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August 22, 2008

Dr. Burl Haar, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Wisconsin Power and Light Company
Docket No. ET6657/WS-08-573
Site Application Second Re-file

Dear Dr. Haar:

Wisconsin Power and Light Company (WPL) respectfully submits a revised Site Permit Application for the Bent Tree Wind Facility for re-filing. After discussions with the Minnesota Office of Energy Security, WPL is making public all information contained in the application, and revising page 16, Section 4.2.3 to request approval of towers between 80 and 100 meters, instead of only towers 80 meters tall.

Copies have been served on the Office of Energy Security and Attorney General-Residential Utilities Division.

Respectfully submitted,

Wisconsin Power and Light Company

By: */s/ Arshia Javaherian*
Arshia Javaherian
Regulatory Attorney

AJ/mml

STATE OF MINNESOTA

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

David C. Boyd	**Chair**
J. Dennis O'Brien	**Commissioner**
Thomas Pugh	**Commissioner**
Phyllis A. Reha	**Commissioner**
Betsy Wergin	**Commissioner**

In the Matter of Wisconsin Power and Light Company's Site Permit Application for a Large Wind Energy Conversion System	**DOCKET NO. ET6657/WS-08-573**

AFFIDAVIT OF SERVICE

STATE OF IOWA)
) ss.
COUNTY OF LINN)

Mary Margaret Lang, being first duly sworn on oath, deposes and states:

That on the 22nd day of August, 2008, copies of the foregoing Affidavit of Service, together with Wisconsin Power and Light Company's Site Application Second Re-file were served upon the parties on the attached service list, by e-filing, messenger, electronic mail, facsimile and/or first-class mail, proper postage prepaid from Cedar Rapids, Iowa.

/s/ Mary Margaret Lang
Mary Margaret Lang

Subscribed and Sworn to Before Me
this 22nd day of August, 2008.

/s/ Susan J. Gordon
Susan J. Gordon
Notary Public
My Commission Expires on 05-02-2011

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

Bent Tree Wind Project
Freeborn County, Minnesota

Docket No. ET6657/WS-08-573

Wisconsin Power & Light Company

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Appendices

1.0 INTRODUCTION

Wisconsin Power & Light Company (WPL) submits this application for a site permit to construct and operate the Bent Tree Wind Project (Project) to the Minnesota Public Utilities Commission (MPUC). The Project is a Large Wind Energy Conversion System (LWECS), as defined in the Wind Siting Act, Minn. Stat. § 216F.01. The Project is located in Freeborn County, Minnesota and will be up to 400 megawatts (MW) in size, consisting of up to 266 wind turbine generators. WPL has not made a final selection on turbines for the Project and proposes to permit the Project for a range in utility grade wind turbines from 1.5 MW to 2.5 MW (including but not limited to Vestas, GE or equivalent). Associated facilities include access roads, radial interconnection, an Operations and Maintenance (O&M) building, permanent meteorological towers and an electrical collection system. WPL expects to file a separate route permit application for the radial line in the third quarter of 2008.

While this application requests a site permit for a 400 MW facility, the Project is expected to come online in phases. WPL has filed a Certificate of Public Necessity and Convenience (CPCN) application with the Public Service Commission of Wisconsin (PSCW), and plans to file a Certificate of Need (CON) application in June 2008 with the MPUC for the first 200 MW, assuming commercial operation by the end of 2010. The commercial operation date of the first phase is dependent on the completion of interconnection to the electrical grid, permitting, and other development activities. The remaining 200 MW capacity will be held in abeyance for a need determination, with schedule dependent on factors including Renewable Portfolio Standard (RPS) requirements and WPL's integrated resource plan.

WPL is committed to optimizing the wind resource for the Project. All decisions with respect to the equipment selection and availability, site layout, and spacing are designed to make the most efficient use of land and wind resources, while complying with all applicable rules and regulations related to Minn. Rule 7836.

1.1 PROJECT SUMMARY

WPL expects it will design, construct, finance, operate, and maintain the Project. WPL proposes to build a wind facility of up to 400 MW in northwest Freeborn County, in south central Minnesota, approximately 4 miles northwest of Albert Lea, Minnesota (Project Area). The Project Area was identified based on wind resource, transmission access, and other relevant siting factors. The Project Area comprises an area of approximately 32,500 acres, composed primarily of agricultural land and rolling hills (Appendix A, Exhibit A-1).

The Project's turbines and associated facilities will be owned and operated exclusively by WPL. Energy generated will be used to meet WPL's RPS requirements pursuant to Wisconsin statute and to meet the energy demand of WPL's retail and wholesale customers.

The Project's conceptual array represents 400 MW, modeled using a 1.65 MW turbine. (Appendix A, Exhibit A-2).

WPL has entered into a Letter of Intent with Wind Capital Group LLC (Developer). The Letter of Intent provides for exclusivity and an option to purchase the site upon execution and closing of an Asset Purchase Agreement. The Developer is a wind energy development company headquartered in St. Louis, Missouri.

1.1.1 Proposed Site

The Project is in northwestern Freeborn County, Minnesota. The four townships encompassing the Project Area (Hartland, Manchester, Bath, and Bancroft) are zoned as agricultural with the exception of the incorporated towns of Hartland and Manchester. No turbines are expected to be placed within the incorporated areas. Letters from local government representatives, in support of the Project, are contained in Appendix B.

1.1.2 Projected Output

When completed, the full Project will have a nameplate capacity of up to 400 MW. Assuming net capacity factors of 37-39%, the projected average annual output will range from approximately 1,296,500 to 1,366,600 Megawatt-Hours (MWh). Output will be dependent on final design, site-specific features, and equipment.

1.1.3 Siting Plan

The turbines and associated facilities will be sited primarily on agricultural land in Freeborn County, Minnesota. WPL will prepare the final siting layout to optimize wind resources while minimizing the impact on land resources and potentially sensitive resources. The topography of the site and the selected turbine technology will dictate turbine spacing. A description of turbine technology is presented in Section 4.2, and a table of setback distances for specific turbines is located in Section 2.2, and is consistent with Minnesota rules regarding turbine placement.

1.1.4 Operation And Maintenance

The first phase of approximately 200 MW is expected to be operational by the end of 2010. WPL will be responsible for the O&M for the life of the Project, which will be a minimum of 25 years.

1.1.5 Site Control

The Project Area consists of approximately 32,500 acres. Currently, the Developer has options for approximately 24,000 acres. The remaining parcels are available for contingency should participants under option choose not to participate.

1.1.6 Permits And Licenses

Potential permits and approvals for the Project are identified in Section 6.0.

1.1.7 Development And Construction

WPL, the Developer, and WPL's engineering contractor will perform or manage all development activities. Specifically, WPL and Developer will:

- Perform site resource analysis;
- Undertake environmental review; and
- Obtain specific permits and licenses for the Project.

Under the oversight of WPL's staff, the engineering and construction contractors will:

- Perform civil engineering for access roads and turbine foundations;
- Construct foundations, towers, and transformers;
- Assemble and install turbines;
- Install the communication system, including telephone and fiber-optic cable, and Supervisory Control and Data Acquisition (SCADA) software and hardware;
- Construct the electrical feeder and collection system; and
- Construct radial interconnection.

1.2 COMPLIANCE WITH THE WIND SITING ACT AND MINN. RULE 7836

The Wind Siting Act requires an application for a site permit for a LWECS to meet the substantive criteria set forth in Minn. Stat. § 216E.03, subd. 7. This application provides information necessary to demonstrate compliance with these criteria and Minn. Rule 7836. 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 (Minn. Stat. § 216F.03).

Minn. Rule 7836 governs the contents and treatment of applications for LWECS site permits under the Wind Siting Act. To the extent available, WPL has presented information required by Minn. Rule 7836 (see Appendix C). Additionally, sufficient Project design, wind resource, and technical information have been provided for a thorough evaluation of the reasonableness of the Project Area as a location for the Project.

1.2.1 Certificate Of Need

Under Minn. Rule 7836.0500, subp. 2, a CON is required from the MPUC. A CON application for the first 200 MW phase of the Project will be submitted by June 30, 2008, and approval is expected in the fourth quarter of 2008, or early in the first quarter of 2009.

2.0 GENERAL DESCRIPTION OF THE PROPOSED FACILITY

A general description of the proposed facility is provided below.

2.1 WIND POWER TECHNOLOGY

A wind turbine has five major components: nacelle, hub, blades, tower, and foundation. The nacelle houses the generator, gear boxes, upper controls, generator cabling, hoist, generator cooling, and other miscellaneous equipment.

The nacelle supports the anemometer and Federal Aviation Administration (FAA) lighting. The nacelle may consist of a jib hoist to assist with maintenance and repairs. The hub supports the blades and connecting rotor, yaw motors, mechanical braking system, and a power supply for emergency braking. The hub also contains an emergency power supply to allow the mechanical brakes to work if electric power from the grid is lost. Each turbine has three blades composed of carbon fibers, fiberglass, and internal supports to provide a lightweight but strong component. The blades also contain lightning receptors at the tip of each blade.

The tower supports the nacelle, hub, and blades. The tower also houses electrical, control, and communication cables and a control system located at the bottom of the tower. Towers may include lifts for use by Project personnel. Towers are solid tubular in design and are painted a non-glare white. Electrical equipment at the base of the tower conditions the generated electricity to match electric grid requirements. The expected tower foundation will be a spread foundation design. The tower foundation will be located below ground level except for approximately 18 inches that will remain above-ground, allowing the tower to be appropriately bolted to the foundation.

The wind turbine blades convert the energy of wind into rotational energy. An anemometer located on the turbine nacelle continuously senses wind speed and wind direction. The hub and nacelle are constantly being rotated to match wind speed direction. Yaw motors rotate the blades to optimize blade angles in relation to wind speed and direction. Blades are continuously yawed into the wind by motors contained within the hub to optimize energy production. The hub contains a large bull ring gear to transfer mechanical force from the blades to the shaft connecting the hub to the gear box located within the nacelle. The mechanical braking system, located within the hub, locks the blade rotor to prevent the blades from spinning during maintenance periods or other times when the turbine is out of service. The gear box adjusts shaft speeds to match the required generator speed. Electricity is produced by the generator and transmitted through insulated cables to the power conditioning unit located at the base of the tower.

WPL intends to use wind turbines with the latest efficiency ratings and control technologies. WPL will select turbine technology that maximizes turbine efficiency from an energy production and wind-plant economics standpoint. Today's turbines contain technology options that allow the purchaser to determine the turbine best suited for the site. Turbine control technologies have been steadily advancing over the past decade or so, allowing for increased efficiency and a closer match to the operating requirements of the electric grid.

The wind turbine generates electricity at a low voltage (1,000 volts or less), which must be stepped up to a higher voltage to avoid excessive electrical losses on the collector system before being sent to the central Project substation. This voltage is stepped up to 34.5 Kilovolts (KV) by

a transformer located outside and adjacent to the turbine tower. The collector system gathers the electricity from each of the turbines and transmits this electricity to the Project substation. At this time, WPL expects the collector system to be located entirely underground. Placing the collector system underground improves reliability and is non-intrusive to local land use. Each collector system circuit is limited to a loading of 25 MW or less. The Project substation will step the collector system voltage up to a voltage that will match the transmission grid voltage. The Project substation will be located within or near the Project footprint, and will consist of a large step-up transformer to match the transmission line voltage, as well as circuit breakers, a control building, switches, and other equipment normally associated with a substation. The Project substation will be connected to an electrical interconnection facility for final connection to the transmission grid.

2.2 WIND FARM PROJECT LAYOUT

WPL will develop a site layout for the land under easement that optimizes wind resources while minimizing the impact on land resources and any potentially sensitive areas.

The Project will consist of utility grade wind turbines in the 1.5 MW to 2.5 MW size range (including Vestas, GE, or equivalent). A preliminary site layout based on 1.65 MW turbines is included in Appendix A, Exhibit A-2.

Wind-powered electric generation is entirely dependent on the availability of the wind resource at a specific location. The energy available from the wind is proportional to the cube of the wind velocity. For example, a doubling of the wind velocity will increase the available energy by a factor of eight times. Analysis of wind direction data suggests that the optimal turbine string alignments are from west to east and from west-northwest to east-southeast. Turbine placement was designed to provide a minimum 3 Rotor Diameter (RD) crosswind spacing and 5 RD downwind spacing between turbines for up to 80% of the turbines. Design of the turbine array and collector system will minimize energy loss from wakes, turbulence, and electrical line losses.

The following Table 2-1 describes setback distances for the range of turbines under consideration for the Project.

Table 2-1 Setback Distances for Wind Turbines

Turbine Description	N-S Perimeter Setback	E-W Perimeter Setback
	5 RD (ft)	3 RD (ft)
1.5 MW Turbine with 78 m RD	1280 ft	768 ft
1.65 MW Turbine with 82 m RD	1345 ft	807 ft
2.4 MW Turbine with 98 m RD	1608 ft	965 ft
2.5 MW Turbine with 100 m RD	1640 ft	984 ft

Setbacks for public roads, transmission lines, and natural gas pipelines will be consistent with the MPUC's minimum guidelines of 250 feet, 400 feet, and 100 feet, respectively.

A minimum 1,000 feet setback from occupied structures has been included in the site plan, which exceeds the distance required to maintain less than 50 dBA (decibels, A-weighted), based on the turbines under consideration.

2.3 ASSOCIATED FACILITIES

For general access, the existing public highways and roads will effectively meet the needs of the Project. However, accommodation will be required to allow access to the turbines located in the Project Area. WPL will provide for the construction of access roads from the nearest public road to the turbines, with several turbines served from a single access road. WPL will carefully design the Project to keep required access roads to a minimum, thereby minimizing cost and land impacts. Access roads will be constructed in a manner to mitigate washouts and contamination of the surrounding agricultural land with gravel. Access roads consist of a breaker rock base and six-inch gravel overlay, and are typically twelve-feet wide, post-construction. Generally, the access roads will be used by small pickups and automobiles. WPL will retain a qualified contractor to maintain the access roads in a manner consistent with their intended use. During wind turbine construction, the access roads may be as wide as approximately 32 feet on a temporary basis. After wind turbine construction is complete, the width of the access road will be brought down to the 16-foot width, with the excess road being reclaimed and returned to its original land use. From time to time, small cranes or other small equipment may traverse the access road for maintenance needs. Large cranes also may need access for major repair of wind turbine components from time-to-time. In such event, WPL will provide temporary crane paths designed to mitigate impacts to the local land use. Road changes and/or additions will not be necessary for O&M.

