Glen Wind's installation of Improvements on the Property. All access roads will be removed unless the affected landowner provides written notice that the road or portions of the road can remain. Additionally, disturbed surfaces shall be graded, reseeded, and restored as nearly as possible to their preconstruction condition.

Oak Glen Wind Farm, LLC requests the right to re-evaluate decommissioning alternatives at the end of the LWECS Site Permit term and to update decommissioning costs. Oak Glen Wind requests the right to re-apply for a LWECS Site Permit and continue operation of the Project upon expiration of the original LWECS Site Permit. Oak Glen Wind may also decide to retrofit, repower or replace the turbines and power system with upgrades based on new or available technology to continue to operate the Project in perpetuity.

4.0 ENVIRONMENTAL ANALYSIS

In accordance with Minnesota Rules Chapter 7854, the Applicant provides the following description of the environmental conditions of the Project Area. Oak Glen Wind has considered exclusion and avoidance criteria in selecting the Project Area, consistent with MPUC procedures on LWECS siting criteria.

Oak Glen Wind sent letters to various regulatory and governmental authorities to request review of the Project Area for applicable comments and concerns. A list of the agencies who received this letter is included in **Appendix B**. Responses from agencies that responded with comments regarding the proposed Project are discussed in the following sections. A copy of agency responses is included in **Appendix C**.

4.1 Description of Environmental Setting

The Project location is rural with an agricultural-based economy. Corn, soybeans, vegetables, forage- land (hay) and sweet corn are the predominant crops in Steele County. The County also produces livestock including: turkeys, hogs and pigs, and cattle and calves. The landscape in the Project Area is gently undulating. Typical landscape photographs of the project area are provided on **Exhibit 4**. Elevations in the Project Area range from 1,331 feet above mean sea level in the west-central portion of the site to 1,208 feet in the far southwestern corner of the site.

According to the Steele County Planning and Zoning Director, Dale Oolman, the project is situated entirely within the Agricultural Zoning District (A-1) as defined by the Steele County Zoning Ordinance. This was confirmed by reviewing online mapping for the project. As noted in Section 1528.03 of the Steele County Wind Energy Conversion System Ordinance, commercial WECS are allowed as conditional uses in the Agricultural, General Business, and General Industrial Zoning Districts. The WECS ordinance also describes

setbacks, design standards, and operational standards for commercial WECS projects. In accordance with State Statute § 216F, the Minnesota Public Utilities Commission has jurisdictional authority for permitting as it pertains to this project.

As mentioned in the setback section of this document, the permitting authority will be the Minnesota Public Utilities Commission, as Steele County is not a delegated county for permitting projects between 5 and 25MW in size.

4.2 Demographics

4.2.1 Description of Resources

The Project is located in southeastern Minnesota in a rural/agricultural region within Steele County. The 2000 census population for Steele County was 33,680, and the estimated 2008 population was 36,239, resulting in an increase of 7.6%. The average household size for Steele County in the year 2000 was 2.57 people, with 13,306 housing units.

The Project is further located in part of Blooming Prairie Township. According to the Steele County Comprehensive Land Use Plan (2007), there are an estimated 488 individuals and 173 households in Blooming Prairie Township. The population density is 13.9 people per square mile, and there are 173 housing units at an average density of 4.9 units per square mile. There are an estimated 68 individuals living within the project area. Of that number, approximately 58 persons live on participating parcels. Census data collected over the past 35 to 40 years suggest that the population of the Township is steadily decreasing. Between the years of 1970 and 2005, the population of Blooming Prairie Township decreased by 157 individuals.

There are two population centers near the Project Area. The unincorporated village of Bixby in Aurora Township, with a population of less than 630, is located 1.1 miles northeast of the Project. The City of Blooming Prairie, with a population of 1,965, is located approximately 3.0 miles southeast of the Project.

According to the 2002 U.S. Economic Census, the largest industries employing residents in Steele County are manufacturing and retail, which employ approximately 62% of the workforce.

Steele County had a median household income of \$46,106 in 1999. Estimated median household income for 2008 was \$54,826. The per capita income for the Project Area Township is lower than the overall county per capita income. In addition, the poverty level within the Project Area Township is above that of the overall county. **Table 4-1** summarizes some of the population and economic characteristics of the county and

township in which the project is located. The 1999 per capita income and poverty level data is the most recent data available at the township level.

Location	Population	Per Capita Income	Population Below Poverty Line (%)
Steele County	33,680	\$20,328	6.2%
Blooming Prairie Township	519	\$18,189	8.6%

4.2.2 Impacts

A number of full time jobs are expected to be added as a result of the Project. This includes temporary jobs for construction of the Project and permanent jobs for operation of the Project once it is built. The communities near the Project are also expected to receive positive economic impacts. Short-term impacts to the socioeconomic resources of the area are expected to be minor. It is anticipated that roughly 5 to 6 acres of land which is currently being used for agriculture will be removed from production for the length of the easement agreements. Landowners will be compensated for this loss. Both landowners within the Project Area who receive a wind turbine on their property, and those who do not, will be compensated for wind rights through easements. Construction is expected to stimulate some local industries and should have no negative impacts to the local industries as a whole. There is no indication that any minority or low-income population is concentrated within the Project Area, or that the wind turbines will be placed in an area occupied by a minority group.

To the extent possible, Oak Glen Wind plans to use local contractors and suppliers for portions of the construction. Wages and salaries paid to contractors and workers in Steele County will contribute to the overall personal income of the region. Additional personal income will be generated for residents in the counties and state by circulation and recirculation of dollars Oak Glen Wind pays for business expenditures and for state and local taxes. Equipment, fuel, operating supplies, and other product and service expenses will benefit businesses in the counties and the state. Landowners having a turbine or other Project facilities on their land will receive payment annually for the life of the Project. Such payments should strengthen the local economy.

Construction and operation of the Project will provide long-term beneficial impacts to the counties' tax bases and it will contribute to improving the local economy in this part of Minnesota. As described in other nearby wind farm site permit applications, the development of wind energy in this area of Minnesota has been important in diversifying,

supporting and strengthening the personal income and property tax base of southeastern Minnesota.³

In addition to creating jobs and personal income, lowering property taxes and improving infrastructure, the Project will pay an energy production tax to the local units of government of 0.12 cents per MWh of electricity produced, resulting in an annual wind energy production tax projected to be approximately \$170,000 to \$180,000. Indirect economic benefits include creation of new jobs in manufacturing, operations and technology.

4.2.3 Mitigation

Effects to regional socioeconomics as a result of the proposed Project will be primarily positive due to an influx in wages and expenditures at local businesses during construction and an increase in the counties' tax bases from the construction and operation of the wind turbines and associated infrastructure. In addition, the easement payments paid to landowners will offset potential financial losses associated with removing land from agricultural production and wind rights. Therefore, because no impacts are anticipated, no mitigative measures are proposed.

4.3 Noise

4.3.1 Description of Resources

In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. The L_5 is defined as the noise level exceeded 5% of the time, or for three minutes in an hour. The L_{50} is the noise level exceeded 50% of the time, or for 30 minutes in an hour. Land use areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories.

Table 4-2 identifies the established daytime and nighttime noise standards by NAC. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within the hour.

³ See Minnesota Public Utilities Commission, Docket Nos. IP6631/WS-07-388 (Site Permit Application for a Large Wind Energy Conversion System for the Elm Creek Wind Project in Jackson and Martin Counties, Minnesota (June 15, 2007); NSP-WGR-1-95 (NSP Phase II). See also *Assessing the Economic Development Impacts of Wind Power* (2003), Northwest Economic Associates, which analyzes the NSP Phase II/Lake Benton I Wind Project in Lincoln County, MN.

Noise Area Classification	Daytime		Nighttime	
	L ₅₀	L ₁₀	L ₅₀	L ₁₀
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Because human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more “weight” in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, which is the A-weighted sound level recorded in units of decibels.

A noise level change of 3 dBA is barely perceptible to human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. **Table 4-3** shows noise levels associated with common, everyday sources.

Sound Pressure Level (dBA)	Noise Source ^a
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

^aSource: Minnesota Pollution Control Agency (1999)

Nighttime noise levels are low to mid-30 dBA within the Project Area, which are typical of those in such rural settings. The dBA scale is A-weighted decibels based on the range of human hearing. Low to mid-30 dBA are relatively low background levels and higher levels may exist near roads, farmsteads and other areas of human activity. Wind conditions in the Project Area tend to increase ambient noise levels compared to other rural areas.

4.3.2 Impacts

Operation and maintenance of the Project wind turbines and associated facilities will create increased noise levels. The sound level varies with the speed of the turbine, the distance of the receptor from the turbine, and surface characteristics of the site. The turbine speed, in turn, depends on the weather conditions. Generally, on more windy days turbines can create more sound. However, increases in noise levels within the Project Area are expected to be minimal due to the noise levels produced by the wind itself, especially at the setback distances required to meet the minimum 500-foot setback from homes and the noise setbacks in the Minnesota Noise Standards under Minnesota Rules Chapter 7030. Turbines will be located at least 500 feet from homes plus the distance necessary to meet Minnesota Noise Standards.

At the Project substation, the source for noise is primarily the transformers, which can create a humming noise. The nearest occupied home to the proposed Project substation is located approximately 1,800 feet away. It would be unlikely that substation noise would be audible at this farmstead/home.

4.3.3 Mitigation

Oak Glen Wind is taking into account in the design, siting and construction of the proposed wind farm Project possible noise impacts to nearby rural residences/farmsteads and other potentially affected parties. The GE 1.5 MW xle and Vestas V90 1.8 MW wind turbines are being considered for the Project. The calculated noise setback is based on the highest noise level of the wind turbines under consideration for the Project.

Oak Glen Wind analyzed the noise footprints of the Project for both the GE 1.5 MW xle and the Vestas V90 1.8 MW wind turbine models using the WindPRO version 2.6.1.252 module Decibel for Noise Impact Calculation. Oak Glen Wind used the sound power level information provided by manufacturers of the GE 1.5 MW xle and the Vestas V90 1.8 MW wind turbines to calculate representative noise levels for the Project using the WindPRO module. According to the manufacturers' noise data, the sound power level of the GE 1.5 MW xle wind turbine at an 80 meter hub height ranges from less than 96 dB (at 3 m/s wind speed) to less than or equal to 104.0 dB (at 8 m/s wind speed to the cut out speed). The sound power level of the Vestas V90 at an 80 meter hub height ranges from less than 94.4 dB (at 4 m/s wind speed) to less than or equal to 104.0 dB (at >8 m/s wind speed). The highest sound power level of 104.0 dB was used in the WindPRO module to calculate the distance to the noise setbacks. The distance to the 50 dBA noise setback is approximately 170 meters (558 feet) for both turbines. As shown in **Exhibits 5a and 5b**, no residences are located within the 50 dBA setback area. This analysis indicates that the preliminary turbine locations meet the state noise standards for both turbine models.

Prior to the start of construction, Oak Glen Wind will complete additional noise modeling using the final turbine locations and maximum sound level outputs of the selected wind

turbine to ensure compliance with state noise standards and that the project meets or exceeds those standards. A modeling program such as WindPRO version 2.6.1.252 (Decibel for Noise Impact Calculation), or other, will be used to model the sound outputs of the project.

In accordance with the standards established in other LWECS site permits issued by the PUC, Oak Glen Wind will use at least a 5 RD setback from the perimeter boundaries of land under easement agreement within the Project Area along the north-south axis (downwind spacing) and a 3 RD setback on the east-west axis (crosswind spacing). A 250-foot setback from all public roads will be employed. Based on the recently issued Minnesota Department of Health white paper *Public Health Impacts of Wind Turbines*, the Minnesota Public Utilities Commission is presently gathering information to evaluate the current setback guidelines.