A 161 KV radial line of up to 18 miles will be constructed from the Project substation to the point of interconnection at ITC Midwest's (ITC) existing Hayward Substation, or a closer substation that potentially could be built by ITC. WPL will construct, own, and operate this radial line as part of the Project. The radial line is expected to follow existing public road rights-of-way to the greatest extent possible, with the intent to mitigate impacts to the surrounding environment. A narrow profile-type construction will allow for a narrow line right-of-way. The radial line will be permitted in compliance with all local and State requirements.

2.4 LAND RIGHTS

WPL will obtain Wind Park Easement Agreements (Easement Agreement) to define the Project Area. The land rights for the Project and all associated facilities may include wind and buffer easements, turbines, access, transmission feeder lines located on public roads when necessary, and possibly land to mitigate environmental impacts incurred due to development. Wind access buffer easements will be in compliance with the required minimum of not less than 5 RD from the perimeter of the site on the north-south axis and 3 RD on the east-west axis where wind rights are not held, unless otherwise approved by the MPUC.

3.0 PROPOSED SITE

Information on the proposed site is provided below.

3.1 IDENTIFICATION OF PROJECT AREA

The Project Area in NW Freeborn County was selected because it offers a strong wind resource in an advantageous location. The Project Area is close to available transmission infrastructure, and landowner and community interest in participating in the Project is strong. Additionally, the site was selected with considerations for existing flight approach procedures into the Albert Lea municipal airport.

The Project Area encompasses approximately 32,500 acres, held by approximately 225 landowners. Table 3-1 shows the amount of land expected to be used by turbines ranging from 1.5 MW to 2.5 MW, including access roads. An additional 10 acres will be required for the substation and O&M building.

Table 3-1 Land Use Scenarios

Turbine Capacity (MW)	Number of Turbines	Approximate Occupied Acreage[1]
1.5	267	160
1.65	243	146
2.4	167	100
2.5	160	96

3.2 WIND RESOURCE AREAS – GENERAL

The United States Department of Energy and the Minnesota Department of Commerce (MDOC) have conducted wind resource assessment studies in Minnesota since 1982. In October 2002, the MDOC published the latest "Wind Resource Analysis Program" report that presents wind analysis data from monitoring stations across the state of Minnesota. The nearest station to the Project Area is located in Clarks Grove, Minnesota, approximately 3 miles east of the Project Area. In the vicinity of the Project Area, the mean annual wind speed at an elevation of 50 meters above ground level is mapped as 6.61 to 6.81 meters/second (m/s). At an elevation of 70 meters above ground level, mean annual wind speed is mapped as 7.01 m/s to 7.17 m/s. The MDOC's state-wide wind map produced by WindLogics in January 2006 estimates the 80 meter wind speed in the Project Area to average 7.7 m/s to 8.1 m/s (mean annual average). WPL has reviewed and analyzed meteorological information in the Freeborn County area and the Project Area. This information is described below in Section 3.3.

3.3 WIND CHARACTERISTICS IN PROJECT AREA

The Developer commissioned a site specific wind resource analysis from WindLogics. This study is based on over 40 years of meteorological data and provides virtual meteorological tower data. Additionally, two 60-meter meteorological towers are installed in the Project Area. The towers are installed at a latitude and longitude of 43.8252°, -93.4643° and 43.7407°, -93.481°.

[1] Assumes a factor of 0.6 acres per turbine.

Installation took place on November 13, 2007 and October 5, 2007, respectively. The meteorological towers are collecting wind speeds at 30 meters, 45 meters, and 60 meters, and wind direction at 44 meters and 59 meters. The returns from the meteorological towers have been consistent with the WindLogics analysis.

The MDOC has funded several tall tower studies and provided the data to the public. One such tall tower collected wind data at 70 meters near Clarks Grove, Minnesota from June 7, 1996 to July 10, 2004. This tower is approximately 3 miles from the Project Area and the data has been incorporated into this analysis.

3.3.1 Interannual Variation

The WindLogics study found the mean annual wind speed is predicted to be 8.00 m/s, with a range of 6.66 m/s to 9.38 m/s. This range translates to an approximate variation of plus or minus 17% from the mean.

3.3.2 Seasonal Variation

Table 3-2 shows the expected wind speeds in the Project Area at the 80-meter level based on the WindLogics study. The strongest winds are during January (8.75 m/s) and October (8.61 m/s). The summer months of July and August have the lowest average wind speeds of 6.72 m/s and 6.95 m/s, respectively.

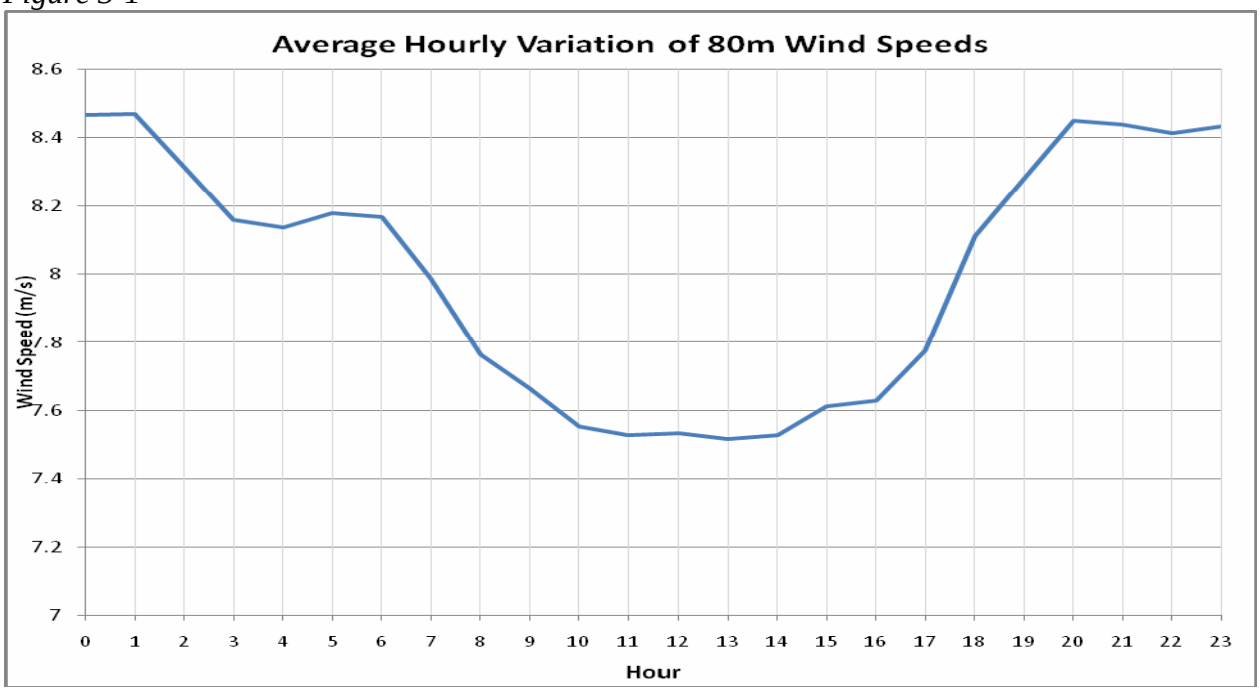
Table 3-2 Average 80 Meter Wind Speeds

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
Wind Speed (m/s)	8.75	8.26	8.42	8.33	7.76	7.29	6.72	6.95	7.88	8.61	8.58	8.53	**8.00**

3.3.3 Diurnal Conditions

Figure 3-1 shows the expected diurnal variations of 80-meter wind speeds. Wind speeds are generally greatest in the night and early morning hours and decline at midday.

Figure 3-1



3.3.4 Atmospheric Stability

Project specific atmospheric stability has not been calculated. Based on other regional atmospheric stability data, WPL expects the approximate atmospheric stability profile to be as follows: (a) Neutral - 15%; (b) Stable - 70%; and (c) Unstable - 15%.

3.3.5 Hub Height Turbulence

The Turbulence Intensity (TI) is defined as the measured standard deviation of wind speed over an hour, divided by the mean for the same time period. Table 3-3 shows expected TIs for wind speeds ranging from 5 m/s to 30 m/s. TI values of less than 16% are generally acceptable to most major turbine manufacturers.

Table 3-3 Turbulence Intensities

Wind Speed Range (m/s)	Average TI
5-10	14.09%
10-15	12.37%
15-20	12.87%
20-25	12.34%
25-30	14.30%

3.3.6 Extreme Wind Conditions

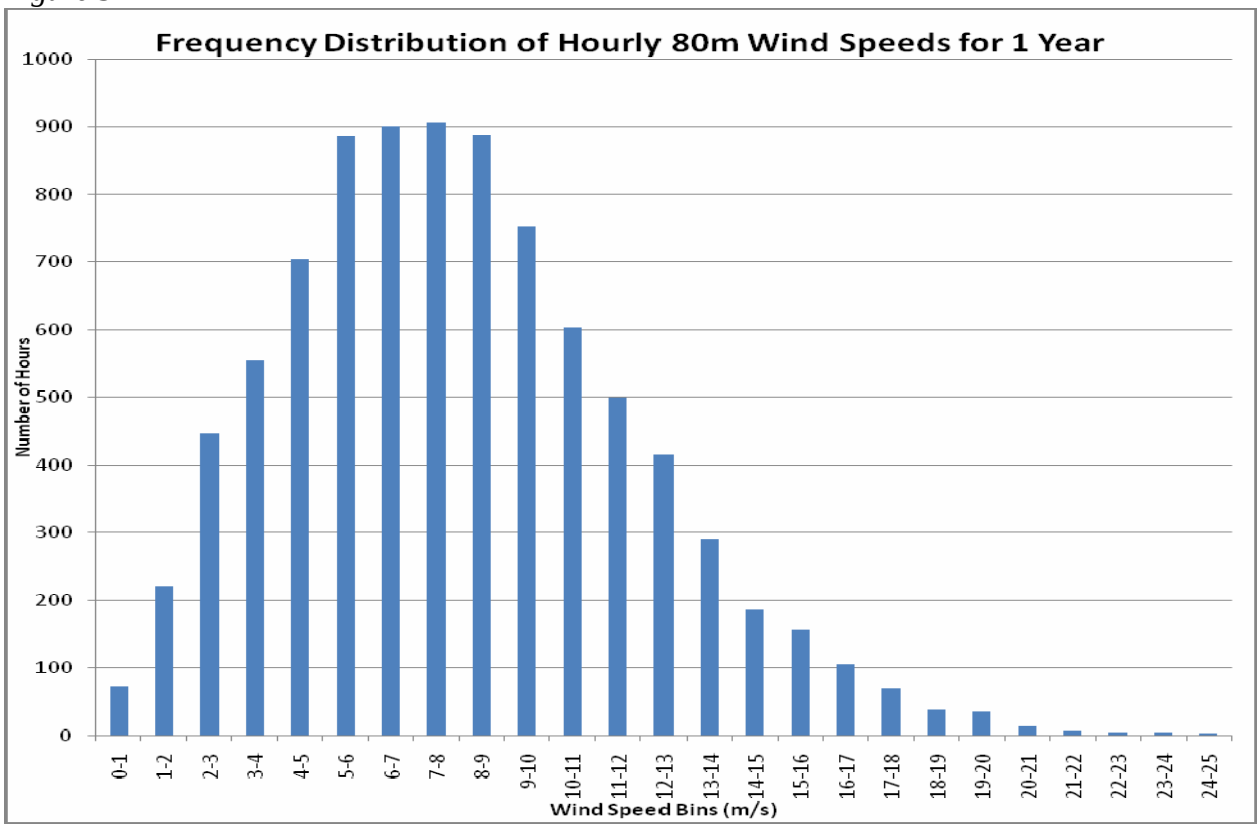
The maximum hourly 70-meter wind speed measured at the MDOC's Clarks Grove tower from June 1996 through July 2004 was 26.69 m/s. Using the 50-meter wind speed along with the 70-

meter wind speed to extrapolate to the hub height indicates a calculated wind speed of 28.28 m/s at 80 meters. Applying a conservative gust factor of 1.3, the expected highest one-second gust would have been 36.76 m/s. Extreme temperature range is expected to be between 40°C and -35°C. Glaze icing may occur up to 2% of the operating hours of the year for turbines located in southern Minnesota.

3.3.7 Wind Speed Frequency Distribution

Figure 3-2 presents a wind speed frequency distribution for the Project based on the WindLogics study. Eighty meter wind speeds range between 4 m/s and 13 m/s approximately 75% of the time, and between 5.5 m/s and 11 m/s approximately 50% of the time.

Figure 3-2



3.3.8 Wind Variation With Height

Wind shear is the relative change in wind speed as a function of height. Wind shear is calculated using a power function based upon the relative distance from the ground. The general equation used for calculating wind shear is $S/S_0 = (H/H_0)^{\alpha}$, where S_0 and H_0 are the speed and height of the lower level and α is the power coefficient. The power coefficient can vary greatly due to the terrain roughness and atmospheric stability. The power coefficient will also change slightly with variation in height. The vertical variation with height or shear coefficient is 0.18 based on the 50-70 meter level at the MDOC's Clarks Grove site.