If the sound characteristics of the selected turbine are different from those discussed in the Application, Oak Glen Wind will address setbacks to ensure compliance with MPCA noise standards.

4.4 Visual Impacts

4.4.1 Description of Resources

The topography of the Project Area is relatively flat to mildly undulating and is interrupted only by a small number of streams which drain the Project Area (**Exhibit 2**). Elevations range from 1,208 to 1,331 feet above mean sea level. The typical visual landscape within the Project Area consists of agricultural fields, farmsteads with trees planted as windbreaks, active or fallow fields, and gravel pits.

The majority of landscape within the Project Area may be classified as agricultural and rural open space. Within the Project Area, local vegetation is predominantly agricultural crops, including mainly corn and soybeans, which visually create a low uniform cover. A mix of deciduous and coniferous trees planted for windbreaks typically surrounds farmsteads, which were established to prevent wind erosion and to shelter dwellings.

Aside from the local vegetation, the main focal points present in the agricultural landscape are the farm residences and buildings. Of the structures present, a portion date back to the 19th and early 20th centuries and are representative of that era of Minnesota farm architecture. In addition, there are several gravel pits located in the Project Area.

There are no existing FAA permitted towers located within the Project Area. Within 10 miles of the Project Area, 9 towers (as of February 2009), potentially including microwave, AM, FM, and other FAA permitted towers have been identified and have slightly altered the landscape from being strictly agricultural. The nearest tower to the

Project Area is a communications tower approximately 1 mile east of the Project Area in section 11 of Blooming Prairie Township along SE 123rd Street. This is also the location of the Met tower for the Project.

To date, southeastern Minnesota has not seen as many wind farms as other parts of the state. A substantial number of wind farms have been built in other areas, while others are in various phases of approval. Of the local area counties, Mower County has seen the most wind development (see **Table 4-4** and **Exhibit 6**).

Counties	January 2009
Steele	0
Rice	2
Dodge	46
Mower	238
Freeborn	0
Waseca	0

According to the American Wind Energy Association (AWEA), as of September 2009, there were 1,421 existing wind turbines in the state. Minnesota currently ranks 4th in the nation for existing wind energy capacity. The presence and visual effect of towers and turbines have existed or will exist in the general vicinity of the Project Area.

In January 2009 the Minnesota Department of Commerce Energy Facility Permitting/Department of Administration's Land Management Information Center prepared a map of Minnesota indicating the locations and numbers of wind turbines in the state. According to this information, a total of 1,331 wind turbines have been installed in Minnesota (1,040 wind turbines permitted by the MPUC and 291 wind turbines permitted by non MPUC authorities).

4.4.2 Impacts

The visual effect of the Project will depend largely upon perceptions of observers. The visual contrast added by wind farms may be perceived as a visual disruption or as points of visual interest with their own aesthetic quality and appeal. Post-construction operation of the wind farm will not generate much traffic or significantly increase day-to-day human activity in the area. The Project Area will therefore retain its rural sense and remote character. The proposed Project would not involve ongoing industrial use of non-renewable resources or emissions into the environment.

Wind farms may appear industrial to some. However, the turbines function to "farm" the wind for energy. While existing wind farms are located in adjacent counties, they are not

located in the immediate vicinity of the Project and therefore should not cumulatively contribute to the visual effect of the existing wind farms. Additionally, the location of the proposed Project relative to the existing wind farms will limit the extent to which the proposed Project is viewed as a disruption to the area's scenic integrity.

The presence of turbines within the viewshed of natural areas may also affect the aesthetic quality of those areas being used by persons. It can be argued that seeing turbines from a natural area may detract from that experience. However, the same is true of other human habitation or commercial structures in the Project Area, and the presence of turbines may be less intrusive than these human activities. There are several Wildlife Management Areas (WMAs) located within or near the Project Area, and although these areas will be avoided, it is possible that the proposed turbines could be visible from these locations.

4.4.3 Mitigation

Oak Glen Wind will work to avoid or minimize, to the extent possible, visual impacts into the final design and siting of the Project. Oak Glen Wind will work with landowners to identify concerns related to Project aesthetics and to address visual impacts. Oak Glen Wind proposes the following mitigative measures:

- Turbines will be uniform in color;
- Turbines will not be located in biologically sensitive areas such as public parks, WMAs, SNAs, WPAs, or wetlands;
- Turbines will be illuminated to meet the minimum FAA requirements for obstruction lighting of wind turbine farms (e.g. reduce number of lights on turbines and synchronized red strobe lights);
- Collector lines will be buried to minimize aboveground structures within the turbine array;
- Existing roads will be used for construction and maintenance where possible to minimize the amount of new roads constructed;
- Access roads created for the wind farm facility will be located on gentle grades to minimize erosion, visible cuts and fills; and
- Temporarily disturbed areas will be converted back to cropland or otherwise reseeded to blend in with existing vegetation.

4.5 Public Services and Infrastructure

4.5.1 Description of Resources

Local Services

The Project is located in a lightly populated, rural/farming area in southeast Minnesota. Public services to farmsteads and rural residences within the Project Area include transportation/roadways, electric and telephone. The closest city to the Project Area is the City of Blooming Prairie (City) located approximately 3.0 miles southeast of the Project Area (**Exhibit 1**). The City provides sanitary sewer, water, electric, natural gas, and phone services to its residents. Additionally, the City's emergency services include a full time police department, volunteer fire department, ambulance, and emergency management service. There are no railroad lines in the Project Area.

Electrical Service

There is currently one utility transmission line within the Project Area. Great River Energy has a 69kV transmission line running across the northern portion of the Project Area as indicated on **Exhibit 7**.

Water Supply and Sanitary Service

Townships within the Project Area have limited public infrastructure services. Homes and farmsteads typically utilize on-site water wells and septic systems for individual household sanitary needs.

Roads

Existing roadway infrastructure in and around the Project Area consists of county and township roads that generally follow section lines, with private unpaved farmstead driveways and farming access roads. Various County State Aid Highways (CSAHs), a County Road (CR), a State Trunk Highway (STH) and a U.S. Highway provide access to the Project Area. The CSAHs, CR, STH and U.S. Highway are two-lane paved roads. The remaining roads within the Project Area are two-lane gravel roads. The topography of the area allows for the creation of a road network providing good access to most locations within the Project Area. This is considered a strength of this particular Project location, which will reduce the need for access roads and allow existing uses, namely agriculture, to continue relatively unaltered (**Exhibits 3a and 3b**).

U.S. Highway 218 is located approximately 1 mile east of the Project Area, and STH 30 is located approximately 1.5 miles south of the Project Area. There are a number of county roads located within the Project Area. CSAH 26 runs across the northern portion of the Project Area, CSAH 24 runs from CSAH 26 south through the middle of the Project Area, and CR 55 runs from CSAH 24 west along the southern portion of the Project Area.

Traffic

The existing traffic volumes on the area's federal, state, and county roads and highways are documented in **Table 4-5** and on **Exhibit 8**. U.S. Highway 218 has the highest Annual Average Daily Traffic (AADT) count at 4,250 vehicles per day. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. For the county road system, the highest existing AADT in the Project Area is 265 vehicles per day for CSAH 24 south of CR 55.

Roadway Segment Description		Existing Annual Average Daily Traffic (AADT)
U.S. Trunk Hwy	U.S. Highway 218 (east of Project Area)	4,250
Minnesota Trunk Hwy	STH 30 (south of Project Area)	1,200
Steele County	CSAH 26	200
	CSAH 24 (north of CR 55)	150
	CSAH 24 (south of CR 55)	265
	CR 55	120

Source: MnDOT 2007 Traffic Volumes General Highway Map Steele County, MN. MnDOT 2007

Telephone, Microwave, and Other Communication Reception

Existing communication towers are discussed in Section 4.4.1. Telephone service is provided by Qwest and other local telephone companies to farmsteads, rural residences and businesses in the area. Oak Glen Wind retained Merjent, Inc. to review existing licenses from the Federal Communications Commission (FCC) Wireless Telecommunications Bureau and analyze the data using the FCC's Universal Licensing System to establish known point-to-point microwave beam paths over a wide frequency range (900 MHz – 23 GHz) that may be adversely impacted as a result of constructing the Project. The review identified 48 individual beam paths that are currently licensed or pending license from the FCC with origination points located within a 15-mile radius of the project area. None of the identified beam paths intersect or are within 2 miles of the Project Area (**Appendix D**).

4.5.2 Impacts

The Project is anticipated to have minimal effect on existing services and infrastructure of the area. Oak Glen Wind will design the Project in accordance with the results of the telecommunication study to minimize impacts to communication infrastructure and other existing infrastructure. The following is a brief description of the impacts that are possible during the construction and operation of the Project.

Local Services

No impacts are expected to local services.

Electrical Service

The connection between the collector substation and Point of Interconnect (POI) will be via an overhead 69kV transmission line running in the existing ROW along CSAH 26. There is an existing 69kV transmission line currently occupying this ROW, and Oak Glen Wind is currently working with the local distribution and transmission owners to accommodate the project interconnection. Impacts to the electrical service may be experienced where coordinated short term outages occur when high clearance construction equipment needs to cross areas with overhead distribution lines.

Water Supply

Construction and operation of the proposed Project will not affect the water supply. No installation or abandonment of water supply wells is anticipated for the Project. However, if water supply wells are installed or abandoned, it will be accomplished in accordance with applicable law and requirements of the Minnesota Department of Health (MDH).

It is not anticipated that the Project will require the appropriation of surface water or permanent dewatering. Temporary dewatering may be required during construction for specific turbine foundations and/or electrical trenches. Water use during construction may occur to provide dust control and water for concrete mixes and other construction purposes.

Roads

Equipment and materials used in the erection of wind farms can be extremely heavy. Possible weight related impacts to roads include physical damage to the structure of the road itself and/or damage to culverts and bridges.

On January 7, 2010 Oak Glen Wind sent letters to the Minnesota Department of Transportation (MnDOT) and Steele County Transportation Department for comments on the Project. On January 13, 2010 Westwood received a response letter from the MnDOT District 6 Acting Planner Director. The letter states the following:

- MnDOT District 6 should review the project again, when the high voltage transmission lines have been delineated.
- Any work within the MnDOT right-of-way for temporary or permanent access will require a District permit. Placement of utilities would require a Utility Long Form Permit issued through St. Paul. The temporary widening of field entrances or a new access would require an Access Driveway Permit issued through District 6.

Oak Glen Wind will work with all parties involved to address concerns related to roadway use, and adhere to state, county, and township requirements for transportation infrastructure.

Temporary and permanent gravel access roads will be constructed for the Project. Temporary roads will be approximately 40 to 45 feet wide to accommodate delivery of the turbines, towers, and related equipment and supplies, and to provide access to cranes required for construction of the wind tower generators. The final length of new roads is dependent on the size of the turbine selected, turbine layout and final design which are still in process. Permanent access roads will also be used during operation of the Project by operation and maintenance crews for gaining access to inspect and service the wind turbines. In general, the access roads will be located between the towers. Permanent roads will be approximately 16 feet wide and low profile to allow cross-travel by farm equipment.

Traffic

Construction traffic will use the existing road system for access to the Project Area. Current traffic levels on the affected roadways in the Project Area are well below roadway capacities and construction traffic will be perceptible but similar to seasonal variations in traffic, such as autumn harvest. Therefore, construction activities are not expected to affect traffic levels. Operation and maintenance activities will also not noticeably increase traffic within the Project Area.

Letters requesting comments on the possible traffic impacts to the local roads have been sent to Steele County and Aurora, Blooming Prairie, Somerset and Summit Townships. Comments received are provided in **Appendix C**.

Telephone, Microwave, and Other Communication Reception

Construction and operation of the proposed wind farm is not intended to impact telephone service to the Project Area. The results of the microwave analysis determined that there are no microwave beam paths intersecting the Project Area. Additionally, on August 12, 2009, Oak Glen Wind Farm, LLC consulted with both the Steele County Administrator and the Minnesota Department of Transportation Electronic Communications Department regarding potential impact of the Project on emergency communications. Both agree that the Project will not interfere with emergency services communication systems in Steele County. There is no documented evidence that turbines impact or interfere with cell phone towers or other communication towers; therefore, no review of nearby cell phone or other communication towers has been completed.

4.5.3 Mitigation

Construction and operation of the Project will be in accordance with associated federal, state, and local permits and laws, as well as industry construction and operation standards. The Project is anticipated to have minor effects on the existing infrastructure

during Project construction and operation. Therefore, extensive mitigation measures are not proposed.

Local Services

Because no impact to local services is anticipated, no mitigation measures are proposed.

Electrical Service

Oak Glen Wind will purchase station service from a local electrical utility. The Mid-Continent Area Power Pool (MAPP) will suggest appropriate configurations for the electrical system, and Oak Glen Wind will abide by the recommendations to prevent impacts to the existing transmission system. Oak Glen Wind is currently working with local distribution and transmission owners to accommodate the project interconnection. No additional mitigation is necessary.

Water Supply

In the event that water supply wells are abandoned or installed, or Environmental Bore Holes are drilled, Oak Glen Wind will do so in accordance with applicable Minnesota law and Minnesota Department of Health (MDH) requirements. If temporary dewatering is required during construction activities, discharge of dewatering fluid will be conducted under the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Pollution Prevention Plan (SWPPP).

Roads

Prior to construction, Oak Glen Wind will coordinate with the applicable local and state entities to ensure that the weights being introduced to area roads are acceptable. Oak Glen Wind will work with the Cities of Blooming Prairie and Ellendale; Aurora, Blooming Prairie, Somerset and Summit Townships; Steele County and MnDOT regarding roadway concerns, right-of-way work (if any), and setbacks during construction of the Project. Oak Glen Wind will also work closely with the landowners in the placement of access roads to minimize land-use disruptions during construction and operation of the Project to the extent possible.

Traffic

Current traffic levels on the affected roadways in the Project Area are well below roadway capacities and construction traffic will be perceptible but similar to seasonal variations in traffic, such as autumn harvest. U.S. Highway 218 will likely be used for delivery of the tower components, turbines and related construction materials. However, the timing of such deliveries will be managed to avoid significant impacts to traffic on U.S. Highway 218.

Oak Glen Wind will work with the Cities of Blooming Prairie and Ellendale; Aurora, Blooming Prairie, Somerset and Summit Townships; Steele County and MnDOT

regarding traffic, access, and permitting oversize loads during construction of the Project. No other mitigation measures are necessary.

Telephone, Microwave, and Other Communication Reception

Prior to construction, a utility locate service will be contacted to locate underground facilities so they can be avoided. To the extent Project facilities cross or otherwise affect existing telephone lines or equipment, Oak Glen Wind will make arrangements with applicable service providers to avoid interference with such facilities. At this time, no impacts are anticipated to microwave or radio facilities, and therefore, no mitigative measures are proposed.

4.6 Cultural and Archaeological Resources

4.6.1 Description of Resources

The proposed Project Area is located on the eastern edge of the Prairie Lakes East Archaeological Region (2e) (Anfinson 1990). The Prairie Lakes East Region is located in south-central Minnesota and includes, Le Sueur, Waseca, Steele, and Freeborn Counties and portions of Blue Earth, Faribault, Rice, Scott, and Dakota Counties. The Prairie Lakes East Archaeological Region encompasses all of the defined Project Area.

Topography of this region is typified by ground moraines and hill moraines. Habitation sites in this region can be located anywhere, both near water and in historically wooded areas away from water. Resource procurement sites may be located anywhere in the region, but are most likely at the edge of water bodies (Anfinson 1990).

In January 2010, Oak Glen Wind conducted a review of records at the Minnesota State Historic Preservation Office (SHPO) and Office of the State Archaeologist (OSA) for the Project Area and a one-mile buffer around the Project Area. The background literature search identified five inventoried historic architectural resources located within one-mile of the proposed Project Area. Only one of the historic architectural resources is located within the defined Project Area. None of the historic architectural resources have been evaluated for eligibility for listing on the National Register of Historic Places (NRHP). A summary of the identified historic architectural resources is provided in the following **Table 4-6** and shown on **Exhibit 9**.

Site Number	Site Name	Twp	Rng	Sec	NRHP Status	Project Area / Buffer
ST-BIE-001	Union Creamery	105	19	17	unevaluated	Buffer
ST-BIE -002	District School No. 93	105	19	16	unevaluated	Buffer

Site Number	Site Name	Twp	Rng	Sec	NRHP Status	Project Area / Buffer
ST-BIE -003	Trinity Lutheran Church	105	19	9	unevaluated	Project Area
ST-SUM-001	Schisler Store/Summit Bar	105	20	1	unevaluated	Buffer
ST-SUM-002	Summit Creamery	105	20	12	unevaluated	Buffer

Key: Site Number = site designation applied by State Historic Preservation Office; Site Name = unofficial site name as listed on inventory form; Twp = Public Land Survey (PLS) Township designation; Rng = PLS Range Designation; Sec = PLS Section Designation; NRHP Status = evaluation status of recorded property in regards to National Register of Historic Places Eligibility; Project Area / Buffer / Moved = denotes if listed site is within the defined project area, within the two-mile buffer, or moved outside study area.

No previous archaeological surveys have occurred within the Project Area or the one-mile buffer. Also, no previously recorded archaeological sites have been identified within the Project Area or the one-mile buffer. The absence of recorded sites is most likely due to the lack of investigation within the Project Area.

4.6.2 Impacts

On January 7, 2010, Westwood, on behalf of Oak Glen Wind, sent the Minnesota SHPO a letter informing them of the Project and requesting comments. As of the publication of this document SHPO has not responded. While Oak Glen Wind will attempt to avoid archeological sites, the proposed construction activities for the Project have the potential to impact such sites or to add to the visual impacts in the region of the Project Area. In the event that an impact would occur, Oak Glen Wind will determine the nature of the impact and consult with the SHPO on whether or not the resource is eligible for listing in the National Register of Historic Places (NRHP).

4.6.3 Mitigation

Oak Glen Wind will attempt to avoid impacts to identified archeological and historic resources to the extent possible. If archaeological or historic resources are found during cultural resource investigations or during construction, the integrity and significance of such resources will be addressed in terms of the site's potential eligibility to the NRHP. Also, an assessment of the Project's potential impacts upon the resource will be undertaken. If such resources are found to be eligible for the NRHP, adverse effects to the resource will be avoided by adjustment of the array when possible. If avoidance is not possible, appropriate mitigative measures will need to be developed in consultation with Minnesota SHPO, the State Archaeologist, and consulting American Indian communities. While avoidance would be a preferred action, mitigation for Project-related impacts on NRHP-eligible archaeological and historic resources may include additional documentation through data recovery.

Should previously unknown archaeological resources or human remains be inadvertently encountered during Project construction and/or operation, the discoveries will be reported to the SHPO. With regard to a discovery of human remains, procedures would be followed to ensure that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.

4.7 Recreational Resources

4.7.1 Description of Resources

Information from the U.S. Fish & Wildlife Service (USFWS), Minnesota Department of Natural Resources (DNR), and Steele County were reviewed to identify recreational resources within and near the Project Area. Significant recreational resources identified within this portion of Steele County include multiple Wildlife Management Areas (WMAs) and Wildlife Production Areas (WPAs), recreational lakes and trails, and a game refuge (**Exhibit 10**). Recreational opportunities in Steele County include boating, fishing, snowmobiling, hunting, bird and wildlife viewing, camping, and hiking. There are no federal, state, county, or city parks in or near the project boundary. In addition, no DNR Scientific & Natural Areas were identified within close proximity to the project boundary.

The main branch of the Straight River is located approximately 3 to 4 miles west of the project boundary, and is a designated DNR water trail for canoeing and kayaking. Tributaries to the Straight River originate from Oak Glen Lake and Rickert Lake and flow south/southwest through the site in several locations. The Straight River and its tributaries provide fishing opportunities for northern pike, crappies, and smallmouth bass. According to DNR Public Waters mapping, the two waterways furthest east within the project area are designated DNR Public Watercourses.

Wildlife Management Areas (WMAs) are part of Minnesota's outdoor recreation system and represent a large portion of the Minnesota DNR's wildlife management efforts in the state. The areas were established to protect certain lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses. These areas are integral to protecting wildlife habitat for future generations, providing citizens with opportunities for hunting, fishing and wildlife watching, and promoting important wildlife-based tourism in the state (MnDNR 2009).

Four WMAs were identified within approximately two miles of the project boundary. Two WMAs are located within approximately ½-mile of the project boundary and one is located slightly within the project boundary (<500'). An additional WMA is located approximately two miles north of the project site. **Table 4-7** identifies each WMA, its general location, and distance from the site boundary.

Resource Name	General Location	Distance from Project
Aurora WMA	Northwest of Oak Glen Lake	Approximately two miles north of northern project boundary
Myron Buelow WMA	Southeastern project area surrounding Rickert Lake	Roughly 6.7 acres of this WMA exists within the project boundary (southwestern quarter of Section 10)
Oak Glen WMA	West of Oak Glen Lake (Main Bay)	½ to ¾-mile north of northeastern project boundary
Pogones Marsh WMA	Western Blooming Prairie Township	½-mile from southwestern project boundary

Waterfowl Production Areas (WPAs) are public, National Wildlife Refuge lands managed by the U.S. Fish and Wildlife Service for the purpose of preserving wetlands and grasslands critical to waterfowl and other wildlife. While no WPAs were identified within the project boundary, the Straight Creek WPA was identified adjoining the southwestern boundary of the project area. The Straight Creek WPA is located immediately west of the Pogones Marsh WMA.

There are a few natural lakes within proximity to the Project including Oak Glen Lake, Rickert Lake, and a few unnamed lakes south and west of the project boundary. These lakes offer recreational opportunities including fishing and boating. There are no lakes located within the project boundary.

The 711-acre Rickert Lake State Game Refuge (SGR) is located partially within the far eastern border of the project boundary on less than ½ of a section (**Exhibit 10**). According to Janine Vorland, MnDNR, the SGR is privately owned land that is managed for hunting by the state. The Myron Buelow WMA is located in the southern half of the SGR, and is also considered a Waterfowl Sanctuary. While the SGR is open to Canada goose hunting during the early September goose season, the Waterfowl Sanctuary portion of the SGR is closed to both hunting and trespass. Other than hunting, there are no other restrictions on land use within the State Game Refuge. Two private parcels exist within the SGR according to existing landowners, and both parcels are actively farmed. There are no easements in place in relation to the State Game Refuge.

The Blooming Prairie Country Club, located south of Oak Glen Lake and east of Highway 218, features a regulation length 9-hole golf course and driving range.

According to the Minnesota Department of Natural Resources Recreational Compass mapping, there are no state trails, state forests, national forests, or national wildlife refuges within close proximity to the project area.

4.7.2 Impacts

The Project will be designed in a way that will avoid direct impacts to recreational resources within the Project Area to the degree possible. Recreational resources within the project area include the Rickert Lake State Game Refuge, DNR public watercourses and waterways, and a very small portion of the Myron Buelow WMA and Waterfowl Sanctuary. All other identified recreational resources are located outside of the existing project boundary where physical land disturbance is not planned. Impacts to recreational resources will be primarily visual in nature, and will affect individuals utilizing public open spaces within approximately 4 miles of the project vicinity. More details regarding visual impacts are provided in previous portions of this report. No impacts to tourism and community benefits are anticipated.