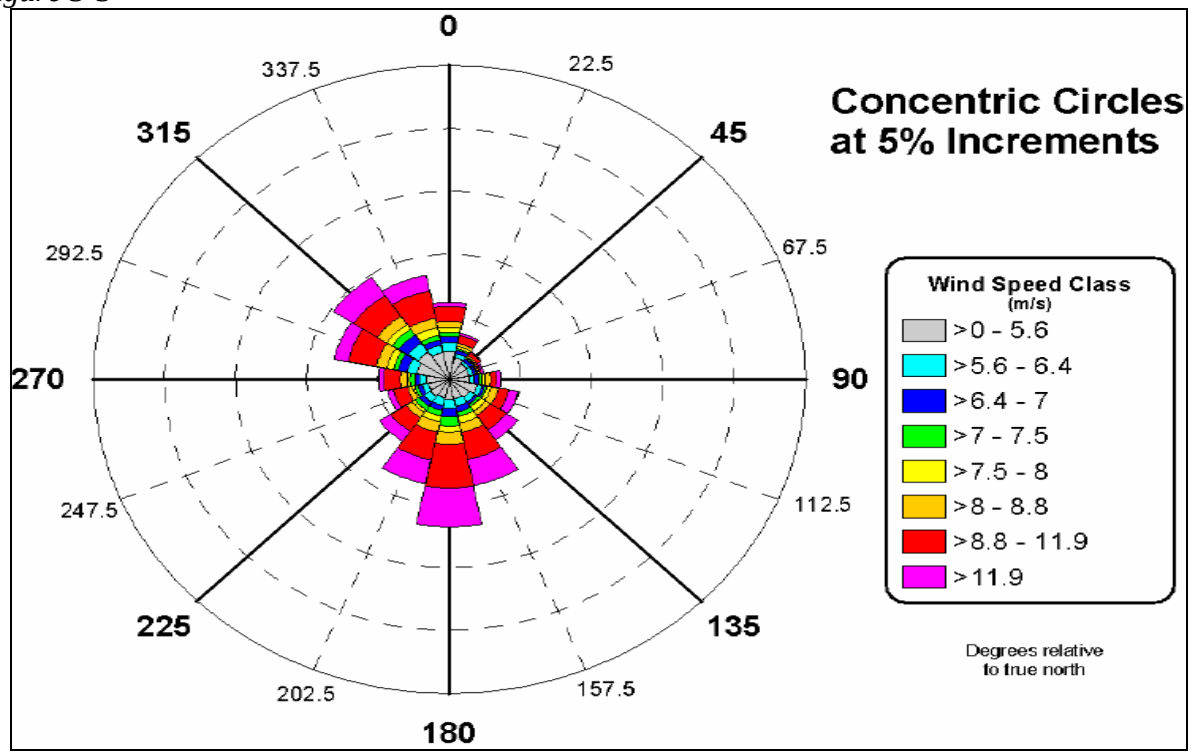
3.3.9 Spatial Wind Variation

The Project Area topography is characterized by a large area of high ground in the SE portion of the Project Area with ridges extending to the NE and SW. Smaller area NE-SW ridges exist to the NW of this large area of high ground. WPL expects locations with similar elevations to have similar wind speeds throughout the Project Area. No extreme slopes exist to drastically change the wind speed from one point to another. The two meteorological tower locations were selected to test for spatial wind variation.

3.3.10 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 in the Project Area depending on individual turbine height and exposure. The prevailing energy wind direction is SSE-SSW, with significant energy from the WNW-NNW sectors. Figure 3-3 shows the expected wind rose for the Project Area from the WindLogics analysis.

Figure 3-3



3.4 OTHER METEOROLOGICAL CONDITIONS

Information on other meteorological conditions is provided below.

3.4.1 Average And Extreme Weather Conditions

The Project Area has a climate that is characterized by cold winters and hot summers. Summers provide long periods of sunshine, and southerly winds bring warm, moist air from the south. In winter, the climate cools rapidly because solar insulation is reduced and northerly winds bring in cold, dry air from the north and west. The climate of the Project Area is quite uniform because there are no large bodies of water or sharply marked differences in topography within the area. No long-term data is available specifically for the Project Area. However, the data from Albert Lea, Minnesota, located approximately four miles to the SE, is representative of the site. Table 3-4 provides data on temperature and precipitation for the Project Area, as recorded at Albert Lea, Minnesota during the period 1987 to 2007. This period is assumed to be representative of the long-term climate conditions for the Project Area.

Table 3-4 Albert Lea Climate Averages

Month	Average Low (°F)	Average Mean (°F)	Average High (°F)	Average Precipitation (inches)*
Jan	10.08	16.93	24.79	0.87
Feb	14.80	21.56	29.82	0.67
Mar	25.50	32.34	41.24	2.02
Apr	37.54	46.28	57.51	3.39
May	49.41	58.35	68.96	4.18
Jun	59.68	68.43	78.48	4.79
Jul	63.35	71.67	80.77	4.15
Aug	61.10	69.22	78.58	4.51
Sep	52.63	61.40	72.46	3.05
Oct	40.73	49.00	59.57	2.52
Nov	27.69	34.08	42.18	2.00
Dec	16.12	22.43	29.74	1.00
Annual	**38.22**	**45.97**	**55.34**	**33.15**

* Precipitation measurements are liquid equivalents

Based on 68 years of climatic data records, the lowest temperature recorded at Albert Lea, Minnesota is -41 °F, which occurred during the month of January. The highest temperature recorded at Albert Lea, Minnesota, based on 69 years of climatic data records, is 106 °F in the month of July.

The National Climatic Data Center has records of 285 extreme weather events for Freeborn County from January 1, 1950 to March 31, 2007. Table 3-5 provides details for these extreme weather events.

Table 3-5 Freeborn County Extreme Weather Events

Weather Event	Number of Occurrences
Extreme Cold	4
Extreme Heat	7
Extreme Wind-chill	3
Flooding	10
Fog	1
Hail	71
Heavy Snow	45
High Wind	11
Icing	5
Thunderstorm	84
Tornado/Funnel Cloud	44

Tornadoes and severe thunderstorms strike occasionally. The state of Minnesota experiences an average of 25 tornadoes per year. Records from 1950 through 2005 indicate that the most number of tornadoes in a given year was 74 in 2001. These storms are localized and of short duration, resulting in damage to small geographic areas. Hail occasionally falls in scattered areas during the warmer periods. Neither hail nor lightning from severe storms presents a problem for operation of the Project. All turbines being considered for the Project have lightning protection systems. Turbines, however, are not designed to survive tornado force winds of 89+ m/s (200+ mph).

In the winter, icing events are variable in frequency. It is expected that the average annual energy loss will be approximately 1% or less due to icing. The turbines being considered for this Project are designed to withstand extreme weather conditions and will include accessory equipment for operation in cold weather. In high winds, the turbine blades "feather" into the prevailing wind direction to increase aerodynamics and reduce wind resistance, and the turbines shut down above the cut out wind speed (generally 25 m/s). In icy weather, the turbines stop turning due to loss of aerodynamics, as well as imbalance resulting from unequal ice loads.

3.5 ENERGY PROJECTIONS

Information on energy projections is provided below.

3.5.1 Proposed Array Spacing For Turbines

Generally, turbines will be placed along higher elevation features at the site to provide maximum exposure to wind resources. Turbine placement was designed to provide 3 RD crosswind spacing and 5 RD downwind spacing between turbines for up to 80% of the turbines. The spacing is dependent upon the selected equipment and the topography of the site.

3.5.2 Base Energy Projections

The Project will have a nameplate capacity of up to 400 MW. Assuming net capacity factors of 37-39%, projected average annual output will range from approximately 1,296,500 MWh to 1,366,600 MWh. Output will be dependent on final design, site-specific features, and equipment.

3.6 COST ANALYSIS

WPL has filed a CPCN application with the PSCW that includes an expected installed cost of approximately $497 million (including allowance for funds used during construction) for the first 200 MW phase expected to be online by 2010. The largest component in the total cost of the Project will be the turbine equipment. However; infrastructure costs for access road construction and electrical collection systems are also factors.

4.0 ENGINEERING AND OPERATIONAL DESIGN ANALYSIS

Section 4.0 and its subsections provide a summary description of the Project, which includes a description of the Project layout, turbines, electrical system, and associated facilities. Additional information is provided on construction, schedule, operation, and decommissioning of the site. WPL wishes to preserve the right to evaluate and select turbine equipment of varying sizes and outputs. The preliminary Project layout is based on optimizing the wind resource and construction costs within the Project Area. This optimization takes into consideration elevation, adequate turbine spacing to minimize turbulence (shadowing) affects among turbines, interconnect cable and access road lengths, as well as required setbacks from roads, buildings, homes, and other existing infrastructure. The final turbine micrositing process incorporates landowner input as to land use practices, nuances to each land parcel, and physical site visits.

4.1 BENT TREE WIND PROJECT LAYOUT AND ASSOCIATED FACILITIES

The Project will consist of turbines, an underground collector system and associated electrical equipment, access roads, two (2) permanent meteorological tower(s), a substation, overhead radial line, and an O&M building. The type and size of wind turbine has not been selected. The turbines will be connected by an underground collection system that will include both buried fiber optic communication cables and electric power cables. Pad mount transformers will be located adjacent to each turbine foundation. Cable vaults will be located at various locations within the Project Area allowing termination and splicing of the electric and communication cables.

A new substation will be constructed within or near the Project Area. See the Project map in Appendix A, Exhibit A-3 for the preliminary substation location. Underground cable and communication circuits composing the collector circuit will terminate within the substation. The substation will step the collector system voltage up to a voltage that will match the ITC transmission system voltage. The substation will consist of a large step-up transformer to match the transmission system voltage, as well as circuit breakers, a control building, switches, and

other equipment normally associated with a substation facility. The substation will be connected to the ITC system via a radial line.

Site work and road construction consists of constructing crane pads to support the erection cranes, construction of access roads, construction of laydown area(s) for large wind turbine components, construction of temporary turning radii on existing public roads, removal of excess access road width upon completion of turbine erection, and development of temporary crane paths if the need arises. The site work includes reclamation of the laydown area(s) to the original land use. Temporary turning radii are also reclaimed to original use or in other manners as directed by local governing bodies.

4.2 DESCRIPTION OF TURBINES

The turbine blades convert the energy of wind into rotational energy. An anemometer located on the turbine nacelle continuously senses wind speed and wind direction. The hub and nacelle are constantly being rotated to match wind speed direction. Yaw motors rotate the blades to optimize blade angles in relation to wind speed and direction. Blades are continuously yawed into the wind by motors contained within the hub to optimize energy production. The hub contains a large bull ring gear to transfer mechanical force from the blades to the shaft connecting the hub to the gear box located within the nacelle. The mechanical braking system, located within the hub, locks the blade rotor to prevent the blades from spinning during maintenance periods or other times when the turbine needs to be out of service. The gear box adjusts shaft speeds to match the required generator speed. Electricity is produced by the generator and transmitted through insulated cables to a power conditioning unit located at the base of the tower. This power conditioning unit conditions the electricity to match the requirements of the electric utility.

4.2.1 Turbine

The turbines under consideration for the Project will be designed and equipped to operate effectively in the climate experienced at the Project.

4.2.2 Rotor

The rotor supports the blades and connecting hub, yaw motors, mechanical braking system, and a power supply for emergency braking. The hub also contains an emergency power supply to allow the mechanical brakes to work should electric power from the utility grid be lost. Each turbine has three blades composed of carbon fibers, fiberglass, and internal supports to provide a lightweight but very strong component. The blades also contain lightning receptors at the tip of each blade with a copper pathway to carry energy from lightning strikes to the turbine ground grid. The hub is attached to the nacelle, which houses the gearbox, generator, brake, cooling system, and other electrical and mechanical equipment. Rotor speeds are approximately S 10.1 rotations per minute (rpm) to 20.4 rpm for turbines rated at 1.5 MW. Rotor speeds for turbines rated at 2.5 MW range from 5.5 rpm to 16.5 rpm. Blade lengths are 38.5 meters for a 1.5 MW unit to 48.7 meters for a 2.5 MW unit.

4.2.3 Tower

The tower is a tubular steel structure tower with a hub height of between 80 and 100 meters (262 and 328 feet). The tower consists of three or four sections manufactured from steel plates rolled and welded to form a tubular structure. All welds are made in automatically controlled power welding machines and are ultrasonically inspected during manufacturing per American National Standards Institute specifications. Tower surfaces are sandblasted, coated for protection against corrosion, and painted with non-glare paint. Individual tower sections are delivered to the site and bolted together during the tower erection phase. Access to the turbine is through a secured steel door at the base of the tower. A service platform at the top of each section allows for access to the tower's connecting bolts for routine inspection. An internal ladder runs to the top platform of the tower just below the nacelle. A nacelle ladder extends from the machine bed to the tower top platform allowing nacelle access independent of its orientation. The tower is equipped with interior lighting and a safety guide cable alongside the ladder. The tower supports the nacelle, hub, and blades. The tower also houses electrical, control, and communication cables, and a control system located at the bottom of the tower. Towers may include lifts for use by wind plant personnel. Electrical equipment at the base of the tower conditions the generated electricity to match electric grid requirements.

4.2.4 Lightning Protection

The turbine is protected from lightning through a grounding and shielding system. A grounding system is installed during foundation installation work and is designed to be effective in local soil conditions. A low resistance path to ground is established with the grounding system that provides a safe path to earth for lightning strikes. Each of the turbine blades contain a copper wire that extends from the blade tips through the rotor and nacelle and down the tower to the buried ground grid. Lightning rods are attached to the anemometer and wind vane to offer additional protection to the turbine nacelle.

4.2.5 SCADA

Each turbine will be connected with underground fiber optic cable (the fiber optic cable is generally co-located with the underground electric cables) with all turbines connected through a fiber optic network. The fiber optic network is connected to a wind plant SCADA system located within the O&M building. Personal computers located within the O&M building and at WPL's generation control center will allow remote, 24-hour monitoring of the Project and each turbine on an individual basis. The SCADA system monitors a vast range of turbine components and gathers information to operate the turbines, including but not limited to generator output, bearing temperatures, FAA lighting, and coolant temperatures. Operational data that are gathered include but are not limited to wind speed, wind direction, temperature, and humidity, with such information sent onto the meteorological consultant for wind forecasting purposes. The SCADA system will also be linked to WPL's existing generating maintenance software system, allowing seamless maintenance planning and monitoring.

4.3 DESCRIPTION OF ELECTRICAL SYSTEM

A description of the electrical system is provided below.

4.3.1 Collector System

Low voltage (<1000 volts) electrical cables will extend from the turbine switchgear located inside the wind turbine tower at its base to a pad mount transformer located adjacent to the turbine foundation. The pad mount transformer will step up the voltage to 34.5 KV, necessary to minimize electrical losses as the electric power is transported to the Project substation. It is expected to utilize underground electric power cables to transmit all power from the turbines to the Project substation. The Project is expected to have upwards of approximately 70 miles of underground electric circuits. The underground cables will be installed in a trench that is at least 48 inches in depth. Most of the underground electric circuits will parallel existing turbine maintenance roads or public rights-of-way. However, some of these underground circuits will traverse private rights-of-way. The collector system underground cable layout will be completed in a manner that meets affected landowner requirements, minimizes impact to the environment, and achieves required economics.

The underground electric cable trench will be backfilled with native soil that is clean of rocks or other materials that may damage the cable. In certain cases, a clean backfill material such as lime screenings will be used as the first six to twelve inches of backfill material to achieve required backfill thermal conductivity or cable protection. In all cases, backfill material will be installed in a manner that mitigates trench backfill settling and potential washouts. The underground cable trench route will be restored to its prior use with areas being seeded and protected from erosion as necessary.

Above ground cable vaults measuring approximately 48 inches by 60 inches will be installed where underground cable circuits intersect. These vaults will be installed in a manner to minimize visual impact, avoid interference with intended land use, and ensure the public is protected. Where appropriate, bollards will be installed adjacent to these underground cable vaults in order to minimize damage by farm equipment or vehicles.

All underground cable circuits will terminate at the Project substation. Cable circuits will be installed underneath public rights-of-way in compliance with road permits received from appropriate public authorities.