4.7.3 Mitigation

Encroachments by the Project into publicly owned lands is not planned or expected; therefore, mitigation measures are not proposed at this time.

4.8 Human Health and Safety

4.8.1 Description of Resources

Air Traffic

There are five registered airports and one heliport located within approximately 20 miles of the Project Area. A review of the AirNav, LLC (AirNav 2010) database revealed the nearest registered airports within 20 miles, which are provided in **Table 4-8**. Distances are from the approximate center of the project area.

Airport ID	Airport Location	Airport Name	Approximate Distance from Project Center
MN61	Hollandale, MN	Ward Airport	10.9 mi SSW
OWA	Owatonna, MN	Owatonna Degner Regional Airport	15.9 mi NNW
TOB	Dodge Center, MN	Dodge Center Airport	16.3 mi ENE
6MN8	Medford, MN	Underland Airstrip Airport	18.0 mi NNW
MN34*	Austin, MN	St. Olaf Hospital Heliport	18.1 mi SSE
AUM	Austin, MN	Austin Municipal Airport	19.8 mi SSE

* Heliport.

In addition to the registered airports, there are two unregistered private landing strips located in the vicinity of the project. One landing strip is located approximately 2 miles

southeast of the project boundary and west of Blooming Prairie (Selstad Landing Field); the second is located 2.5 miles east of the project boundary, east of Rickert Lake and U.S. Highway 218. Four other private landing strips are located in a triangular area east of the project between the Cities of Blooming Prairie, Hayfield, and Dodge Center.

Electromagnetic Fields

Possible health effects associated with wind turbines and transmission of electricity generally include Electric and Magnetic fields (EMF) and noise.

Electric and Magnetic Fields (EMF) are the electric and magnetic fields that are coupled together, such as in high frequency radiating fields. The term EMF refers to electric and magnetic fields that are present around electrical devices. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection (feeder) lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (transmission line wire). Once energized, the proposed facility will generate electromagnetic fields.

Security

Steele County and local municipalities maintain procedures and infrastructure to aid in protecting the public and mitigating damage in the event of an emergency. Steele County has its own Emergency Management Office (EMO). According to the County's web page, the EMO coordinates the development and updating of the Emergency Operations Plan (EOP) that addresses all types of hazards that may affect the citizens and visitors of Steele County, and is routinely involved in the following types of activities:

- Conducting and evaluating exercises on various types of disasters
- Attending meetings with government, private business, and support service officials to promote preparedness plans
- Maintaining routing communications with State and Federal Emergency Management agencies
- Educating the public on disaster preparedness, and
- Meeting all State and Federal requirements related to EOP development, program funding, and staff training.

The proposed wind farm Project Area is located in an area that has a relatively low population density. According to the Steele County Comprehensive Land Use Plan (2007), there are an estimated 488 individuals and 173 households in Blooming Prairie Township. The population density is 13.9 people per square mile, and there are 173 housing units at an average density of 4.9 per square mile. Census data collected over the past 35 to 40 years suggest that the population of the area is steadily decreasing. Between the years of 1970 and 2005, the population of Blooming Prairie Township decreased by 157 individuals.

Given that the population within the project area is on a steady decline, and low in overall density, it is not anticipated that construction and operation of the Project will have any meaningful impacts on the security and safety of the local population.

Traffic

The existing Annual Average Daily Traffic (AADT) levels for roadways in the vicinity of the Project Area are discussed in Section 4.5 and summarized in **Exhibit 8**. The additional traffic anticipated by the construction and operation of the Project is not expected to reach levels that would create problems for the regional roadway system.

4.8.2 Impacts

Air Traffic

The Project may impact air traffic and safety due to construction of the wind turbines and associated facilities; however, the Project is not expected to create significant impacts on air traffic in the region. There are no registered airports located within the project boundary, and all registered airports and heliports are at least 10 miles away from the project boundary, with most registered airports being at least 15 miles away. While impacts are not anticipated, the applicant will coordinate with these listed airports to ensure that the proposed facility will not cause disruptions of use or dangerous operating conditions.

As previously mentioned, there is a small, unregistered airfield located approximately 2 miles southeast of the project boundary and directly west of Blooming Prairie. Based on reviewed aerial photography, this appears to simply be an agricultural field where small planes occasionally land. There is no defined runway or landing strip. The Applicant will coordinate with this independent owner to ensure that turbines are not placed in locations that would be a detriment or danger to the continued use of the landing strip for small aircraft.

The installation of wind turbine towers in active croplands and installation of overhead collection lines, if needed, increase the potential for collisions with crop-dusting aircraft. However, overhead collection lines are expected to be minimal and similar to existing distribution lines (located along the edges of fields and roadways). The turbines would be visible from a distance and lighted according to FAA requirements. A permanent meteorological tower, if incorporated into the project, will be free standing and have FAA mandated lighting consistent with the turbines. Crop-dusting operations are generally conducted during daylight hours and usually by local pilots with knowledge of the area. This coupled with the visible nature of the towers is expected to result in no impact to local air traffic.

Oak Glen Wind contacted the Minnesota Airports District office of the FAA on January 7, 2010 for comments on the proposed Project. A response letter from the FAA had not been received at the time of filing this report. However, the FAA generally recommends

that the applicant consider adding identified airports to the project distribution list to allow them opportunity to provide comment on the proposed wind facility. The Applicant will contact these airports and work closely with them to ensure opportunity for comment and that no impacts occur to their airspace as a result of this project.

Electromagnetic Fields

Extensive research by the National Institute of Environmental Health Sciences (NIEHS 1999) has determined that extra low frequency EMF exposures pose any health risks to humans is weak.⁴ In 2002 NIEHS prepared a booklet that summarized worldwide EMF health research studies conducted after 1999 (NIEHS 2002). The NIEHS determined that since 1995, the two major U.S. reports concerning the impact of EMF exposure on human health both concluded that “limited evidence exists for an association between EMF exposure and increased leukemia risk, but when all the scientific evidence is considered, the link between EMF exposure and cancer is weak.” Id.

The Minnesota EQB addressed the matter of EMF with respect to new transmission lines in a number of separate dockets from 2003 to 2005. See Docket Nos. 03-64-TR-XCEL (161 kV Lakefield Junction to Fox Lake Substation line); 03-73-TR XCEL (345 kV Split Rock Substation to Lakefield Junction Substation line); 04-84-TR-XCEL (115 kV Buffalo Ridge Substation to White Substation line) and 04-81-TR-Air Lake-Empire (115 kV line in Dakota County). In June 2005, in Docket No. 03-73-TR-XCEL for the 345 kV line connecting the Split Rock and Lakefield Junction substations, the EQB made the following finding with regard to EMF:

118. No significant impacts on human health and safety are anticipated from the Project. There is at present insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects. The EQB has not established limits on magnetic field exposure and there are no Federal or Minnesota health-based exposure standards for magnetic fields. There is uncertainty, however, concerning long term health impacts and the Minnesota Department of Health and the EQB all recommend a "prudent avoidance" policy in which exposure is minimized.

While there is no conclusive research evidence that EMFs pose a significant health impact from power lines and wind turbines, the turbines will be installed above allowable distances from occupied residences, where EMF is expected to be at background levels. Based on the most current research on EMFs, and the distance between any turbines or collector lines and occupied homes, the proposed Project is not anticipated to have significant impact to public health and safety due to EMFs.

⁴ See Electric and Magnetic Fields Research and Public Information Dissemination (EMF RAPID) Program.

Security

Wind turbines constructed as part of the Project will be registered with the Steele County Emergency Management Office and Oak Glen Wind will work with the County EMO to develop appropriate disaster response procedures. The Project Area is also located in a lightly populated rural/farming area. Project construction and operation is expected to have little impact on the security and safety of local residents. As with any large construction project, some risk of worker or public injury exists during construction. However, Oak Glen Wind and its construction representatives and workers will prepare and implement work plans and specifications in accordance with applicable worker safety requirements during construction of the Project. Oak Glen Wind will also control public access to the Project during construction and operation.

Traffic

While the Project is located in an area of relatively low population density, increased road traffic is expected in the short term during construction of the Project. An increase in traffic will also create the possibility of an increased chance of traffic accidents in the local area. Additionally, increased wear and tear of local roads is expected from delivery of Project materials and equipment which has the potential of creating hazardous conditions for traffic.

The maximum construction traffic is expected to be approximately 80 to 100 additional vehicle trips per day, and the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. The existing traffic volumes on the area's county roads and highways are documented in **Table 4-5** in Section 4.5 and on **Exhibit 8**.

In general, the Annual Average Daily Traffic (AADT) counts for roads running through the project area are quite low and range from roughly 120 to 200 vehicles per day. County State Aid Highway 26 has an AADT of 200, County State Aid Highway 24 has an AADT of 150, and County Road 55 has an AADT of 120 vehicles per day. Because many of the area roadways have AADTs currently well below capacity, the addition of 80 to 100 vehicle trips would be perceptible, but similar to seasonal traffic increases such as observed during autumn crop harvest. Use of surrounding roadways for construction of the Project Area will be managed to avoid significant impacts to existing traffic and appropriate traffic control measures will be implemented at all times. Once the Project is completed, maintenance crews will periodically drive through the Project Area to monitor and maintain the wind turbines. Turbines and substations will occasionally require repair, which will create a temporary slight increase in area traffic.

4.8.3 Mitigation

Air Traffic

Oak Glen Wind will work with and coordinate siting the wind turbines with the FAA. The wind turbines and permanent meteorological tower, if incorporated into the project, will be equipped with lighting in compliance with FAA requirements. Permanent

meteorological towers are typically hub height (80m) and are free standing (no guy wires), have galvanized steel tower construction, and medium dual-intensity day and night lights.

Oak Glen Wind will notify local airports, aerial applicators, and hospitals regarding the new tower and turbines to reduce the risk to crop dusters, emergency helicopters, and other local aircraft.

Electromagnetic Fields

Although there is no conclusive evidence of harmful effects of EMFs, increasing the distance between source and receptors decreases the strength of EMFs. Therefore, the planned distances between occupied residences and proposed facilities should mitigate possible harmful effects of EMFs and, therefore, no impacts due to EMFs are anticipated. Consequently, no mitigative measures are proposed. Oak Glen Wind will continue to follow developments concerning EMF and will respond to new information regarding EMFs as applicable to the Project.

Security

Oak Glen Wind will coordinate with the Steele County Emergency Management Office (EMO) for the purpose of saving lives and protecting property related to the Project during natural, manmade or other incidents. Oak Glen Wind will provide required information and work with the County to develop procedures for response to emergencies, natural hazards, hazardous materials incidents, manmade problems (e.g. fire, etc.) and related incidents concerning the Project. Oak Glen Wind will also work with the County Planning Office for assignment of 911 addresses for coordination of emergency response.

While no impact to the security of local residents is expected as a result of construction or operation of the Project, Oak Glen Wind will use the following security measures to reduce the possibility of property damage or personal injury at the Project Area:

- The Project wind turbine locations will be registered with Steele County's Emergency Management and Planning Offices to develop appropriate procedures for emergency responses related to the Project;
- Towers will follow PUC setback requirements;
- Contractors will use proper construction and maintenance methods to ensure minimal impacts to workers and public health and safety;
- Oak Glen Wind and its contractors will provide temporary and permanent safety fencing, warning signs, and locks on equipment and wind power facilities during construction and operation of the Project;
- Oak Glen Wind will conduct regular operation and maintenance and inspections during the life of the Project to address potential blade failures, minimizing the

potential for blade throw. If problems are identified, Oak Glen Wind will perform immediate repairs;

- Turbines will be situated on solid steel enclosed towers where electrical equipment will be located, except for the pad-mounted transformer. Access to the tower will only be allowed through a solid steel door that will be locked when not in use. External electrical equipment will be clearly marked with appropriate warning signs;
- One permanent, free standing meteorological tower may be included in the Project, and will feature medium dual-intensity day and night lights for FAA compliance; and
- Where necessary, Oak Glen Wind will construct gates or fences around the facilities.