4.3.2 Substation

The Project substation will be located within the Project Area (see Appendix A, Exhibit A-3 for preliminary location), and will be designed and constructed in accordance with utility standards for the state of Minnesota. The Project substation will step-up the voltage from 34.5 KV to 161 KV so that the electricity can be reliably interconnected to the surrounding power grid. The basic elements of the substation are a control house, transformer, circuit breakers, relaying equipment, high-voltage bus work, steel support structures, and overhead lightning suppression conductors. The substation equipment will be installed on concrete foundations. The substation

footprint will be approximately 400 feet x 500 feet. The substation surface will be graveled, enclosed with a chain link fence, and accessed through padlocked gates.

4.3.3 Radial Line

A new WPL-owned radial line will be required to interconnect the Project substation to the ITC transmission system. The new radial line will operate at a voltage of 161 KV. The line will be constructed using a narrow profile, monopole type design to minimize impacts on existing land uses and aesthetics. To the greatest extent possible, this new radial line will parallel existing public rights-of-way and will be designed and constructed in accordance with utility standards for the state of Minnesota. WPL expects to apply for a permit for the radial line in the third quarter of 2008.

4.4 PROJECT CONSTRUCTION

A summary of construction activities expected for the Project are as follows:

- Final turbine micro-siting.
- Final survey for access roads and collector system.
- Construction of laydown area for equipment and material storage and work trailer location.
- Construction of access roads.
- Improvements to local roads.
- Installation of collector system including electrical and communication cables.
- Installation of Project substation.
- Construction of radial line that will connect Project to the high voltage electric grid.
- Installation of tower foundations.
- Wind turbine tower erection.
- Setting of nacelle, rotor, and blades on the tower.
- Checkout, testing, and commissioning of Project.
- Restoration of site including removal of crane pads, excess access road width, and restoration of laydown area.

4.4.1 Foundation Design

A spread-type foundation is expected to be used to support the turbines. The spread-type foundation is an octagon shaped foundation with a 48-inch tall pedestal up to 16 feet in diameter located at the center of the foundation. This pedestal supports the turbine tower and extends approximately 18 inches above ground. The base of the spread-type foundation will be up to 80 feet in diameter and five to eight feet thick.

As part of turbine micro-siting, a geo-technical investigation will be completed at each proposed turbine location to clearly understand foundation requirements and to facilitate foundation engineering and design. Foundation engineering and design will be completed and certified by

outside registered engineering consultants with extensive experience in wind turbine foundation design.

Rebar and rebar cages are installed throughout the foundation. Anchor bolts are tied to the rebar and extend up through the foundation pedestal. The turbine tower is bolted to these anchor bolts. Approximately 500 cubic yards of concrete will be used for each foundation.

Foundation installation includes removal of native soil and prep of the foundation area, installation of reinforcing bar, pouring of the foundation concrete, and installation of the turbine ground grid which encircles the foundation. Top soil removed in the vicinity of the foundation is stockpiled and used to reclaim areas around the foundation. Subsoil, rock, and other debris that is removed will be profiled and disposed of at an approved site.

4.4.2 Turbine Safety

All turbines are designed with safety systems within the wind turbine and remotely through the SCADA system. A summary of key safety features for the Project is as follows:

(a) Interlocks: Turbines contain an interlock system that prevents ascent with the turbine in-service.

(b) Brakes: Three independent braking systems are utilized on turbines. Aerodynamic brakes utilize backup battery power or nitrogen accumulators that yaw the turbine blades out of the wind, bringing the rotor to a stop. The mechanical braking system utilizes disc brakes that are activated hydraulically upon loss of electric power. The mechanical braking system brings the wind turbine to a stop quickly. Finally, the wind turbine utilizes a parking brake that is applied automatically when O&M personnel ascend the turbine.

(c) Tower Climbing: Safety interlocks prevent tower climbing unless proper safety gear is employed, the wind turbine is shut down, and the wind turbine parking brake is engaged. Safety climbing gear and harnesses are required to climb the tower ladders.

(d) Tower Lifts: Safety interlocks prevent lifts from operating unless locks are engaged. Overspeed and overload detectors stop movement of the lift if speed or weight is in excess of ratings.

(e) Electrical Equipment: The Project substation is enclosed by a chain link fence meeting State and Federal regulations with all gates padlocked. Other outdoor electrical equipment is padlocked with doors requiring a special tool to open when padlocks are removed. Internal energized equipment is shielded by panels to avoid inadvertent contact with energized components of the electrical equipment.

(f) Access Roads: Access roads may be gated and padlocked if circumstances dictate a need to do so.

The entire Project will be designed to meet or exceed all federal, state, local, Occupational Safety and Health Administration, and other pertinent regulations.

4.4.3 Civil Works

Civil works consist of site work, access road, construction of crane pads upon which the erection cranes will rest, construction of laydown area(s) for large turbine components, construction of temporary turning radii on existing public roads, removal of excess access road width upon completion of turbine erection, and development of temporary crane paths from time to time. The civil works also include reclamation of the laydown area(s) and temporary turning radii to the original land use, or in accordance with local governing bodies. The laydown area will be approximately five acres in size, and will provide for temporary storage of construction equipment, turbine components, and electrical equipment, and will serve as the location for construction trailers and offices. Upon completion of construction, laydown area(s), temporary roads, and temporary crane paths will be reclaimed to their original use.

4.4.4 Commissioning

Once the turbines are erected, and after completion of electrical infrastructure work, electric wiring is installed and checked, and the turbine is pre-commissioned and prepared for final testing, checkout, and commissioning. The Project will go through a test and calibration phase with test energy being exported to the electrical system. At the end of the test phase, the Project is ready for commercial operation.

4.5 PROJECT CONTROL, OPERATION, AND MAINTENANCE

WPL will own, operate, and maintain the Project. The turbine vendor will maintain the turbines under a services agreement for a minimum of two (2) years, which coincides with the warranty period.

The Project will be monitored remotely through WPL's Energy Management System. This will provide 24-hour control and observation of the Project, including economic dispatch.

Each wind turbine in the Project will communicate directly with the SCADA system for the purposes of performance monitoring, predictive maintenance, and energy reporting. The SCADA system also provides for overall control of the wind farm. WPL will require its contractors to provide a one-year warranty on their work. Turbine suppliers are providing extended warranties, which WPL will take advantage of to the extent is it prudent to do so. WPL will request the turbine supplier to provide a guarantee on wind turbine performance, output, and availability.

4.5.1 Operations And Maintenance Building

The O&M building will be similar in appearance, design and functionality to existing WPL operating facilities. WPL expects this facility will be 6,000 to 7,000 square feet in size, with an

outside fenced in area to store a small number of large components on a permanent or temporary basis. The O&M building will include three one-ton truck bays, office space, a parts storage area, and a work area. The O&M building will house trucks, tools, spare parts, SCADA control equipment, maintenance fluids and material, and Project records and manuals. To the extent possible, the O&M building will be located within an incorporated area that offers water and sewer service, provided the incorporated area is within or adjacent to the Project Area. WPL will also consider access to high speed communications when locating the O&M building.

4.6 PROJECT SCHEDULE

Please see Appendix D for a GANT chart of the proposed construction schedule of the first 200 MW phase.

4.6.1 Land Acquisition

The Developer will be responsible for all land acquisition and will obtain the necessary land use rights from landowners. The Project Area will be located on land currently utilized for agricultural purposes such as cropping or pasture. The Project Area was initially selected based upon favorable wind conditions.

WPL is currently undertaking and completing extensive analyses regarding land use, including but not limited to environmental factors, land owner acceptance, and constructability. WPL will evaluate land use and will contact local governments to involve them in the process. All regulations and requirements applicable to the selected site will be satisfied. WPL currently has first right to construct turbines and other infrastructure on specific properties within the Project Area.

WPL will select the wind turbine, plan necessary access roads, and determine appropriate collection system cabling routes. WPL will offer long term Easement Agreements to designated landowners. Annual acreage payments will be paid for properties that will require access roads and underground electric lines. WPL will also make annual turbine payments on a per MW of nameplate capacity basis. Transmission easements will be separate from the Easement Agreements. WPL will acquire outright any properties upon which it plans to locate the Project substation and the O&M building. Typically, the total acreage of such properties ranges from 5 to 10 acres.

WPL will complete an extensive environmental analysis. See Section 5 for detail.

4.6.2 Permits

WPL will be responsible for undertaking all required environmental review and will obtain all permits and licenses that are required following issuance of the LWECS site permit. All regulations and requirements applicable to the selected site will be evaluated and understood to ensure the wind generating plant will conform. Section 6 identifies potential permits for construction and operation of the Project.

4.6.3 Equipment Procurement, Manufacture and Delivery

The majority of the global wind turbine manufacturing capacity is booked in the near-term. Therefore, wind turbine suppliers are reticent to accept "spot market" purchase agreements, opting instead for longer-term supply agreements. Subsequently, WPL is negotiating long-term turbine supply agreements that will reduce price volatility, provide certainty in delivery, and reserve production capacity sufficient to meet our strategic planning needs for wind construction.

4.6.4 Construction

WPL personnel will manage prime construction contractors regarding roads, turbine assembly, electrical, and communications. The construction will take approximately nine (9) months to complete.

4.6.5 Construction Financing

WPL will be responsible for financing all pre-development, development, and construction activities. WPL expects financing through internal funds.

4.6.6 Permanent Financing

Permanent financing will be provided with WPL's internal funds. WPL will retain the ownership interest in this Project.

4.6.7 Expected Commercial Operation Date

WPL expects that the first 200 MW of the Project will begin commercial operation in the fourth calendar quarter of 2010. The commercial operation date is dependent on the completion of the interconnection, permitting, and other development activities.

4.7 DECOMMISSIONING TRIGGERS AND RELATED ACTIVITIES

The Project decommissioning and restoration plan is in accordance with the requirements of Minn. Rule 7836.0500, subp 13. WPL expects that the life of the Project will be no less than 25 years, and reserves the right to re-apply for a LWECS site permit and continue operation of the Project upon expiration of the original LWECS site permit.

4.7.1 Decommissioning And Restoration

Decommissioning will be triggered by the expiration of the Easement Agreement between landowners and WPL, or if the Project ceases to operate. WPL reserves the right to re-apply for a LWECS site permit and continue operation of the Project. LWECS site permit renewal may be under a new long-term power purchase agreement (PPA), merchant operation of the Project, or replacement and re-powering of the Project.

An Easement Agreement can terminate upon: (a) the expiration of the easement term; (b) written agreement of the parties; (c) an uncured material breach; or (d) WPL's abandonment. Abandonment is defined as the facility ceasing to operate for a period of twenty-four consecutive months, unless the lack of operation is due to an event of Force Majeure.

WPL will begin decommissioning the Project within 24 months from the time the Project ceases to operate. Decommissioning will be completed within 18 months from the time decommissioning commences.

The first step in decommissioning will be dismantling all turbines, towers, pad-mounted transformers, substations, and related above-ground equipment. Turbine towers, nacelles, pad-mounted transformers, and substation equipment will have considerable value and will be removed and sold. Unsalvageable material will be disposed of at authorized sites.

Subsequent steps in decommissioning will be the removal of concrete turbine pads and any other underground facilities to the greater of (i) three feet below the soil surface or (ii) the depth required by the Easement Agreement.
The final step in decommissioning will be removal of Project roads. Decommissioned roads will be reclaimed to restore the surface grade and soil to a condition suitable for agriculture. If a landowner desires, roads will be left in place.

Decommissioning will be conducted in order to allow agricultural use of the area after decommissioning. Reclamation procedures will be based on site-specific requirements and techniques commonly employed at the time the area is to be reclaimed, and will include re-grading to restore soil and original contours.

4.7.2 List Of Decommissioning Activities

A summary of decommissioning activities and tasks is as follows:

(a) The wind turbine, blades, and tower will be removed in a manner to allow for refurbishment and resale of each component. Removal will require construction of temporary crane pads, plus some access road improvements to accommodate large cranes and trucks.

(b) The wind turbine foundation will be removed to a depth of three feet below the surface, or as otherwise set out in the Easement Agreements. The foundation pit will be backfilled, covered with four inches of black dirt, and seeded.

(c) The transformer will be removed from the site and refurbished. The transformer pad and/or support structure will be removed and disposed of. All cables and conduits will be removed to a depth of three feet below the surface, or as otherwise set out in the Easement Agreements. The area will be backfilled, covered with four inches of black dirt, and seeded.

(d) The met tower structure will be removed, refurbished, and sold. The met tower foundation will be removed to a depth of three feet below the surface, or as otherwise set out in the Easement Agreements. The area will be backfilled, covered with four inches of black dirt, and seeded.

(e) The underground cable circuits are expecteded to be buried at a depth of 48 inches. All cable at this depth or approximately at this depth will be abandoned as-is. All above-ground structures associated with the underground cable system such as cabinets and signs will be removed and scrapped. Underground cables at the cabinets will be cut off at a depth of three feet. All disturbed areas will be backfilled, covered with four inches of black dirt, and seeded.

(f) The roads that local land owners desire to be left as is will be titled to such landowners. All other roads will be removed, with the road areas restored in a manner consistent with current uses. Disturbed areas will be leveled, de-compacted, and seeded.

(g) The electrical substation will be removed in its entirety. Foundations will be removed to a depth of three feet below the surface. Equipment will be removed, refurbished, and resold. Fencing will be removed and scrapped. Conduits will be dug up, removed, and scrapped. Substation steel structures will be removed and salvaged. Substation control building will be removed, refurbished, and resold. The entire area will be leveled to native contours, covered with four inches of black dirt, and seeded.

(h) The overhead transmission conductors will be removed and sold as salvage. Pole insulators will be removed and scrapped. All metal hardware will be removed and sold as salvage. Poles will be removed and sold for reuse. Pole holes will be backfilled and the surface area seeded. Pole anchors will be cut off four feet below the surface.

All equipment located within the O&M building that is directly associated with the Project will be removed and salvaged. Remaining equipment such as cranes and hoists will remain within the O&M building, and sold with the building as part of a real estate sale.

5.0 ENVIRONMENTAL ANALYSIS

This section provides a description of those environmental analyses and activities which will be performed to permit the Project. Conditions that exist within the Project Area have been detailed as available. Specific state environmental standards, if applicable, are described along with the method and timeline for complying with the standard. Consistent with MPUC procedures on siting LWECS and applicable portions of the Power Plant Siting Act, various exclusion and avoidance criteria were considered in the selection of the Project Area.

5.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The Project is located in Freeborn County in an area dominated by tilled agriculture and gently rolling hills. The landscape in the Project Area is relatively flat, with general elevations ranging from approximately 1,250 to 1,320 feet above mean sea level.

5.2 DEMOGRAPHICS

5.2.1 Description Of Resources

The Project is located within a lightly populated rural area in southern Minnesota. Information on demographics and housing for this section was taken from the U.S. Census Bureau.

The Project Area is located in Freeborn County. The 2000 population of Freeborn County was 32,584, and the estimated 2006 population was 31,636. The Project is located in Hartland, Manchester, Bath, and Bancroft townships. The average household size in the year 2000 in Freeborn County was 2.4. The total number of county housing units in the year 2005 was 14,182.

The 2004 median household income for Freeborn County was $39,865. Approximately 8.7% of the county population lived below the poverty level in 2004. Additional population and economic characteristics for individual townships in the Project Area are provided in Table 5.2.1 below.

Table 5.2.1 Township Population and Economic Characteristics

	Township Statistics for the 2000 Census			
Parameter	**Hartland**	**Bath**	**Manchester**	**Bancroft**
Average household size	2.66	2.66	2.78	2.68
Total housing units	120	186	174	404
Median household income	$38,125	$34,773	$48,281	$47,102
Population % below poverty level	9.5	3.5	4.0	2.5

5.2.2 Impacts

Short-term impacts to socioeconomic resources will be relatively minor. Roughly 106 to 170 acres of agricultural land will be permanently removed from production. Landowner compensation will be established by Easement Agreements, and the areas surrounding each turbine may still be farmed. Project construction will not cause additional impacts to leading industries within the Project Area. There is no indication that any minority or low-income population is concentrated in any one area of the Project Area, or that the turbines will be placed in an area occupied primarily by any minority group.

Local contractors and suppliers may be used for portions of the construction work. Total wages and salaries paid to contractors and workers in Freeborn County will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and state by circulation and recirculation of dollars paid out by WPL for business expenditures and for state and local taxes. Expenditures made for equipment, fuel, operating

supplies, and other products and services benefit businesses in the county and the state. Landowners having turbine or other Project facilities on their land will receive an annual easement payment for the life of the Project. This payment diversifies and strengthens the local economy as discussed below.

Long-term beneficial impacts to the county's tax base as a result of the construction and operation of the Project will contribute to improving the local economy in this area of Minnesota. The development of wind energy in southwestern Minnesota is a good example of how the economic base has been diversified and strengthened. Northwest Economic Associates prepared a report, "Assessing the Economic Development Impacts of Wind Power," that included a case study of the Lake Benton I Wind Project in Lincoln County, Minnesota. In addition to the creation of jobs and personal income, the Project will pay a Wind Energy Production Tax to the local units of government of $0.0012 per kilowatt-hour of electricity produced, resulting in an annual Wind Energy Production tax ranging from approximately $350,000 to $450,000.

5.2.3 Mitigation Measures

Socioeconomic impacts associated with the Project will be primarily positive with an influx of wages and expenditures made at local businesses during Project construction and an increase in the county's tax bases from the construction and operation of the turbines.

WPL will propose minimum setbacks for turbines from occupied residences. These setback distances will be dependent on the turbine power output in MW and are expected to comply with Minnesota noise standards. WPL also proposes a minimum setback of 250 feet from public roads. By adopting minimum setbacks, little if any impact to existing agricultural businesses and the region's socioeconomic status will occur.

5.3 NOISE

5.3.1 Description Of Resources

Background noise levels in the Project Area are typical of those in rural settings, where existing nighttime noise levels are commonly in the low to mid-30 dBA. The dBA scale represents A-weighted decibels based on the range of human hearing. Low to mid-30 dBA are relatively low background levels and are generally representative of the site. Higher levels exist near roads and other areas of human activity. The windy conditions in this region tend to increase ambient noise levels compared to other rural areas.

The Developer performed an assessment of noise levels at residences (i.e. receivers) across the Project Area (*See* Appendix A, Exhibit A-4). Noise levels were calculated using the Windfarmer program and a representative wind turbine for the site. The program assumes all turbines in the Project Area are operating simultaneously and wind speeds of 8 m/s are occurring. 8 m/s represents the wind speed when maximum noise levels are expected.

Noise levels predicted by Windfarmer were compared to the Minnesota Pollution Control Agency (MPCA) Daytime and Nighttime L10 and L50 Limits as stated in the Minn. Rule

7030.0040. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance, and hearing conservation requirements for receivers within areas grouped according to land activities by the Noise Area Classification (NAC) system established in the Minn. Rule 7030.0050. The NAC-1 was chosen for receivers in the Project Area since this classification includes farm houses as household units. Daytime and nighttime limits for this classification are (1) L50 limit of 60 dBA and L10 limit of 65 dBA in daytime, and (2) L50 limit of 50 dBA and L10 limit of 55 dBA at nighttime. The nighttime L50 limit of 50 dBA is the most stringent limit.

5.3.2 Impacts

When in motion, turbines emit a perceptible sound. The level of this noise varies with the speed of the turbine and the distance of the listener from the turbine. On relatively windy days, the turbines create more noise; however, the ambient or natural wind noise level tends to override the turbine noise as distance from the turbine increases.

The Windfarmer program predicted noise levels ranging from 24.5 dBA to 53.3 dBA. Only one receiver at a distance of 80 meters to the south of a proposed turbine indicated a noise level in excess of 50 dBA. Therefore, the proposed wind turbine causing this potentially higher noise level has been removed from the initial turbine array to avoid noise levels above 50 dBA.

Using the receiver which reported the highest predicted noise level from the Windfarmer analysis, values of L10 (level met or exceeded 10% of the time) and L50 (level met or exceeded 50% of the time) were determined to be the following: (a) L10: 47.25 dBA; and (b) L50: 46.79 dBA.

Since the noise level for the representative wind turbine used for this analysis reaches a maximum at 8 m/s and the wind is stronger than 8 m/s more than 10% of the time, the predicted L10 noise level is the same as the predicted maximum noise level, and the predicted L50 is just slightly below the predicted maximum.

5.3.3 Mitigation Measures

Impacts to nearby residents and other potentially affected parties in terms of noise will be taken into consideration as part of the turbine micrositing. WPL proposes minimum setbacks for turbines from occupied residences dependent on the turbine specification. These setback distances will be used to avoid exceeding 50 dBA at occupied residences. To the extent that the sound characteristics of the selected turbine vary, WPL will ensure compliance with MPCA noise standards.

5.4 VISUAL IMPACTS

5.4.1 Description Of Resources

The topography of the Project Area is relatively flat with gently rolling hills and ridges with elevations that range from approximately 1,250 to 1,320 feet above sea level. Agricultural fields, farmsteads, fallow fields, large open vistas, and gently rolling topography visually dominate the Project Area. The landscape can be classified as rural open space.

Within the Project Area, local vegetation is predominantly agricultural crops and pasture. Crops include corn, soybeans, small grains, and forage crops, which visually create a low uniform cover. A mix of deciduous and coniferous trees planted for windbreaks typically surrounds farmsteads. Generally, these forested areas are isolated groves or windrows established by the landowners/farmers to prevent wind erosion and shelter dwellings. In the swales, there are occasional patches of native willows, cattails, sedges, and rushes.

Within the Project Area, the trend is toward fewer and larger farms. Some farms participate in the Conservation Reserve Program (CRP) and the Reinvest in Minnesota (RIM) program. CRP and RIM lands are croplands planted with conservation grasses and legumes to protect and improve the soil, and cannot be harvested or pastured. CRP lands are enrolled for 10-year periods, whereas RIM easements are permanent conservation easements.

The settlements in Freeborn County are residences and farm buildings scattered along the rural county roads. These structures are focal points in the dominant open space character of the vicinity. A number of the farm structures date back to the late 19th or early 20th centuries, and are representative of that era of Minnesota farm architecture. Typically, the farmsteads and residences are located at lower elevations to avoid winds common to the area.

5.4.2 Impacts

Turbines will affect the visual character of the landscape within the Project Area. However, discussion of the aesthetics of the Project is based on subjective human responses. For some viewers, the Project could be perceived as a visual intrusion, characterized as “industrial” metal structures, 230 to 262 feet high at hub height for the range of turbines considered, intruding on the natural aesthetic value of the landscape. Wind farms have their own aesthetic quality and appeal. For other viewers, operation of the wind farm will not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Project Area will retain the rural sense and remote character. Also, although “industrial” in form and purpose, turbines are essentially “farming” the wind for energy.

The proposed land use would not involve any ongoing industrial use of non-renewable resources or emissions into the environment. Although the turbines are high-tech in appearance, they are compatible with the rural, agricultural heritage and the other existing turbines in the area.

Essentially, the installation of the Project will alter the land use and visual quality of the site. The topography in the vicinity is generally flat and the vegetation cover is uniformly low,

making the ridgelines of the landform in the vicinity highly vulnerable to visual disruptions. The Project will alter the landscape in the area from agricultural to wind farm/agricultural.

The FAA requires obstruction lighting or marking of structures over 200 feet above ground surface because they are considered obstructions to air navigation. The FAA recently released guidance (U.S. Department of Transportation FAA Advisory Circular 70/7460-1K Chg2 dated 02/01/07) on standards for obstruction marking and lighting that should be applied to the proposed turbine structures at the Project based on their expected heights. WPL will use this guidance when applying to the FAA for approval of a lighting plan that will light the Project as one large obstruction, versus every structure over 200 feet in height. This will potentially reduce the number of lights on turbines in the Project, compared with what the FAA has required in the past. WPL will follow the approved plan to meet the minimum requirements of FAA regulations for obstruction lighting of turbines. It is WPL's intent to include details of its lighting plan at the time Form 7460-1 is submitted to the FAA for final approval on turbine construction

Installation of turbines may produce "shadow flicker" which is the occurrence of periodic changes in light intensity due to the shadow of a turbine blade passing over a point of interest. Shadow flicker usually occurs in the morning and evening hours when the sun is low in the horizon and the shadows are elongated.

Shadow flicker generally is not noticeable beyond approximately 10 RD from a turbine. Therefore, using available specifications from the turbine manufacturers and the most updated site layout, occupied residences within this potential zone of impact will be identified. If no residences are affected, further assessment will not be performed. If residences within the zone of impact are identified, alternate turbine locations will be considered as a mitigation measure.

Since the field work identified for other environmental impacts may affect the turbine array presented in this application, the initial shadow flicker assessment will not be completed until turbine locations become more definitive. However this initial assessment will be completed prior to turbine micrositing to ensure that turbines are not moved into final locations that can produce significant shadow flicker effects.

It has been noted that the presence of turbines within the view shed of Wildlife Management Areas (WMA) or other natural areas may diminish the natural quality of those areas and the experience of the persons utilizing those areas. While it may be true to some extent that the ability to see turbines in the background intrudes upon the purity of that experience, the same could be said of any human habitation or activity in the vicinity, and the presence of turbines may be less intrusive than many such activities. Nonetheless, some WMA users may perceive the Project to have negative effects.

Visual differences are possible depending on the number of turbines needed in the Project Area. The visual impact on the landscape will be reduced by 50% if the Project is built using 3.0 MW versus 1.5 MW turbines.

5.4.3 Mitigation Measures

The following are proposed mitigation measures:

(a) Turbines will be uniform in color;

(b) Turbines will not be located in biologically sensitive areas such as parks, WMAs, or wetlands;

(c) Turbines will be illuminated to meet the minimum requirements of FAA regulations for obstruction lighting of wind turbine farms;

(d) Existing roads will be used for construction and maintenance where possible to minimize the amount of new roads constructed; and

(e) Access roads created for the Project will be located on gentle grades to minimize erosion, visible cuts and fills.

To attain maximum efficiency, wind power technology requires as much exposure to the wind as possible. As a result, the turbines are located on the hilltops in the area, which makes them highly visible to a wide range of surrounding areas. Shorter towers or placement of the turbines at alternate locations off the ridgelines are not feasible as visual mitigation measures because these measures would result in less efficiency per unit and adversely impact the economic viability of the Project.

5.5 PUBLIC SERVICES AND INFRASTRUCTURE

5.5.1 Description of Resources

The Project is located in a lightly populated, rural area in southern Minnesota. There is an established transportation and utility network that provides access and necessary services to the light industry, small cities, homesteads, and farms existing near the Project Area. The closest towns to the Project Area are the Cities of Hartland, located on the northwest boundary of the Project Area and Manchester, located on the southern boundary. Sanitary sewer, water, cable television, telephone, and library services are either provided by these cities or larger neighboring communities. Additionally, emergency services include the Freeborn County Sheriff, Naeve Ambulance Service, New Richland Ambulance Service, Hartland 1st Responder, and Fire Department. The townships have limited public infrastructure services. Homes typically utilize septic systems for their household needs.

In general, the existing roadway infrastructure in and around the Project Area is characterized by county and township roads that generally follow section lines. Various County State-Aid Highways, County Roads, and township roads provide access to the Project Area. Access to the Project Area also includes two-lane paved and gravel roads. In the agricultural areas, many landowners use private single-lane farm roads and driveways on their property.

The primary transportation arteries through the Project Area include State Highway 13 which runs north-south from the western portion of the Project Area through the south central portion. Interstate 35 is located approximately 15 miles east of Hartland. County Roads 25, 29, and 35 also traverse the Project Area. 2006 traffic volumes along Highway 13 in the vicinity of Hartland have been estimated at 2,500 for average annual daily traffic and 270 for heavy commercial daily traffic. The only active railroad line crossing through the western portion of the Project Area is the Chicago and Northwestern Rail Line.

Major utilities servicing the region include Xcel Energy and Centerpoint Energy (Minnegasco). Telephone service is provided to the homes and businesses in the area by the Manchester-Hartland Telephone Company, Sprint, and Hickory Tech.

The Minnesota Department of Transportation (MDOT) is upgrading the 911 system throughout the state of Minnesota and has been addressing wind projects that are in development as they try to erect or add new microwave equipment to new and/or existing towers. The MDOT finished its siting and permitting of Freeborn County in the past several months. Because the Fresnel analysis conducted for this Project Area has occurred recently, microwave equipment identified in the initial search should reflect any changes made by MDOT.

Using industry practices and Federal Communications Commission (FCC) databases, a search was conducted to determine the presence of existing radio frequency facilities within or adjacent to the Project Area. The search focused on land mobile facilities; undocumented towers, and broadcast TV and radio facilities.