Traffic

Because of the rural location of the Project and the relatively low volumes of traffic on adjacent roadways, significant impacts to area traffic are not anticipated. Consequently, no mitigation is proposed. However, Oak Glen Wind will notify Township and County road officials of the construction schedule and will repair road damage occurring during construction of the Project in accordance with permits or other conditions for use. Specific additional truck routes will be dictated by the location required for delivery. Additional operating permits will be obtained for oversized truck movements and potential access permits to the site from State and County roadways, as necessary.

4.9 Hazardous Materials

4.9.1 Description of Resources

Potential hazardous materials within the Project Area would be associated with agricultural use of the land, which includes use of petroleum products (diesel fuel, gasoline, natural gas, heating oil, lubricants, and maintenance chemicals), pesticides and herbicides. Older farmsteads may also contain lead-base paint, asbestos-containing building materials (e.g. shingles and siding), and polychlorinated biphenyls (PCBs) in electrical transformers. Unmarked farmstead waste dumps which may contain various types of wastes are also commonly found in rural/farming areas.

The Minnesota Pollution Control Agency “What's In My Neighborhood?” database (MPCA 2010) of known and potential sources of soil and ground water contamination was consulted for the Project Area. The database revealed seven feedlots and two mapped sites within the project boundary. The nearest mapped sites are listed in the following table.

Table 4-9: What's In My Neighborhood Sites		
Site Name	Type/Activity	General Location
Steele County Landfill (Phase 4)	Construction Stormwater Permit (06/24/2003)	Within site boundary. Half mile northwest of Rickert Lake: 9420 64th Ave SE.
Ed's Backhoe Service LLC/ EJ Rocks Pit	Industrial Stormwater Permit (04/08/2004)	SE corner of 118th Street and 44th Avenue
Wondra Pit (Active)	NPDES/SDS permit (01/18/2007)	County Road 24 near SW project boundary (0.1 miles south of project boundary)
Blooming Prairie Township Dump (Inactive)	Unpermitted Dump Site	0.3 miles south of project boundary
El Lindquist & Sons Inc. (Inactive)	Facility creates some quantity of hazardous waste, but smaller than a Large Quantity Generator	402 Industrial Dr.; Approximately 1 mile southeast of project boundary
National Coatings Restoration Inc. (Active)	Automotive Body, Paint, and Interior Repair and Maintenance	10261 Highway 30 E; Approximately 1 mile southeast of project boundary
Blooming Prairie Auto Body (Active)	Facility creates some quantity of hazardous waste, but smaller than a Large Quantity Generator	0.5 miles north of NE project boundary
Tandem Products Inc. (Active)	Synthetic Rubber Manufacturing; Custom Compounding of Purchased Resins	520 Industrial Dr; 0.5 miles north of NE project boundary
Arkema Inc. (Active)	All Other Basic Organic Chemical Manufacturing	157 Highway Ave N; 0.5 miles north of NE project boundary
Dr. John M. Flor (Inactive)	Offices and clinics of dentistry; Small Quantity Generator	0.5 miles north of NE project boundary

During construction, vehicles and equipment will use gasoline, diesel and other petroleum products. In operation, the Project is not expected to generate significant amounts of hazardous waste or materials. The wind turbines will use synthetic gear box oil, hydraulic fluid, and gear grease. Materials used for operating the wind farm will be maintained by the assigned operations and maintenance contractor and brought to the Project Area as needed.

4.9.2 Impacts

Possible impacts associated with the introduction of hazardous materials into the environment might occur during routine turbine maintenance activities. Minimal amounts of hydraulic oil, lube oil, grease and, possibly, cleaning solvents will likely be

used on the site to maintain the wind turbines. If not properly managed, these materials have the capacity to leach into the soils and potentially contaminate the local aquifer and possibly surrounding surface waters.

4.9.3 Mitigation

Oak Glen Wind has prepared a turbine layout that avoids farmsteads and other buildings by at least 500 feet, thereby avoiding potential encounters with hazardous materials and unmarked waste dumps. Consequently, impacts associated with hazardous materials are not anticipated.

Hydraulic oils and lubricants used within the wind turbines will be contained within the turbine nacelle, or brought to the Project Area as needed. Potential hazardous materials will be properly managed, stored and used in compliance with local, state and federal guidelines for their use by trained technicians. Oak Glen Wind will ensure that wastes generated by the Project are properly disposed of using certified waste handlers.

Fuels and lubricants for vehicles and maintenance equipment will not be stored at the site. Transformer oil will be contained within the electric transformers, and fluid levels will be monitored during scheduled maintenance at each turbine and transformer location. Small amounts of hydraulic oil, lube oil, grease, and cleaning solvents may be used on site and either stored in a nacelle, or brought to the Project Area as needed by the operations and maintenance contractor. When fluids and lubricants are replaced, the waste products will be handled and disposed of according to local, state and federal regulations through an approved waste firm by trained technicians.

4.10 Effects on Land-Based Economics

4.10.1 Description of Resources

Agriculture

Land use within the Project Area is primarily agricultural as shown in the Land Cover Map (**Exhibit 11**). In 2007, over 90% of the land in Steele County (roughly 266,199 acres) was used for agriculture by approximately 934 farms (USDA, 2007 Census Report). Major crops grown in Steele County include: corn, soybeans, vegetables, hay, and sweet corn. Predominant livestock raised in the counties includes turkeys, hogs and pigs, and cattle and calves. Steele County ranks in the top 31 counties in the state for production of corn for grain, 11th for turkeys, 9th for vegetables, and 6th for sweet corn. Drain tiles and storm water management structures related to farming operations are located within the Project Area.

As shown on **Exhibit 12**, 43.6% of the farmland within the Project Area is considered prime, 25.3% is prime farmland when drained and 14.7% is considered farmland of

statewide importance. Approximately 16.5% of the project area is neither non-prime farmland nor farmland of statewide importance.

The Steele County SWCD along with the Natural Resource Conservation Service (NRCS) offer conservation programs that encourage setting aside wetlands and grasslands for conservation purposes, or implementation of conservation practices on private land. These programs can provide another source of income for local farms and landowners. Some of these programs include the Conservation Reserve Program (CRP), Reinvest in Minnesota (RIM), Wetland Reserve Program (WRP), and the Environmental Quality Incentive Program (EQIP). These programs vary in their requirements, payments, and the length of time for which a piece of property must be enrolled. Some of these easements are perpetual in nature. As shown on **Exhibit 10**, there are approximately 9 separate areas within the project boundary that have been set aside under various conservation programs.

Large-scale animal production has been a growing component of the agricultural industry in recent years, and feedlots used for the confined feeding, breeding or holding of animals are a common practice for animal production. The MPCA is the state agency charged with regulating animal feedlots in Minnesota. However, Steele County administers the MPCA's feedlot program through their Livestock Operation Ordinance, which adopts Minnesota Rules Chapter 7020 by reference. There are currently 417 registered feedlots in Steele County (MPCA 2009). Approximately 7 feedlots exist within the project boundary according to the MPCA's "What's In My Neighborhood" map search tool (February 2010).

Forestry

There are no significant forestry resources within the Project Area. Minnesota Land Cover Classification mapping (**Exhibit 11**) indicates that approximately 1.3% of the Project Area is forested. According to Steele County Land Use and Cover mapping developed by the Land Management Information Center (LMIC) for the period between 1988 and 1990, deciduous woodland makes up only 4.7% of land cover within the county. Because of Steele County's agricultural history, much of the original woodlands were removed to make way for agricultural production within fertile soils. Most of the remaining forested areas in the County are association with farmsteads, which typically contain woodlots and shelterbelts. Therefore, Steele County does not currently represent an economically important source for forestry products.

Mining

There are no significant mining resources within the Project Area. However, crushed rock, sand, and gravel are extracted from mines around the county primarily for the purpose of building roads. Based on a review of aggregate resource mapping from a number of available sources, there are approximately seven gravel pits located within the Project Area (**Exhibit 13**). Most of these gravel pits are located within the western half of the project area and within Section 8. Two others are located within the eastern half of the Project Area.

4.10.2 Impacts

Agriculture

The Project will permanently impact some cropland and pasture land for construction of structures, access roads, and associated infrastructure. Construction activities associated with the Project (e.g. grading, soil compaction, access roads, turnaround areas, temporary construction staging areas, etc.) will also temporarily impact agricultural land. Specific temporary and permanent impacts to agricultural lands will be determined once turbine, road and the Project Substation locations have been finalized. Agricultural drain tiles may also be impacted by construction activities.

Overall, impacts to agriculture as a result of the Project are anticipated to be short term, minimal and are not anticipated to significantly alter crop production. Once in operation, it may occasionally be necessary for Oak Glen Wind to complete repairs, or clear vegetation around a turbine or facility, which could result in additional temporary impacts to agricultural operations. These interruptions are anticipated to be infrequent and short term and landowners will be compensated accordingly.

Some livestock operations and pasture land may be temporarily disrupted during the installation of the wind turbines and associated infrastructure. Oak Glen Wind will keep landowners informed about work being completed on their property, and contractors will ensure fenced pasture land remains secure. Aside from the specific areas where wind turbines, roads, and infrastructure are physically located, the remaining portions of the property will be available for grazing and use by livestock. The Project will have little, if any, long-term effects on the ability of the land to be productive for raising livestock.

Forestry

No significant impacts to forestry resources are anticipated. Forested areas near farmsteads and waterbodies will be, for the most part, avoided by the proposed Project. While significant tree removal is not anticipated, some trees and limbs may occasionally need to be removed to install access roads, or trimmed to prevent damage to electrical lines from wind and ice, and to ensure reliable operation.

Mining

No impacts to mining resources or operations are anticipated; however, some of the identified aggregate resources may be used for access road construction. The Applicant will coordinate with the appropriate landowners prior to utilizing materials from these aggregate resource locations.

4.10.3 Mitigation

Agriculture

To the extent possible, Oak Glen Wind will design the Project and locate wind turbines, access roads and associated facilities to avoid or minimize temporary and permanent impacts to farmland. Turbine and facility siting will include discussions with landowners to identify features on their property, including drain tiles and other encumbrances that should be avoided.

The only land that will be taken permanently out of crop production will be those areas encumbered by turbines, access roads, and supporting infrastructure. Additional farmland may be temporarily impacted for use during construction as staging and access areas. Soil compaction will occur, and is considered a temporary impact. However, the construction equipment used in the erection of wind turbines, much like agricultural equipment, is designed with wide tires and tracks to distribute their weight over a larger area. This minimizes the degree of soil compaction resulting from construction. Once construction is complete, Oak Glen Wind will assess disturbed areas and determine whether excessive soil compaction has occurred (in conjunction with the affected landowners). In areas where excessive soil compaction has occurred from project activities, Oak Glen Wind will work with the landowner and negotiate appropriate corrective action measures (e.g. tilling, chiseling, or other methods).

To the extent practicable, staging areas will be placed in previously disturbed locations to minimize the impact to agricultural production. While significant impacts to drain tiles and other existing facilities due to Project construction and operation are not anticipated, Oak Glen Wind will promptly repair or replace drain tile that may be impacted by the Project. Prior to beginning site work, Oak Glen Wind will contact the landowner where the work will be conducted to properly identify and locate drain tiles or other drainage structures that may be present in the work area. Oak Glen Wind will design and construct access roads, buried utilities, overhead utilities and other ground disturbing activities to avoid existing drain tiles to the extent possible.

Impacts on agricultural crops, livestock, native vegetation, and landscaped areas are anticipated to be minimal. Landowners will be reimbursed for potential damage incurred to crops, livestock, and property in a manner consistent with the terms of the easement agreement. Once the Project is completed, Oak Glen Wind will restore vegetation within disturbed areas as close as practicable to its original condition. Post construction restoration will largely depend upon the amount of disturbance occurring on the site and the soil types at each location. Sites used for temporary storage, material staging, and access areas typically experience significant amounts of traffic which will likely require tilling or chisel plowing prior to seeding to loosen compacted soils.

Oak Glen Wind plans to avoid impacts to RIM land, and will minimize impacts to Conservation Reserve Program land to the extent possible. There is currently 180 acres

of CRP land that exists within the project area. If CRP land is impacted, Oak Glen Wind will work with the USDA NRCS, as well as the landowner to remove the impacted portion of the parcel from the CRP program.

If a project is affecting agricultural lands, and federal monies are involved, it is generally a requirement that a Farmland Policy Protection Act (FPPA) site assessment be appropriately filed. If the project will impact agricultural lands, a Farmland Conversion Impact Rating form is generally required (Form AD-1006). FPPA land evaluations are typically conducted by local NRCS personnel who review the project for possible effects on unique, prime or statewide important farmland. Oak Glen Wind will coordinate with the USDA to determine if the FPPA applies to this project, and submit the appropriate documentation, as necessary.

Forestry

No impacts to forestry resources are anticipated and consequently no mitigative measures are proposed. However, Oak Glen Wind will coordinate with affected landowners for replacement of trees lost on private property as a result of the Project.

Mining

No impacts to mining resources are anticipated and no mitigative measures are proposed.

4.11 Tourism and Community Benefits

4.11.1 Description of Resources

Steele County has multiple recreational opportunities available. Tourism is an important part of the Steele County economy and the economies of local municipalities such as the Cities of Blooming Prairie and Ellendale. Important tourism resources in the county include Rice Lake State Park and Rice Lake, the Straight River, Crane Creek County Park, Beaver Lake County Park, and Oak Glen Lake. Steele County is also home to numerous Waterfowl Production Areas and Wildlife Management Areas, which provide a significant tourism draw for anglers and hunters. Local town festivals and fairs are other important tourism draws. The City of Blooming Prairie is the closest city to the Project Area and hosts a number of annual events including, but not limited to, a city-wide garage sale, the Gopher 50 Race, Crazy Days, Holiday Dazzle, and an old fashioned 4th of July celebration. Every year, 35,000 visitors travel to Blooming Prairie for their 4th of July celebration. The Steele County Fair also draws visitors from across the state, and is currently the largest county fair in Minnesota.

4.11.2 Impacts

No negative impacts to tourism and community benefits are anticipated.

4.11.3 Mitigation

No negative impacts to tourism and community benefits are anticipated and no mitigative measures are proposed. The potential increase in traffic volumes on local roadways generated from visitors to the Project Area is not anticipated to rise to a level that would necessitate mitigative actions.

4.12 Topography

4.12.1 Description of Resources

Elevations in the Project Area range from 1,331 feet above mean sea level (amsl) in the southwestern portion of the site to 1,208 feet amsl in the west-central portion of the site (Section 8). An elevation map of the Project Area is provided on **Exhibit 14**. According to the Soil Survey of Steele County, topography within the Project Area was defined by the Wisconsin glacial period and the Des Moines lobe which deposited glacial material in two moraines.

The two large moraine systems were left behind by the Wisconsin ice sheet and run in a north-south direction through the county, divided by the Straight River. The project is situated on or near the eastern moraine system, east of the Straight River, and is characterized by irregular hills and basins and a few scattered, flat-topped sandy kames. The topography of Steele County can be generally described as nearly level or gently undulating with smaller areas of hilly and steep topography near streams and drainageways. The Straight River constitutes the largest watershed in the County. The Straight River passes through the Project Area and flows to the north where it eventually empties into the Cannon River and ultimately the Mississippi.

4.12.2 Impacts

Siting and construction of the turbines, associated facilities, access roads and collection/transmission lines will require grading. The site has very good access from existing public roadways across the Project Area, which will make it possible for Oak Glen Wind to minimize the overall length of access roads. Reduction in access road length will also reduce the amount of grading required to construct the project. Significant impacts to existing topography are not anticipated because steep slopes (greater than 10%) only comprise about 88 acres of the entire project area. Grading within steep slope areas will be avoided to the degree practicable. Minimizing cut and fill requirements will reduce erosion control potential as well as decrease overall construction costs. Layout and siting of access roads will be completed in such a way as to tie into existing public roads, where possible, to reduce unnecessary grading.

4.12.3 Mitigation

As shown on the preliminary layout maps (**Exhibits 3a and 3b**), Oak Glen Wind is considering the location of the proposed turbines in relation to steep slopes and other topographic features. Areas of steep slopes are being avoided to the degree possible. Care will also be taken when siting the locations of collection/feeder lines, transmission lines and access roads to minimize grading activities within and near steep terrain. Best management practices will be used surrounding graded areas in accordance with state standards (e.g. silt fence and/or bio-rolls) to prevent erosion into regional waterways and wetlands.

4.13 Soils

4.13.1 Description of Resources

The majority of the Project Area is mapped in the Estherville-Dakota-Bixby-Biscay associations (**Exhibit 13**). According to the Soils Survey of Steele County, this association consists dominantly of nearly level soils that are intermingled with soils in swales and depressions. They are poorly drained to somewhat excessively drained, loamy soils. These soils tend to be gently undulating with the exception of areas near streams and drainageways. Management needs include providing adequate drainage where needed, irrigation of planted vegetation, proper fertilization, and protection of exposed soils from potential wind erosion. The mapped soil units within the Project Area are summarized in **Appendix E**.

4.13.2 Impacts

Construction of the wind turbines, associated facilities, access roads and collection/transmission lines will require grading. Approximately 84% of the Project Area qualifies as prime farmland or farmland of statewide importance. Soils excluded from these classifications are generally highly erodible soils on steep slopes or are hydric soils associated with streams or wetlands. Consequently, 25 of the proposed 29 turbines are proposed within prime farmland categories.

As part of turbine micrositing, turbines locations may be shifted if preliminarily sited on slopes that are unsuitable for construction. Geotechnical investigations will also be completed at each individual turbine location to confirm suitability for turbine foundation construction. If locations are found unsuitable, adjustments will be made to the turbine positions. Because the design of the Project is in preliminary stages, the precise amount of land to be disturbed cannot be accurately quantified. However, it is anticipated that a very small percentage of soils within the Project Area will be affected.

4.13.3 Mitigation

According to the Steele County Local Water Management Plan 2007 - 2016, soil erosion and sedimentation are the greatest non-point sources of surface water pollution in the county that affect both water quality in lakes, streams, and ditches. The potential for construction-related soil erosion will be minimized by siting turbines and access roads so as to avoid highly erodible soils on steep slopes to the degree possible. Avoiding steep topography will also reduce the size of cut and fill areas. Oak Glen Wind will work with landowners in the Project Area to site turbines and access roads so as to minimize impacts to high quality farmland to the extent practicable.

Oak Glen Wind will obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Minnesota Pollution Control Agency (MPCA) to discharge storm water from construction activities. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and submitted to the MPCA at the time the NPDES permit application is submitted. Appropriate Best Management Practices (BMPs) will be used during construction and operation of the project to protect topsoil and to minimize soil erosion. Typical BMPs include: (1) encompassing excavated material and disturbed soil with silt fence and/or bio-rolls; (2) protecting exposed soil with temporary seed mixes or hydro-mulches; (3) covering slopes with erosion control blankets and mulches, and (4) restoring disturbed areas as soon as practicable.

4.14 Geologic and Groundwater Resources

4.14.1 Description of Resources

Bedrock aquifers in the Project Area consist of the Maquoketa Shale and Dubuque Formation, which is comprised of tan limestone or dolomitic limestone (DNR 1974). These materials yield water from fractures and solution cavities, and have a thickness of about 100 feet. Based on mapping from the Minnesota DNR Division of Waters, the bedrock surface within the project area is generally around 1,100 feet. With most of the project area ranging in elevation from 1,200 to 1,300 feet above mean sea level, bedrock would likely be encountered between 100 and 200 feet beneath the ground surface. No bedrock outcrops are known to exist within the Project Area.

Additionally, Minnesota Karst Lands mapping was reviewed for karst geology in the vicinity of the project area (E. Calvin Alexander, University of Minnesota, 2002). All of Steel County contains covered karst geology, which is categorized as areas underlain by carbonate bedrock with more than 100 feet of sediment cover. Portions of southeastern Minnesota near the project area have transitional karst, which are regions underlain by carbonate bedrock and only 50-100 feet of sediment cover. Some karst features, such as caves and sinkholes, have been known to occur in transitional karst areas.

The County Well Index (CWI) indicates that there is one domestic well located within the Project Area (see **Exhibits 5 and 7**). However, given that there are roughly 22

residential units located within the boundaries of the project, the true number of domestic groundwater wells is probably closer to 22. According to Water Resources of the Cannon River Watershed mapping (DNR 1974), groundwater used in the project area is mainly drawn from the Maquoketa, Dubuque, and Galena formations. Domestic groundwater supply appears to be fairly accessible in the Project Area, although it tends to be quite hard with dissolved solids, and susceptible to pollution through sinkholes. However, there are currently no wellhead protection or special well construction areas in place in the County, and the Minnesota Department of Health has not considered Steele County a high priority area for these programs.

Recharge of groundwater in the Project Area occurs primarily from infiltration of precipitation within upland areas. From these upland areas, groundwater percolated downward and is discharged primarily along stream and river corridors as base flow. Infiltrated precipitation within the County generally moves laterally towards either the Cannon or Straight Rivers. According to the National Hydrography Dataset, streams and ditches primarily occur within the eastern half of the Project Area (**Exhibit 15**). Consequently, precipitation falling within the upland areas of the project site likely infiltrates the glacial deposits and slowly discharges as base flow in tributaries and ditches that eventually flow southwest to the Straight River.

4.14.2 Impacts

No impacts to geologic and groundwater resources are anticipated as a result of construction or operation of the Project. Proposed turbine locations appear to be in areas where bedrock will not be encountered during construction. Water supply requirements for the Project will be limited and relate to temporary water needs for construction activities.

4.14.3 Mitigation

No impacts to geologic and groundwater resources are anticipated and no specific mitigation measures are proposed. Oak Glen Wind will follow MDH regulations concerning Environmental Bore Holes and well installation, if needed, for the Project.

4.15 Surface Water and Floodplain Resources

4.15.1 Description of Resources

The Project Area is dissected by a number of intermittent ditches, streams and perennial waterways. The Project is drained by the Cannon River Watershed. The Straight River passes through the Project Area and flows to the north where it eventually empties into the Cannon River and ultimately the Mississippi. MnDNR mapping indicates that 2 streams designated as Public Watercourses by the Public Waters Inventory (PWI) exist within the Project Area (**Exhibit 15**). One stream is unnamed and passes through

approximately 0.6 miles of the extreme southeast portion of the Project between the Myron Buelow WMA and the Pogones Marsh WMA (**Exhibit 10**). The other is the Straight River which originates northeast of the Project at Oak Glen Lake and passes through 2.7 miles of the eastern portion of the Project. Three intermittent streams/ditches drain into the Straight River which are dispersed throughout the Project Area. No MnDNR designated trout streams are located within the Project Area.