5.5.1.1 Land Mobile Facilities

There are 266 land mobile transmitters located in and near the Project Area. Structures, such as wind turbines, that reflect radio frequency waves that are within the near-field region of the land mobile antenna can cause disruption to the land mobile station. Therefore, those transmitters located in the Project Area or that were less than 0.25 miles from the area boundary underwent further analysis. The analysis consisted of defining an exclusion zone radius, within which a wind turbine should not be placed. The radius was calculated using antenna dimensions and wavelengths at the land mobile station frequency. The analysis indicated that Turbine 18 was inside one exclusion zone (1100 feet) and Turbines 166 and 167 come close to another exclusion zone (1000 feet).

5.5.1.2 Undocumented Towers

There are 6 undocumented towers located in and near the Project Area. Two of these are meteorological towers and are not a concern. Another two are located outside the Project Area at distances of approximately 0.5 and 2.5 miles and are not expected to have an impact. The remaining two towers are inside the Project Area. One tower (Tower No. 1) has 5 microwave antennas and cellular and/or personal communication service antennas at the top. The other tower (Tower No. 2) appears to be used for microwave only. However, a construction permit for a digital Low Power TV facility has specified this tower as its antenna location. Turbines 243 and 244 were inside the exclusion zone defined for Tower No. 1 (1200 feet).

5.5.1.3 Broadcast TV Facilities

Freeborn County, where the Project Area is located, is in the Rochester, MN-Mason City, IA-Austin, MN designated market area according to Nielsen Media Research. Inside this designated market area, there are 7 analog and 7 digital TV stations that have been identified as placing a receivable signal in and around the Project Area. The TV affiliates identified in each group of stations are PBS, ABC, NBC, CBS, and FOX. There are also 3 analog and 3 digital TV translators and Low Power TV stations that are predicted to serve at least a portion of the Project Area.

5.5.1.4 Radio Facilities

A search of the FCC database indicated that 16 full-service FM stations each place a predicted primary signal over at least a portion of the Project Area. It should be noted that FCC rules do not require FM stations to be notified of the construction of a wind farm in their service areas. No AM broadcast antennas were identified within the required notification distance of 3 kilometers beyond the nearest turbine. The nearest AM station is in Albert Lea, whose antenna is 17 kilometers from the center of the turbine area.

5.5.2 Impacts

The Project is expected to have a minimal effect on the existing infrastructure. The following is a brief description of the impacts that may occur during the construction and operation of the Project:

(a) Electrical Service: Construction of the Project will add wind turbines, a pad-mounted transformer at the base of each turbine, an underground and aboveground electrical collection system, and an occasional aboveground junction box that will deliver power to the substation. The power will then be transmitted to a substation, located at the electrical center of the Project, and from there it will enter the grid.

(b) Roads: Constructing the Project will require gravel access roads, with final road lengths depending on the size of turbine selected and final design. In addition, during operation of the Project, the access roads will be used by O&M crews while inspecting and servicing the turbines. The access roads will be between towers, and one road will be required for each string. The roads will be approximately 16-feet wide and low profile to allow cross-travel by farm equipment. WPL will work closely with the landowners to locate these access roads to minimize land-use disruptions. Construction traffic will use the existing county and state roadway system to access the Project Area and deliver construction materials and personnel. During the peak of construction, it is expected that there will be an additional 275 vehicle trips per day. Because the current traffic levels on the roadways in the Project Area are well below roadway capacities, construction traffic will be perceptible but similar to seasonal

variations in traffic, such as autumn harvest. Construction is not expected to result in adverse traffic impacts. O&M activities will not noticeably increase traffic in the Project Area.

(c) Railroads: The Project will not affect activity on the Chicago and Northwestern Rail Line, which crosses the Project Area.

(d) Water Supply: Construction and operation of the Project will not significantly impact the water supply. No installation or abandonment of any wells is expected for the Project. However, in the event wells are abandoned, they will be capped as required by Minnesota law. The Project will not require the appropriation of surface water or permanent dewatering. Temporary dewatering may be required during construction for specific turbine foundations and/or electrical trenches. A water supply will be necessary for the O&M building. Water usage during the operating period will be similar to household volume, or less then 5 gallons per minute. Water use during construction will occur at a higher rate to provide dust control and water for concrete mixes. WPL will coordinate with the appropriate water supplier(s) to avoid their water lines in the Project Area during construction.

(e) Telephone: Construction and operation of the Project will not impact the telephone service to the Project Area. Gopher One Call will be contacted prior to construction to locate and avoid all underground facilities. To the extent Project facilities cross or otherwise affect existing telephone lines or equipment, WPL will enter into agreements with service providers to avoid interference with their facilities.

(f) FCC Registered Towers: WPL has conducted a Fresnel microwave beam path analysis of the Project Area. WPL will not operate the Project so as to cause microwave, radio, telephone, or navigation interference contrary to FCC regulations or other law. In the event the Project or its operation causes such interference, WPL will take the steps necessary to correct the problem.

5.5.2.1 Land Mobile Facilities

Unless the existing service signals of land mobile facilities are already marginal because of insufficient power or antenna ground clearance, service disruption by the three identified turbines (Nos. 18, 166, 167) should not be significant if the exclusion zone distances discussed earlier are implemented during tower siting. Therefore, it is recommended that these turbines be moved from their preliminary locations to obtain the required near-field clearance.

5.5.2.2 Undocumented Towers

One undocumented tower might create a microwave impact zone in the area of two turbines (Nos. 243, 244). Similar to the land mobile facilities, if these turbines are placed outside the

exclusion zone, impacts should be minimal. Therefore, it is recommended that these turbines be moved from their preliminary locations to minimize impacts to the microwave signals.

5.5.2.3 Broadcast TV Facilities

Significant TV interference is not expected for the following reasons:

(a) There are no significant population centers (populations above 1000) within 5 kilometers downstream of any potential turbine interference to the Rochester, Mason City, and Austin TV stations.

(b) By the time the Project is operational, High Definition (HD) TV broadcasting will be fully phased in (and analog phased out), and receivers are better equipped to correct for minor multipath interference. Under the Digital Television Transition and Public Safety Act of 2005, Congress has mandated the hard shut off of all analog broadcast signals by February 18, 2009. 47 U.S.C. 309(j)(14)(A).

5.5.2.4 Radio Facilities

No significant impact is expected to the reception of AM or FM broadcast facilities. A few FM receive locations may experience signal fluctuations in time with the wind turbine blade rotors, but the receiver automatic gain control should be able to manage these variations. Occasionally, depending upon ground conditions, local AM receivers may experience slight signal changes due to local effects, but these anomalies are not recognized by FCC or industry standards as a harmful effect.

5.5.3 Mitigation Measures

Construction and operation of the Project will be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. WPL will not operate the Project so it causes television interference contrary to FCC regulations or other law. Due to the minor impacts expected on the existing infrastructure during the Project construction and operation, extensive mitigation measures are not expected. In the event of a TV interference problem after construction, WPL will work with affected residents to determine the cause of interference and, where necessary, reestablish acceptable reception in a timely fashion.

Specific mitigation measures for impacts to land mobile facilities include changes in transmission and receiving equipment and increasing antenna heights. TV interference can be minimized through satellite/cable installation and/or antenna relocation or upgrades.

5.6 CULTURAL AND ARCHAEOLOGICAL RESOURCES

5.6.1 Description Of Resources

An initial assessment of cultural resources in the Project Area has been performed. The sources of information used for this assessment were as follows:

(a) Database of National Register of Historic Places, maintained by the National Park Service (NPS).

(b) Historic and archaeological inventory review by the Minnesota State Historic Preservation Office (MSHPO).

The NPS database indicated eight listings for Freeborn County in the cities of Albert Lea, Clarks Grove, and Hayward. However the registered sites were not located in or near the Project Area.

The MSHPO review indicates that five structures of historic significance and six archaeological sites are present within the Project Area. The historical structures are located near the town of Manchester and also scattered across Bath, Hartland, and Manchester Townships. The archaeological sites are concentrated in Township 104N, Range 22W, Sections 23 and 24.

A Phase I Cultural Resource Review will be completed for the Project Area by the end of June 2008 to determine impacts to known historical and archaeological resources. This review will include a reconnaissance level field survey of selected areas to determine if there are any sites of historical/archaeological significance in areas of planned development.

5.6.2 Impacts

Impacts to the identified historical structures are not expected, as these areas will be excluded from site development. Archaeological sites could be impacted directly during construction activities if they fall within areas planned for turbines, cable trenching, access roads, and other parts of a wind energy facility. In addition, construction of turbines may impact view shed integrity from existing standing structures. A report documenting results from the Phase I review discussed above will identify known or potential impacts to cultural resources.

5.6.3 Mitigation Measures

If cultural resources are identified during the field survey in areas of proposed development, recommendations for site avoidance, impact minimization, or mitigation will be proposed. These recommendations will be coordinated with any concerns and suggestions provided by the state MSHPO.

If archaeological remains are encountered during construction activities, WPL will be notified immediately and construction will be delayed until appropriate mitigations are in place.

5.7 RECREATIONAL RESOURCES

5.7.1 Description Of Resources

Recreational opportunities in Freeborn County include hiking, biking, boating, fishing, camping, swimming, horseback riding, skiing, hunting, and nature viewing.

Minnesota WMAs are managed to provide wildlife habitat, improve wildlife production, and provide public hunting and trapping opportunities. These Minnesota Department of Natural Resources (MDNR) lands were acquired and developed primarily with hunting license fees. WMAs are closed to all-terrain vehicles and horses because of potential detrimental effects on wildlife habitat. WMAs located in or within five miles of the Project Area include:

- Manchester WMA – A portion of this WMA is located just inside the east-central boundary of the Project Area and is home to deer, small game, pheasants, waterfowl, turkey, and doves.

- Scientific and natural areas are designated to protect rare and endangered species habitat, unique plant communities, and significant geologic features that possess exceptional scientific or educational values. There are none of these areas located in or adjacent to the Project Area.

- U.S. Fish and Wildlife Service (USFWS) Waterfowl Protection Areas (WPAs) are managed to protect breeding, forage, shelter, and migratory habitat for waterfowl or wading birds, such as ducks, geese, herons, and egrets. WPAs provide opportunities for viewing wildlife and intact ecosystems. There are no WPAs located in or adjacent to the Project Area.

Additional natural resources in the vicinity of the Project include scattered small creeks and lakes that are used for recreational boating and fishing. There are no state parks, county parks, or snowmobile trails located in or near to the Project Area. There is a city park in the town of Hartland.

5.7.2 Impacts

The Project will avoid development in the Manchester WMA and public parks. In general, recreational impacts will be visual in nature affecting individuals using public land near the Project Area for recreation. See Section 5.4 for additional discussion of visual impacts and proposed mitigation measures. Visual impacts will be evident to visitors using the Manchester WMA. No significant impacts to recreational resources are expected.

5.7.3 Mitigation Measures

Project turbines and associated facilities will not be located within public parks or the Manchester WMA. The MDNR has requested a one-quarter mile setback around the WMA be established as a restricted area where Project development activities would not occur.

5.8 HUMAN HEALTH AND SAFETY

5.8.1 Description Of Resources

5.8.1.1 Air Traffic

The Albert Lea Municipal Airport is the closest airstrip to the Project Area. The closest turbine structure is 5 miles northwest of the airport. A new north-south runway is also being planned by the city of Albert Lea and is being taken into consideration. The Developer has worked closely with the local airport officials, the MDOT Office of Aviation, and the FAA to identify airspace of special concern such as safety corridors and low altitude airways used by instrument-rated pilots for point-to-point navigational purposes. The initial wind park layout has been modified, based on input from the local airport manager and his board, to eliminate potential negative impact to these areas. A tower lighting plan in accordance with FAA regulations will be incorporated into the design.

Air traffic may also be present near the Project Area for crop dusting of agricultural fields. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. At this time, it is not expected that overhead collection lines will be used. The installation of wind turbine towers in active croplands will create a potential for collisions with crop-dusting aircraft. However, the turbines themselves would be visible from a distance and lit according to the 2007 revised FAA guidelines.

5.8.1.2 Electromagnetic Fields

The term Electromagnetic Field (EMF) refers to electric and magnetic fields that are present around an electrical device. Electric fields arise from the voltage applied and magnetic fields arise from the flow of electrical current. Typical sources of EMF are power lines, house wiring, and electrical appliances. The intensity of the electric field is related to the applied voltage of the line. That is, the electric field intensity increases as the applied voltage increases. The intensity of the magnetic field is a function of the level of current flow through a conductor. Again, the magnetic field intensity increases as the current flow increases. Electric fields are present whenever the conductor, appliance, equipment, or house wiring is energized, even if these items are not being used. In contrast, magnetic fields exist only when current flows. Thus the item must be in use for the magnetic field to occur.

There are five sources of EMF associated with a wind plant. These are: (a) wind turbine generator; (b) electric transformer; (c) collector system; (d) substation; and (e) radial line.

Most of the electrical equipment associated with the turbine generator is located approximately 280 feet above ground in the nacelle. At this height, EMF from this equipment is negligible. Test results from existing wind plants have shown EMF generated by a turbine at a point ten feet from the turbine is less than EMF associated with a common household hair dryer. EMF at a distance of 25 feet and greater from a turbine can be expected to be non-discernable.

The turbine electric transformer will be located adjacent to the wind turbine. Again, test results from existing wind plants have shown EMF generated by a turbine transformer at a point ten feet from the wind turbine transformer is less than EMF associated with a common household hair dryer. EMF at a distance of 25 feet and greater from a turbine transformer can be expected to be non-discernable.

The collector system is similar to many underground buried electric power lines being used throughout the area. While the applied voltage is higher and corresponding electric fields are higher, these electric fields will be well below discernable levels. Buried electric cable systems, such as those generally used for wind plants, generate lower magnetic fields than overhead power lines due to the cancelling effect of their design. As such, the EMF from a collector system will be extremely low, and far below those values that are typically measured in a residence.

The substation will be similar in design and identical in its application to other substations prevalent throughout the State of Minnesota. A chain link fence will be utilized to keep the general public from direct proximity to the energized equipment. EMF levels within the substation are small.

The radial line will be similar or identical in nature to the transmission lines currently operating throughout the State of Minnesota.

5.8.1.3 Security

The Project Area is located in an area that has a low population density. Construction and operation of the Project will have minimal impacts on the security and safety of the general public.

Safety and security of the general public can be compromised if the turbine tips or blows over, if ice throw occurs, or if a blade falls off. A turbine may blow over due to a local earthquake or an extremely high wind. This Project is located in an area with extremely low earthquake potential. Turbines at existing wind plants have been in the direct path of tornados and have survived. The turbines will pose little or minimal physical threat to the security and safety of the general public, as they will be located greater than 250 feet from local roads and a minimum of 500 feet from residences.

Coating of the turbine blades with ice during an icing event may occur. However, the turbines contain security devices to measure icing and remove the wind turbine from service should an icing event occur. As such, the danger to the general public of ice throw from a turbine blade will be mitigated.