NWI mapping indicates that approximately 25 acres of wetlands are located within the Project Area (**Exhibit 15**), which represents less than 1% of the overall area of the Project. Most of the wetlands are isolated and not connected by surface waters. Wetlands are discussed in further detail in Section 4.16.

One MnDNR Public Water is mapped within or directly adjacent to the Project Area. This is Rickert Lake (6P) which narrowly intersects the Project and is surrounded by both the Myron Buelow WMA and the Rickert Lake State Game Refuge. Rickert Lake is the only body of water within or adjacent to the Project Area and is located along the extreme southeastern boundary. The use of shoreland, which is defined as land within 300 feet of a Public Watercourse or 1,000 feet of a Public Water, is regulated by the statewide minimum shoreland standards (Chapter 6120), and the Steele County Shoreland Ordinance.

Federal Emergency Management Agency (FEMA) Mapping was reviewed in a digital format to analyze the extent of floodplains within the Project Area (**Exhibit 15**). One floodplain, consisting of approximately 51 acres, was identified along the southern boundary of the Project near the convergence of the two Public Watercourses.

4.15.2 Impacts

Optimal turbine locations are those which are topographically elevated from their surroundings. Ideally, turbines are to be located on elevated uplands where they are not expected to affect streams, surface water bodies or floodplains. The Project Area is served by a regular mile by mile grid network of county and township roads, which will provide flexibility in the avoidance of water features during the design process. Based on the current site layout, no impacts to streams, wetlands, floodplains, or shorelands are anticipated. As the design of the Project moves forward, Oak Glen Wind will coordinate with the St. Paul District of the U.S. Army Corps of Engineers (USACE), and the Steele Soil & Water Conservation District (SWCD) to obtain concurrence that stream and surface water body impacts are being avoided. Steele SWCD is the Local Government Unit (LGU) responsible for administering the Minnesota Wetland Conservation Act in this area, and the St. Paul District of the U.S. Army Corps of Engineers administers Section 404 of the Federal Clean Water Act. If wetlands cannot be avoided, the permitting process to be followed is described in Section 4.16.

The Minnesota Pollution Control Agency (MPCA) administers the National Pollutant Discharge Elimination System (NPDES) permit program in Minnesota and regulates construction activities that disturb more than one acre of land. As part of its NPDES permit application, Oak Glen Wind will develop a Storm Water Pollution Prevention Plan (SWPPP) to identify erosion and sedimentation control measures to prevent adverse water quality impacts to streams and wetlands during and after construction. Measures included in the SWPPP should be sufficient to ensure that streams and surface waters on the project site do not incur adverse construction-related stormwater impacts.

The Steele SWCD has a Comprehensive Plan for 2006 - 2010. The plan highlights existing and potential water issues and sets specific actions to achieve goals for sound hydrological management of water resources in the County. Priority concerns in the County include: (1) Water Quality, (2) Erosion by Water, (3) Drainage Problems, (4) Erosion by Wind, (5) Public Awareness, (6) Loss of Wetlands, and (7) Flooding. The project proposer is committed to addressing these priority concerns as they apply to the project by: insuring minimum development impacts to surface waters, using best management practices to reduce soil erosion, and by adhering to shoreland and floodplain requirements.

4.15.3 Mitigation

No surface water or floodplain mitigation is anticipated at this time, as Oak Glen Wind is planning on avoiding impacts through design. Potential impacts from construction storm water discharges will be mitigated through the application of BMPs that will be implemented as part of the SWPPP for the Project.

4.16 Wetlands

4.16.1 Description of Resources

Data used to assess wetland conditions in the Project Area were obtained from the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD). These combined datasets serve as a reliable reference to document the existence and approximate location of wetlands and waterways (**Exhibit 15**). A field review of wetlands within the Project Area will be completed in spring 2010 prior to project construction.

Based on NWI data, the Project Area consists of 21 wetlands covering approximately 25 acres (0.8% of Project Area). Of these wetlands, three occur in forested areas (PF01A), two have been partially excavated (PUBFx), and two have been partially drained (PEMFd and PEMCd). Most of these wetlands are isolated, and not connected to other navigable waters. Additionally, all but four wetlands are less than one acre in size.

Table 4-16 provides a breakdown of the results of the NWI analysis summarized by the type of wetlands present.

Wetland Type	Count	Acres by Type
L1UBH	1	0.03
PEM/SS1Cd	1	0.65
PEMC	9	5.1
PEMCd	1	0.52
PEMF	3	11.59
PEMFd	1	0.47
PFO1A	3	6.05
PUBFx	2	0.4
Totals	21	24.81

Natural Heritage Information System (NHIS) records from the MnDNR indicate that a calcareous fen exists a half mile south of the Project Area in the Pogones Marsh WMA. This particular fen is not designated as an outstanding resource value water by the MnDNR. However, fens are rare and sensitive and carry special protections under the Minnesota Wetland Conservation Act.

4.16.2 Impacts

Impacts typically associated with projects like this one include the conversion of wetland to upland to accommodate project infrastructure including turbines, access roads or associated facilities. Impacts to wetlands are not anticipated at this time; however, a minor amount of impact may be necessary for road crossings. Access roads are more likely to necessitate a stream crossing rather than impacting an isolated wetland impact. If it is determined that impacts are unavoidable, they will be minimized to the extent possible in accordance with sequencing and replacement requirements of the Minnesota Wetland Conservation Act (WCA) and Section 404 of the Federal Clean Water Act (CWA).

On January 14, 2010 Westwood Professional Services received a response letter from David Studenski, St. Paul District of the U.S. Army Corps of Engineers (**Appendix C**) in response a project notification letter mailed on January 7, 2010. The letter provides general information concerning the regulatory process and outlines the analyses involved with the application process and the activities which would trigger the need for an application.

Activities regulated by the Corps would include the installation of underground utilities through waters of the U.S. if there is discharge of dredge or fill material. However, underground utilities installed using vibratory plow and directional bore methods would not require a permit unless there is the need to excavate or backfill at the location of connecting points. Temporary placement of fill material into any waterbody or wetland

for purposes of constructing bypass roads, temporary stream crossings, cofferdams, or storage sites may require a Corps permit as well.

4.16.3 Mitigation

Given the isolated nature of the wetlands found within the Project Area, mitigation should not be required as wetlands should be relatively avoidable. Based on the findings of the wetland field review and final siting of turbines, access roads, collection lines and associated facilities for the Project, wetland delineation may be required for those wetlands and stream crossings that cannot be avoided, or are in close proximity to proposed structures. If some wetlands are determined to be unavoidable, a wetland delineation will be completed and a wetland replacement plan submitted for review by the USACE, Steele SWCD, BWSR and possibly the MnDNR.

If impacts are unavoidable, mitigation will be necessary if the areas impacted exceed de minimis exemption thresholds (e.g. the maximum amount of wetland fill permitted without necessitating replacement). If replacement is necessary, a wetland replacement area will be constructed onsite, or Wetland Bank Credits from an approved wetland bank in the same Wetland Bank Service Area of the impact will be purchased.

4.17 Vegetation

4.17.1 Description of Resources

The Project Area lies within a portion of the state that was historically covered predominantly with oak openings and barrens, wet prairie, and prairie. However, with the exception of steep slopes and drainages, virtually all of the native vegetation in the Project Area has been converted to agriculture. The National Land Cover Dataset (NLCD) indicates that the vast majority of the Project Area consists of agricultural land (**Exhibit 11**). About 74.9% of the Project Area is mapped as agriculture on the NLCD, 10.9% grassland/herbaceous, 6.9% developed land (farmsteads and roads), 1.3% deciduous forestland, 5.4% pasture/hay, 0.6% wetland, and <0.1% open water. A site visit by WEST, Inc. biologists on April 1, 2009 confirmed the predominant agricultural land use. All preliminary turbine locations are sited in agricultural fields, according to NLCD mapping and available aerial photography. Access roads and cable routes are currently being designed, and are expected to avoid groves of trees and shelterbelts. Furthermore, turbine and access road locations will be sited to avoid established woodlands, grasslands, and waterways to the degree possible.

The Minnesota County Biological Survey for Steele County was in progress in 2009, but results have not yet been published. However, Native Plant Communities and Rare Species records were obtained through NHIS data. Two NHIS requests have been obtained for Oak Glen Wind (December 5, 2008 and April 9, 2009). However, both are out of date and the Project Area has changed. A current request was submitted January 5,

2010 and is yet to be returned. To assess NHIS information in the Project Area, Oak Glen Wind used NHIS data licensed to Westwood Professional Services, Inc. (Westwood), current as of January 2010, and the results of previous coordination. Westwood's license agreement with the MnDNR prohibits providing specific locations of rare or sensitive species. However, the data can be masked to show either generalized species (i.e., a vertebrate animal instead of the species name) or generalized location (i.e., a section instead of a point location). Westwood reviewed the Project Area for NHIS records of rare or sensitive plant species. There are no records entirely within the Project Area, but several partially within or within one mile of the Project. The record partially within the northeast portion of the Project Area is that of plains wild indigo (special concern species), which is likely associated with the Oak Glen WMA or the railroad right-of-way prairie along I&M Railroad and US Highway 218 (east of the project area). There are several other records of plains wild indigo and rattlesnake-master (special concern species) along the railroad right-of-way prairie and a calcareous fen in the Pagonos Marsh WMA south of the Project Area. No federal or state listed plants have been recorded in the Project Area. Additionally, WEST, Inc. biologists note that very few areas were observed from public roads that were obviously native prairie (West 2009).

4.17.2 Impacts

Impacts to native vegetation are not anticipated as a result of the proposed Project. Proposed turbine locations will be located on primarily agricultural lands, and access roads will be sited and connected to public roads while avoiding woodlands, grasslands and wetlands to the degree possible. Similarly, it is anticipated that collection/feeder lines and transmission lines can be sited to avoid such resources.

4.17.3 Mitigation

Because impacts to native vegetation are not anticipated, no mitigation measures are proposed at this time.

4.18 Wildlife

4.18.1 Description of Resources

Wildlife species in the Project Area are those common to agricultural areas of south-central Minnesota. Mammals likely using the area include white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes fulva*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), cottontail (*Sylvilagus floridanus*), pocket gopher (*Geomys bursarius*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), gray and fox squirrels (*Sciurus carolinensis* and *S. niger*), striped skunk (*Mephitis mephitis*), badger (*Taxidea taxus*), meadow vole (*Microtus pennsylvanica*) and white-footed mouse (*Peromyscus leucopus*). Bat species that could be found in the Project Area include the big brown bat

(*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*). All of these species are common and abundant and no state or federally listed bat species are known or believed to occur in the Project Area.

Bird species found in the cultivated portions of the Project Area include crows (*Corvus brachyrhynchos*), rock doves (*Columbia livia*), brown-headed cowbirds (*Molothrus ater*), house sparrows (*Passer domesticus*), mourning doves (*Zenaida macroura*), European starlings (*Sturnus vulgaris*), American robins (*Turdus migratorius*), barn swallows (*Hirundo rustica*), and American goldfinches (*Carduelis tristis*). The cultivated areas of the site also likely support red-tailed hawks (*Buteo jamaicensis*) and American kestrels (*Falco sparverius*). The Project Area has limited habitat for waterfowl, wading birds (e.g. herons and egrets) or shorebirds on scarce wetlands, but lakes adjacent to the Project Area may provide more suitable habitat. There is a colonial waterbird nesting site associated with Oak Glen Lake, utilized by red-necked grebes (species in greatest conservation need on Minnesota's Wildlife Action Plan) (MN DNR 2006).