The Project Area will be secure during construction and operation. Warning signs, fencing, temporary fencing, internal security personnel, safety meetings, locks, traffic management plans, and contractor/facility personnel will all be used to ensure that the general public is safe and secure. Where necessary, access roads will be gated and locked. Local emergency management agencies will be contacted and training sessions held.

5.8.1.4 Road Traffic

The existing traffic levels are discussed in Section 5.5.1

5.8.2 Impacts

5.8.2.1 Air Traffic

The Developer has worked with the City of Albert Lea, Albert Lea Municipal Airport and the FAA to identify and address any potential air hazards that may be created by the Project. Information pertaining to safety corridors and low altitude airways have been incorporated into the Project Area plans to avoid conflicts between proposed wind turbine sites and air traffic.

The Developer has made trial filings with the FAA for sample turbine locations on the periphery of the Project Area. These filings resulted in the issuance of a "No Hazard Determination" by the FAA for this Project. Appendix E, Exhibit E-2, provides additional information on the FAA filings for the Project. WPL will notify local airports about the Project and new towers in the area to reduce the risk to crop dusters.

5.8.2.2 Electromagnetic Fields

While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. The scientific community has not been able to show any discernible health impacts from power lines. Based on the most current research on EMFs, the distance between any turbines or collector lines and houses, equipment design and direct proximity to energized equipment, the Project will have no impact to public health and safety due to EMF.

5.8.2.3 Security

Project construction and operation will have no significant impact to security and safety of the local residents. In some past wind farm projects, turbines have posed hazards to human safety from tower collapse and blade throw, typically as a result of seismic events. The Project Area is within a region considered to have low seismic activity (USGS, 2002 and 2007). Furthermore, modern turbine technology, in addition to proactive maintenance and inspections, has reduced these risks to insignificant rates. No safety issues have been reported in other wind projects in Minnesota. Therefore, safety issues including blade throw are not considered likely for the Project.

5.8.2.4 Road Traffic

Impacts to existing traffic levels are discussed in Section 5.5.2

5.8.3 Mitigation Measures

5.8.3.1 Air Traffic

The tower lighting plan will meet FAA requirements and will describe the type and frequency of turbine lighting which will be included in the Project Area. WPL will notify local airports about

the Project and new towers in the area to reduce the risk to crop dusters. Two (2) permanent meteorological towers will be free-standing with no guy wires.

5.8.3.2 Electromagnetic Fields

No impacts due to EMFs are expected and no mitigation is necessary.

5.8.3.3 Security

The following security measures will be taken to reduce the chance of physical and property damage, as well as personal injury, at the Project:

(a) The towers will be placed a minimum of 250 feet from public roads and a minimum of 500 feet from occupied homesteads. These distances are considered to be safe based on developer experience, and are consistent with prior LWECS site permits;

(b) Security measures will be taken during the construction and operation of the Project including temporary (safety) and permanent fencing, warning signs, and locks on equipment and wind power facilities;

(c) Regular maintenance and inspections will address potential blade failures, minimizing the potential for blade throw;

(d) Turbines will sit on solid steel enclosed tubular towers in which all electrical equipment will be located, except for the pad-mounted transformer. Access to the tower is only through a solid steel door that will be locked when not in use;

(e) Permanent meteorological towers will be free-standing; and

(f) Where necessary or requested by landowners, WPL will construct gates or fences.

5.8.3.4 Traffic

No impacts to traffic are expected. Therefore, no mitigation will be necessary. During peak construction periods, it is expected that existing speed restrictions and the physical dimensions of transport vehicles will limit the potential for significant dust to be generated and dispersed.

5.9 HAZARDOUS MATERIALS

5.9.1 Description Of Resources

The land within the Project Area is primarily rural and used for agriculture. Potential hazardous materials within the Project Area would be associated with agricultural activities, and include petroleum products (fuel and lubricants), pesticides, and herbicides. Older farmsteads may also

have lead-based paint, asbestos shingles, and polychlorinated biphenyls in transformers. Trash and farm equipment dumps are common in rural settings.

A Phase I Environmental Site Assessment has been conducted in the Project Area and has not identified recognized or historic environmental conditions. De minimis findings in the Project Area will not have an impact on site development activities.

Three types of petroleum products are necessary for the operation of the turbines, and include synthetic gear box oil, hydraulic fluid, and gear grease.

5.9.2 Impacts

WPL will avoid sites having de minimis conditions, as documented in the Phase I Environmental Site Assessment. Turbine hydraulic oils and lubricants will be contained within the turbine nacelle, or in the case of car, truck, and equipment fuel and lubricants, within the vehicle. Transformer oil will be contained within the transformer. Fluids will be monitored during maintenance at each turbine and transformer. A small amount of hydraulic oil, lube oil, grease, and cleaning solvent will be stored in the O&M building. When fluids are replaced, the waste products will be handled according to regulations and disposed of through an approved waste disposal firm.

5.9.3 Mitigation Measures

Because there are no proposed impacts to hazardous waste sites, no mitigation measures are necessary. If any wastes are generated during construction or operation of the Project, they will be handled, processed, treated, stored, and disposed of in accordance with Minn. Rule 7045. Compliance with these requirements will be the responsibility of WPL. If an external contractor encounters waste material either during the construction phase or during O&M work once the Project commences operation, WPL will be notified and will direct related activities.

5.10 EFFECTS ON LAND-BASED ECONOMICS

5.10.1 Agriculture/Farming/Forestry/Mining

5.10.1.1 Description of Resources

Agriculture/Farming

Approximately 81% of productive land in Freeborn County is farmed or used for rotational animal pastures. Because land use in the Project Area is representative of general land use in the County, this percentage, when applied to the total Project Area of 32,500 acres, results in approximately 26,325 acres being used for agricultural purposes. Within the Project Area, the trend is toward fewer and larger farms, with some farms participating in the CRP or RIM programs.

Based on 2002 data, the majority of croplands in Freeborn County are planted with soybeans and corn. Alfalfa, small grains, forage, and pasture are additional crops in the Project Area.

Large-scale animal production has been a growing component of the agricultural industry in recent years. Feedlots used for the confined feeding, breeding, or holding of animals are a common practice for animal production. There are 377 feedlots in Freeborn County that have 50 or more animal units, and are required to be registered.

Most of the soil within the Project Area is prime farmland. The U.S. Department of Agriculture Natural Resource Conservation Service identifies prime farmland as the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. It could be cultivated land, pasture land, forestland, or other land. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance.

Forestry

Freeborn County is in the region of Minnesota historically known for its prairie grasslands in the western half of the county, and deciduous woods in the eastern half of the county (according to MDNR website mapping). Economically important forestry resources are not found in the Project Area, as the deciduous woods are considered a scientific and natural area that should be preserved. Forested areas are primarily associated with homes in the form of woodlots and along the creeks, rivers, and lakes within the Project Area.

Mining

Mineral deposits in southern Minnesota consist of sand and gravel from unconsolidated surface deposits, building stone from quartzite rock units, and scattered clay/shale deposits or brick making. Sand and gravel resources occur in glacial till and outwash deposits. Many of the industrial pits are inactive or abandoned, or their use is limited to the landowner. There are no active industrial pits or quarries in the Project Area (according to the MDOT Website, Office of Materials – Aggregate Source Information System).

5.10.2 Impacts

5.10.2.1 Agriculture/Farming

Specific impacts to agricultural lands (approximately 26,325 acres) will be determined once turbine and access road placement and substation/O&M building locations have been finalized. Most of the soil within the Project Area is considered prime farmland. The loss of agricultural land to the construction of the Project will reduce a small amount of land that can be cultivated. Less than one half of one percent of the total Project Area will be converted to non-agricultural land use. This will not significantly alter crop production in the Project Area or Freeborn County.

Turbine and facility siting will include discussions with property owners to identify features on their property, including drain tile, which should be avoided. Impacts to drain tile due to Project construction and operation are not expected.

WPL will avoid all impacts to RIM land, and will minimize impacts to CRP land.

5.10.2.2 Forestry

No impacts are expected to economically important forestry resources. Because a majority of the woodlots are associated with homesteads, no impacts are expected to woodlots.

5.10.2.3 Mining

Impacts to mining are not expected. Sand and gravel operations tend to be small and other occurrences of these materials are likely to be present in nearby areas, including large commercial operations in the general area.

5.10.3 Mitigation Measures

5.10.3.1 Agriculture/Farming

The turbines and access roads will be located so that the most productive farmland (prime farmland) will be avoided as much as possible. Only land for the turbine, certain electrical equipment, and access roads will be taken out of crop production. Once the turbines are constructed, all land surrounding the turbines and access roads may still be farmed.

In the event that there is damage to drain tile as a result of construction activities or operation of the Project, WPL will work with affected property owners to repair the damaged drain tile in accordance with the Easement Agreements.

If CRP land is impacted, WPL will work with the landowner to remove the impacted portion of the parcel from the CRP program. There will be no impacts to RIM land, and therefore no mitigation will be necessary.

5.10.3.2 Forestry

WPL does not expect any forestry impacts, and therefore no mitigation will be necessary.

5.10.3.3 Mining

Turbines and access roads will not be located within sand and gravel operations. Therefore, no mitigation will be necessary.

5.11 TOURISM AND COMMUNITY BENEFITS

5.11.1 Description Of Resources

Tourism in Freeborn County focuses on promoting the area's game and wildlife, lakes, farms, and villages. Also publicized are culture (museums, art, and antiques) and recreation activities

(parks, hiking trails, camping, canoeing, horseback riding, fishing, wildlife refuges, snowmobiling, golf courses, swimming pools, tennis courts, and skiing). The county hosts a variety of festivities and cultural events throughout the year.

Wind development in southern Minnesota is becoming a significant tourist attraction, bringing more visitors to the local community.

5.11.2 Impacts

No negative impacts are expected to local tourism. WPL will work with local community officials to increase public knowledge of wind energy development.

5.11.3 Mitigation Measures

No negative impacts are expected, and therefore, no mitigation is necessary.

5.12 TOPOGRAPHY

5.12.1 Description Of Resources

The general topography of the Project Area consists of rolling hills with elevations ranging from approximately 1,250 to 1,320 feet. Small lakes and creeks are scattered throughout the area with the primary water body being the Le Seuer River.

5.12.2 Impacts

It is expected that general topographical features within the Project Area will not be impacted. Although the installation of turbines and access roads will require some soil excavation and fill activities, these impacts will be temporary in nature and will not alter general landscape features as they exist today.

5.12.3 Mitigation Measures

No permanent impacts are expected. However, as a general practice, WPL will return disturbed areas to their original condition. Procedures outlined in the Project's Stormwater Pollution Prevention Plan (SWPPP) will be followed to minimize soil erosion.

5.13 SOILS

5.13.1 Description Of Resources

The soils in Freeborn County are mostly deep and loamy. These soils range from tight clays to porous sands and gravels. They formed extensively in glacial till and less extensively in glacial outwash, lacustrine sediments, alluvium, and organic material. Varying parent materials, topography, and native vegetation reflect the number of different soils present.

5.13.2 Impacts

Construction of the wind turbines, access roads, and other facilities will increase the potential for soil erosion during construction, and convert prime farmland from agricultural uses to industrial uses. The amount of land that will be converted to turbines, transformer pads, and access roads will be determined once the site layout has been finalized.

5.13.3 Mitigation Measures

A National Pollutant Discharge Elimination System (NPDES) Permit to discharge storm water from construction activities will be acquired from the MPCA. This permit will require development of a SWPPP which will be implemented at the Project Area. The SWPPP will include Best Management Practices (BMP), which are defined in Minn. Statute 103F.711 of the Minnesota Clean Water Partnership Act as practices, techniques, and measures that prevent or reduce water pollution from nonpoint sources by using the most effective and practicable means of achieving water quality goals. BMPs include, but are not limited to, official controls (ordinances and regulations), structural and nonstructural controls, and O&M procedures. Essentially, BMPs are methods that can be used to reduce and control soil erosion and sediment runoff during and after construction activities. BMPs may include containing excavated material, protecting exposed soil, and stabilizing restored material. In addition, the placement of turbines and access roads will be planned so that the conversion of prime farmland will be minimized.

The SWPPP will be completed at the time WPL is applying for the NPDES permit, and will be reviewed with the general contractor overseeing construction activities. It is expected that the onsite contractors will be responsible for performing site inspections and maintaining those records as indicated in the SWPPP. The NPDES permit will be obtained prior to commencement of construction at the Project Area. Construction activities are expected to begin during 2009.

5.14 GEOLOGIC AND GROUNDWATER RESOURCES

5.14.1 Description Of Resources

The geology in this area of Freeborn County is characterized by glacial landforms and sedimentary bedrock, with limestone and dolomite especially prevalent near the surface. Groundwater exists in unconsolidated glacial deposits and in the underlying bedrock. These bedrock aquifers are among the highest water yielding in the United States. The groundwater supplies contained within the bedrock aquifer are adequate for present and future water use needs. Estimated water yields in glacial outwash range from 100 to 500 gallons per minute.

These aquifers are the:

(a) Cedar Valley, Maquoketa, Galena System.

(b) St. Peter, Prairie du Chien, Jordan System.

(c) Franconia, Ironton, Galesville System.

(d) Mt. Simon, Hinckley System.

Current data suggests good hydraulic connection between the bedrock units within each of the four (4) aquifer systems. Most domestic and farm water wells draw supplies from the uppermost bedrock aquifer (Cedar Valley, Maquoketa, and Galena Limestones).

The Minnesota Department of Health's Online County Well Index was reviewed to determine if domestic groundwater supply appears to be fairly accessible in the Project Area. The database indicated a total of 65 wells in the Project Area with static water levels ranging from 60 to 132 feet from the land surface. This does not include public water systems, which may also be available from the towns of Manchester and Hartland. It is expected that yields may vary significantly depending on the source.

5.14.2 Impacts

Impacts to geologic and groundwater resources are expected to be minimal. Water supply needs will be limited for Project operations. It is probable that O&M water requirements will be satisfied with either a well or rural water service. If the water use is not already permitted through an outside source (e.g., municipal water system) and usage requirements are estimated to exceed 10,000 gallons/day and/or 1 million gallons/year, WPL will obtain a Water Appropriation Permit from the MDNR as prescribed by Minn. Statutes, Chapter 1036 and Minn. Rules 6115.0600 – 6115.0810.

If WPL needs to install a well to meet Project water usage demands, the well must be properly constructed and maintained to protect groundwater resources. The Well Management Program has established standards for well construction. Permits are not required for well installations. However, notification to the State Health Commissioner at the Minnesota Department of Health is required prior to commencement of construction.