Amphibian and reptile species found in the Project Area are limited due to the scarcity of wetlands. This is particularly true of frog and turtle species that require surface water. There is a Blanding's turtle record from 1956 south of the Project Area and likely associated with the Pagones Marsh WMA. Other species of amphibians such as the Western chorus frog (*Pseudacris triseriata*), American toad (*Bufo americanus*) and the Tiger Salamander (*Ambystoma tigrinum*) may utilize the habitat along drainage ditches and streams in the Project Area. Common upland snakes in the area include common garter snake (*Thamnophis sirtalis*), redbelly snake (*Storeria occipitomaculata*) and fox snake (*Elaphe vulpine*).

4.18.2 Impacts

Wildlife habitat impacts are expected to be minimal because turbines and access roads will be placed exclusively on agricultural land. It is estimated that less than 1% of the land area within the Project Area will be affected by construction. Grasslands, forested areas, streams/drainages, and wetlands will be avoided whenever possible.

The Project Area has similar general habitat and wildlife species composition as many other wind farms in the upper Midwest, and it is anticipated that bird fatality rates documented at other locations will be similar to the proposed Project. Studies outside of California have identified an average of 1.83 fatalities/turbine/year for all birds (0.006 are raptors). Studies at nearby Buffalo Ridge in Lincoln County, Minnesota estimated 0.98 fatalities/turbine/year (West 2001). Potential indirect impacts to breeding birds due to displacement by turbines and roads are anticipated to be negligible because turbines will be exclusively on cropland.

Potential bat roosting habitat at the site includes trees and old farm buildings. Stands of trees are relatively sparse. Bats may forage over the entire Project Area, although the extent of use is not known. Bat fatalities have been reported for most wind farms where post-construction monitoring data is available. Reported estimates of bat mortality at wind farms through 2001 ranged from 0.07 to 10 bats/turbine/year. Bat fatality rates in the Upper Midwest are estimated at 1.7 bats/turbine/year or 2.7 bats/MW/year (NWCC 2004). Most documented bat fatalities at wind farms have been migratory species that conduct long migrations between summer roosts and winter hibernacula. The exact magnitude of these mortalities and the degree to which bat species may be affected is difficult to determine. The relatively flat to gently undulating topography of the Project Area does not appear to contain topographic features that would funnel bat movements during migration.

The overall impact of the proposed Project on wildlife is expected to be minimal. Operation of the wind farm will not change adjacent land uses and a relatively small portion of the Project Area will be affected by construction activities. Also, because all wind farm facilities will be sited on agricultural land, habitat impacts are expected to be negligible. There is some potential for avian and bat collisions with facility turbines, but these impacts are unlikely to be significant.

Oak Glen Wind requested up-to-date comment letters from both the MnDNR and USFWS on January 7, 2010. Westwood also requested an up-to-date NHIS request from the MnDNR. Two previous NHIS data requests were received December 5, 2008 and April 9, 2009, but that information is out of date and the Project Area has since been modified to address comments received from agencies regarding wildlife and sensitive habitats. Several MnDNR concerns in the 2008 NHIS letter were addressed by substantially revising the Project Area, including excluding WMAs (with the exception of a very small portion of the Myron Buelow WMA) and maintaining adequate distance from known rare species records and potential habitats that support these species in the Project vicinity. Both the MnDNR and USFWS typically recommend pre- and post-construction avian monitoring. Pre-construction avian monitoring studies were completed in spring, summer, and fall 2009 by WEST, Inc. Surveys characterized the bird community during migration and breeding seasons, analyzed an index to collision risk, and recorded threatened and endangered species. Results of these point count surveys in migration and breeding seasons are forthcoming.

4.18.3 Mitigation

Wildlife habitat impacts will be mitigated by: (1) siting turbines, roads and other facilities on cultivated/agricultural land rather than natural wildlife habitat; (2) using tubular monopole towers to minimize perching; (3) placing electrical collection/feeder lines underground; (4) implementing a Wildlife Response Reporting System (WRRS) once turbine construction is completed (The WRRS will include protocols for field technicians during routine maintenance operations to report and document avian mortalities); (5) Minimally lighting turbines and Met towers while meeting FAA

requirements; (6) designing to avoid impacts to wetlands, streams and forested areas to the extent practicable, and (7) minimizing other Project infrastructure.

4.19 Rare and Unique Natural Resources

4.19.1 Description of Resources

Oak Glen Wind reviewed publicly available sources of information regarding federal and state-listed threatened and endangered species known or likely to be found within the Project Area. A formal Natural Heritage Information System (NHIS) data request was submitted to the Minnesota DNR (MnDNR) Natural Heritage Program, which maintains the most up-to-date database of rare species records. As previously mentioned, the responses already received by Oak Glen Wind (December 5, 2008 and April 9, 2009) are out of date. Therefore, a more current request was made January 5, 2009. Until these formal results are received, Westwood's licensed NHIS data (current as of January 5, 2010) will be used in combination with the results from previous requests. There are 10 records in the Project Area or one-mile buffer; only one record partially overlaps the Project Area.

Federally Listed Species

The USFWS maintains a list of federally listed threatened and endangered species that are known or have the potential to exist in Minnesota counties (USFWS 2009). One federally listed species potentially occurring in Steele County is the dwarf trout lily (*Erythronium propullans*). Dwarf trout lily is found on north facing slopes and floodplains in deciduous forests. This plant species is listed as endangered by the USFWS. According to MnDNR NHIS records, there are no dwarf trout lily records in the project vicinity. Additionally, the Project Area lacks steep slopes and deciduous forests, and the species is therefore very unlikely to be present. Accordingly, no federally listed threatened and endangered species are expected to exist in the Project Area.

Similar to MnDNR coordination, a USFWS comment letter received May 19, 2009 is out of date because substantial changes to the Project Area have been made since the original letter request. At the time of this letter, there were "no records of federally-listed threatened or endangered species or critical habitat at the project site." Oak Glen Wind requested comments on the current Project Area on January 7, 2009. As of this time, the USFWS has only responded that they have received the request letter and will be preparing a response in the near future. Oak Glen Wind will follow up with the USFWS and coordinate potential concerns it may have regarding threatened or endangered species and the Project. Once a more complete understanding of USFWS concerns is developed, Oak Glen Wind will work with the USFWS to address them.

State-Listed Species

As previously discussed, the Minnesota County Biological Survey data for Steele County have not yet been published by the MnDNR. However, Native Plant Communities and

Rare Species records were obtained through the NHIS request. Westwood's licensed data show plains wild indigo (2 records), rattlesnake-master (4 records), one calcareous fen, one Blanding's turtle, one loggerhead shrike, one colonial waterbird nesting site, and one mussel sampling site in the Project Area and one-mile buffer. There are no records entirely within the Project Area. All records are in the one-mile buffer except one, which is partially within the Project Area, but likely associated with Oak Glen WMA or the railroad prairie along I&M Railroad (outside the Project Area).

In order to further assess the likelihood that state-listed threatened, endangered and special concern species might be potentially found in the Project Area, the life histories and distribution data for each of the listed species for Steele County were researched from the Minnesota DNR Website (MN DNR 2010). None of the seven listed plant species are known to occur in the Project Area. Most listed plant species are associated with sand and gravel prairies, high quality native dominated sedge meadows and floodplain forests along larger rivers. Some species are associated with high quality remnants of habitat types that occur in the Project vicinity (i.e., the railroad right-of-way prairie associated with I&M Railroad), but impacts are not expected as these features are outside the Project Area. Due to the extent of agricultural disturbance, it is unlikely that state-listed plant species exist in the Project Area.

The Minnesota DNR lists three bird species, two reptiles, and seven mussel species found in Steele County as endangered, threatened or special concern. All three avian species have specific habitat requirements: loggerhead shrike (threatened) characteristically inhabits open grassland with sparse trees or hedgerows for nesting; Henslow's sparrow (threatened) inhabits uncultivated grasslands that are often wet; and the short-eared owl (special concern) typically inhabits wet meadows and marshlands. There are NHIS records of all three species in Steele County; more specifically the loggerhead shrike has been reported adjacent to the western project boundary as recent as 2007. Due to their specific habitat requirements and the lack of suitable habitat in the Project Area, there is low potential for these species to breed in the Project Area.

Two reptile species are known to occur in Steele County: wood turtle and Blanding's turtle. Both are threatened species but occupy different habitats. The wood turtle characteristically inhabits small to medium sized fast moving streams and rivers, while the Blanding's turtle inhabits calm, shallow wetlands rich with aquatic vegetation and sandy uplands. There is no suitable habitat in the Project Area for wood turtles and limited habitat for Blanding's turtle.

Seven species of mussel are listed for Steele County. All of these species' records in Steele County are associated with the Straight River system. Due to the lack of suitable aquatic habitat, it is unlikely that any of the listed mussel species exist within the Project Area.

Overall potential for rare species to occur in the Project Area is low. The forthcoming responses from state and federal wildlife agencies will shed additional light on potential

concerns specific to the current Project Area. Additionally, the Avian Monitoring Plan by WEST, Inc., for which field work was completed in spring, summer, and fall 2009, will provide additional information regarding the avian community at Oak Glen Wind Farm, and specifically if rare species were observed.

4.19.2 Impacts

Based on the few rare species records in the Project vicinity, and lack of suitable habitat to support rare species in the Project Area, no adverse impacts to rare and unique resources are anticipated from the Project.

4.19.3 Mitigation

Mitigation of potential impacts to rare and unique resources will be in the form of avoidance. The siting of turbines, access roads and other infrastructure will be carried out in a manner that avoids impacts to rare plant communities and threatened, endangered or special concern plant and animal species. Turbine and access road locations are expected to be entirely on agricultural/cropland so as to avoid potential rare or unique natural resources.

4.20 Summary of Preconstruction Inventories

Oak Glen Wind will conduct the following preconstruction inventories concerning the Project:

- Bird Monitoring Plan by WEST, Inc. (field work was completed in 2009, results are forthcoming);
- Archaeological survey; and,
- Wetland delineation and inventory.

Oak Glen Wind will submit copies of these preconstruction inventories to the PUC as they become available.

5.0 IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

The federal, state and local permits or approvals that have been identified as potentially being required for the construction and operation of the Project are provided in **Table 5-1**. Permits dependent on the final site layout will be applied for after receiving PUC approval, but prior to construction.

Table 5-1: Potential Permits and Approvals Required for Construction and Operation of the Proposed Facility		
Agency		Name and Type of Approval
Federal	Federal Aviation Administration	Notice of Proposed Construction or Alteration (within six miles of Public Aviation Facility and structures over 200 feet to complete a 7460 Proposed Construction or Alteration Form)
		Determination of No Hazard
	U.S. Army Corps of Engineers	Section 404 Permit (for discharges of dredged or fill material into waters of the United States, and adjacent wetlands)
State of Minnesota	Minnesota Public Utilities Commission	Large Wind Energy Conversion System (LWECS) Site Permit
	Minnesota State Historic Preservation Office	Cultural and Historical resources review; State and National Register of Historic Sites review
	Minnesota Department of Natural Resources	Public Waters Work Permit
		License to Cross Public Lands and Waters
	Minnesota Pollution Control Agency	NPDES Permit for Construction Activities and Storm Water Pollution Prevention Plan (SWPPP)
		License for Very Small-Quantity Generator of Hazardous Waste
		Section 401 Water Quality Certification
	Minnesota Department of Health	Plumbing Plan Review
		Water Well Permit
	Minnesota Department of Transportation	Utility Access Permit
		Highway Access Permit
Aviation clearance from Office of Aeronautics (review and approval of FAA 7460 permit, if needed)		
Oversize and Overweight Permit		
Local	Steele County	Building Permit
		Conditional Use Permit
		Access Permit
		Utility Permit
		Overweight/Overwidth Permit
	Steele County Soil and Water Conservation District	Wetland Conservation Act Approval

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Exhibits