5.14.3 Mitigation Measures

The MPUC has not established a minimum setback for water sources. Turbine locations will not impact the use of existing water wells because the turbines will not be sited within close proximity (less than 100 feet) of these structures.

5.15 SURFACE WATER AND FLOODPLAIN RESOURCES

5.15.1 Description Of Resources

Surface waters and floodplain resources for the Project Area were identified by reviewing U.S. Geological Survey topographic map, the Minnesota Public Waters Inventory map for Freeborn County, the National Wetlands Inventory, and Flood Insurance Rate Maps available from the Federal Emergency Management Agency (FEMA). The review was focused on identifying major surface waters and areas that are prone to flood events.

Surface water features identified from available data include the Le Sueur River and isolated wetlands scattered across the Project Area. FEMA data indicated that portions of the area were subject to minimal flooding. Based on archived information for this portion of the County, the Project Area is not located in a floodplain and flood events of historic proportions have not occurred. This has been confirmed through discussions with the MDNR.

5.15.2 Impacts

Construction of the turbines, transformer pads, and access roads will disturb land within the Project Area. The turbines will be built on ridges, and this will avoid streams and wetlands located in the lower positions in the landscape. Access roads will be designed to minimize impacts to surface waters.

5.15.3 Mitigation Measures

If the Project will impact waters of the U.S. or Minnesota Public Waters, WPL will apply for the necessary permits prior to construction. Access roads constructed adjacent to streams and drainage ways will be designed in a manner so that runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. A SWPPP will be prepared and an NPDES permit will be obtained prior to the construction of the Project.

5.16 WETLANDS

5.16.1 Description Of Resources

A preliminary investigation into wetland locations has been completed. The investigation focused on information listed in the National Wetlands Inventory (NWI) database, as maintained by the USFWS. The NWI data indicates the potential for isolated wetlands, primarily throughout low-lying portions of the Project Area. A field survey will be completed by the end of June 2008 to confirm the presence of isolated wetlands and to delineate any areas of concern.

The wetland delineations will be used when determining a permanent site layout. If areas planned for Project development coincide with wetland-delineated areas, consultation with the State Board of Water and Soil Resources and U.S. Army Corps of Engineers on permitting requirements will be initiated. Data from the field survey will be used to demonstrate whether the Project will result in wetland impacts and whether a Section 404 Permit will need to be obtained from the U.S. Army Corps of Engineers prior to construction.

5.16.2 Impacts

Based on the preliminary turbine array and the wetlands identified from the NWI, it appears that wetlands may be located very close to Turbine Nos. 2, 84 and 186 (*see* Appendix A, Exhibits A-5 and A-6). The field survey discussed earlier will confirm the presence of wetlands. If necessary, impacts at these proposed turbine locations will be assessed.

5.16.3 Mitigation Measures

Once locations for turbines, access roads, electrical lines and other support facilities have been determined, equipment locations will be compared to identified wetland locations. WPL will determine if alternate locations for Project equipment are necessary and feasible. If site development activities in areas where wetlands have been delineated cannot be avoided, WPL will work with the U.S. Army Corps of Engineers to minimize impacts and develop appropriate mitigations.

5.17 VEGETATION

5.17.1 Description Of Resources

Based on maps of vegetative species in Freeborn County, the predominant habitat is cultivated land. However, isolated areas of grassland, wetlands and forested vegetation occur. An inquiry with the MDNR was performed to determine if any rare plant species or other significant natural features are known to occur within an approximate 1-mile radius of the Project Area. MDNR reviewed the Minnesota Natural Heritage database, which indicated that the Project Area intersects an Oak Forest native plant community (T104N, R22W, Section 24) along with areas that may contain native prairie remnant, especially along railroad rights-of-way. A field survey of the Project Area will be completed by the end of June to confirm those areas that contain these native plant resources.

5.17.2 Impacts

The amount and type of vegetation that will be removed as a result of the Project will be determined once a permanent site layout is established. The vegetation will be permanently removed and replaced by turbines, access roads, and transformers. The turbines will be constructed at a certain distance from forests and groves to maximize turbine output and reduce tree removal.

The Project will require a new O&M building and substation. These sites will be owned by WPL and will require 5 to 10 acres of land. Additional acreage will be temporarily impacted for contractor staging and lay down areas. Additional areas may also be disturbed for installation of underground power lines during site construction.

5.17.3 Mitigation Measures

The following measures will be used to avoid and minimize potential impacts to the vegetation of the Project Area during siting, construction, and operation:

(a) Complete a pre-construction inventory of the Project Area by the end of June 2008 for existing WMAs, scientific and natural areas, recreation areas, wetlands, native prairie, and forests;

(b) Exclude established WMAs, recreation areas, scientific and natural areas, wetlands, native prairie, and forests from consideration for turbine, access road, or electrical line placement;

(c) Avoid disturbance of wetlands during construction and operation of the Project. If jurisdictional wetland impacts are proposed, then the WPL will apply for wetland permits;

(d) Minimize the need to clear existing trees and shrubs;

(e) Reseed temporarily disturbed areas to blend in with existing vegetation;

(f) Use BMPs during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored material, re-vegetating non-cropland and range areas with wildlife conservation species, and planting native tall grass prairie species in cooperation with landowners; and

(g) Avoid impacts to native prairies during construction and operation of the Project. If avoidance is not feasible, minimize impacts through the development of a prairie protection and management plan. WPL will prepare the plan based on input from the MDNR, and it will include a botanical survey. The plan shall include steps taken to identify native prairie within the Project Area and measures to minimize and mitigate for unavoidable impacts. Turbines and all associated facilities, including foundations, access roads, underground cable, and transformers, shall not be placed in native prairie unless addressed in the prairie management plan. Mitigation measures will be agreed to by WPL and the MDNR. With respect to the botanical survey, discussions with the MDNR on potential contractors, survey protocol, and other requirements will occur before survey work is initiated. The plan, including botanical survey details, will be submitted to the MPUC and MDNR after issuance of the site permit and prior to the commencement of construction.

5.18 WILDLIFE

5.18.1 Description Of Resources

In general, wildlife in the Project Area consists of birds, mammals, fish, reptiles, amphibians, and insects. Both resident and migratory wildlife can utilize the available habitat in the Project Area for forage, breeding, and/or shelter. The resident species are representative of Minnesota game and non-game fauna that are associated with upland grass and farmlands, along with a few wetland and forested areas. The majority of the migratory wildlife species are birds, including waterfowl, raptors, and songbirds.

Inquiries to the USFWS and MDNR on the existing wildlife in the Project Area did not identify specific wildlife species for which impacts from the Project should be addressed. Specific

information concerning threatened and endangered species is provided in Section 5.19. The USFWS did raise general concerns related to avian interactions and the requirement to comply with the Migratory Bird Treaty Act. Therefore, an avian assessment of the Project Area will be completed by the end of June 2008.

WMAs provide habitat, breeding area, and food supply for many types of wildlife. WMAs are state-owned and managed by the MDNR to protect and enhance wildlife habitat. Animal populations, including bird and bat populations, are expected to be denser in these areas. WMAs located in or within 5 miles of the Project Area include the Manchester WMA. A portion of this WMA is located just inside the east-central boundary of the Project Area (T104N, R22W, Section 35 and T103N, R22W, Section 2) and is home to deer, small game, pheasants, waterfowl, turkey, and doves (*see* Appendix A, Exhibit A-7). Following MDNR's recommendation, WPL will coordinate with the Area Wildlife Manager to address any concerns about wind turbines being sited near this WMA. See Section 5.7 for further discussion on WMAs in the Project Area.

5.18.2 Impacts

Based on studies of existing wind power projects in the United States and Europe, the impact to wildlife would primarily occur to avian and bat populations. The avian assessment discussed in Section 5.18.1 will identify avian wildlife that are native to or migrate through the Project Area. Due to the minimal amount of land which will be impacted by construction of the Project, it is not expected that adverse reduction in habitat used for forage or cover, breeding areas, or food supply will occur.

Several existing studies in the Upper Midwest concluded that construction and operation of wind farms produced minimal impacts to wildlife. Following is a summary of conclusions on avian impacts and mortality from these studies.

Avian Monitoring Study (WEST, 2000) - Buffalo Ridge Wind Resource Area (WRA) - Southwest Minnesota:

Following turbine construction, there is a reduction in use of the area within 100 meters of the turbines by grassland breeding birds. Lower avian use may be associated with avoidance of turbine noise, maintenance activities, and less available habitat due to the presence of maintenance roads and clear gravel pads surrounding turbines. On a large-scale basis, reduced use by birds appears to be relatively minor and would not likely have any population consequences on a regional level.

Avian mortality appears to be low compared to other wind facilities in the United States and is primarily related to nocturnal migrants. Resident bird mortality is very low and involves common species. Based on the estimated number of birds that migrate through Buffalo Ridge each year, the number of wind plant-related avian fatalities is likely inconsequential from a population standpoint.

It appears that most bat mortality at Buffalo Ridge involves migrating bats. Most bat fatalities were found from mid-July to mid-September. Similar to birds, inclement weather conditions appear to be related to bat mortalities within the WRA. The study also concluded that bat mortality increased with reduced distance between turbines and wetlands or woodlands.

Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States (WEST, 2001):

Based on current estimates, wind plant-related avian collision fatalities probably represent from 0.01% to 0.02% (i.e., 1 out of every 5,000 to 10,000 avian fatalities) of the annual avian collision fatalities in the United States. During a 9-month study of three wind turbines near Algona, Iowa, no avian fatalities were documented.

Phase I Avian Risk Assessment – Cedar Ridge Wind Power Project – Fond du Lac County, Wisconsin (Curry & Kerlinger, 2006)

Habitat within the Project Area was relatively degraded with respect to wildlife use as a result of intensive agricultural practices. Mowed grasslands greatly reduce the likelihood of successful breeding by many rare and common species, as a result of nest, egg, and young bird destruction by mowing equipment and tractor wheels. The lack of essential bird habitat is also the result of the Project Area not including federal, state, county, and private-protected areas.

Impacts to migratory birds will be low due to a lack of extensive wetlands. Also, most water birds, hawks, and songbirds will migrate at altitudes higher than the sweep of the wind turbine rotors within the Project Area.

Some displacement of avian species will occur. However, it is unlikely that any listed grassland species would nest at hilltop agricultural sites where wind turbines would be constructed. Because woodland birds are accustomed to environments with tall structures, displacement impact would be significantly less overall than with grassland birds. No displacement of water birds is expected, because wind turbines would not be located close to marshes or wetlands.

5.18.3 Mitigation Measures

WPL is committed to minimizing vegetation and wildlife impacts within the Project Area. To help avoid potential wildlife impacts, implementation of the following measures will be performed, to the extent practicable, during selection of turbine locations and subsequent Project development and operation:

(a) Complete a pre-construction inventory of existing biological resources, native prairie, and wetlands in the Project Area by the end of June 2008;

(b) Exclude established WMAs, recreation areas, scientific and natural areas, wetlands, forests, and native prairie from consideration for wind turbine, access road, or feeder/collector line placement;

(c) Avoid or minimize disturbance of individual wetlands or drainage systems during construction of the Project;

(d) Avoid or minimize placement of turbines or Project-related equipment in high quality native prairie tracts or other high use wildlife habitat;

(e) Protect existing habitat (i.e. vegetation, trees, and shrubs) that are important to the wildlife present in the area;

(f) Avoid construction activities within deer-wintering yards during winter;

(g) Maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, BMPs for erosion and sediment control will be utilized. These practices may include temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization;

(h) Construct turbines using tubular monopole towers to minimize perching;

(i) Light turbines according to FAA requirements;

(j) Place electrical collection lines underground as practicable and minimize infrastructure.

(k) Re-vegetate non-cropland and pasture areas disturbed during construction or operation with an appropriate native seeding mix;

(l) Inspect and control noxious weeds in areas disturbed by the construction and operation of the Project; and

(m) Incorporate USFWS's *Interim Guidelines To Avoid and Minimize Impacts from Wind Turbines* into the design of the Project.

5.19 RARE AND UNIQUE NATURAL RESOURCES

5.19.1 Description Of Resources

The USFWS and the MDNR were contacted to review the Project for threatened and endangered species and unique habitats. The USFWS issued an email response dated February 6, 2008 confirming no records of federally listed threatened or endangered species or critical habitats in the Project Area.

The MDNR reviewed the Minnesota Natural Heritage Information System (NHIS) database through their Natural Heritage Program and Non-game Game Wildlife Program. This database is the most complete source of data on Minnesota's rare, endangered, or otherwise significant

plant and animal species, plant communities, and other rare natural features. The NHIS data was reviewed for recorded occurrences of special status species, plant communities, or other unique natural features within a one–mile radius of the Project Area.

The NHIS database indicated seven known occurrences of rare species or native plant communities within a one-mile radius of the Project Area. The species identified in Freeborn County, and their state status, are as follows: (a) sullivant's milkweed (threatened); (b) native plant community, undetermined class (not applicable)[2]; (c) rattlesnake-master (special concern); and (d) valerian (threatened).

5.19.2 Impacts

The MDNR indicated that species that may be impacted by the Project are an Oak Forest native plant community and native prairie remnants in the railroad rights-of-way located just outside the Project Area. The native prairie remnants are located in T104N, R22W, Section 4 (Northwest corner of the Project Area) which does not show any planned turbine sites. Therefore no impacts are expected to the various prairie species. The Oak Forest native plant community has been documented in the northern half of T104N, R22W, Section 24 and is a remnant of the Big Woods common to this area in the 1850s. The current site layout map indicates proposed turbine locations in this vicinity. As discussed in Sections 5.17.1, a field survey will be completed by the end of June 2008 to confirm the presence of the identified species. WPL will avoid impacts to these species to the extent practicable.

5.19.3 Mitigation Measures

WPL will implement the following measures to avoid potential impacts to federal and state-listed species and rare or sensitive habitat in the Project Area during selection of the turbines and access roads and the subsequent development and operation of the Project:

(a) Complete a pre-construction inventory of existing state-listed, threatened, and endangered species and unique wildlife and habitats in the Project Area by the end of June 2008;

(b) Avoid or minimize disturbance of individual wetlands or drainage systems during construction of the Project; and

(c) Avoid or minimize placement of turbines in sensitive habitats.

5.20 SUMMARY OF IMPACTS

Included below is a summary of the impacts to key resources found within the Project Area, including visual resources, land use, noise, cultural resources, air traffic, wetlands, wildlife, and rare/unique natural resources:

[2] Native plant communities have no legal status under the Endangered Species Law. Therefore, their status is given as "not applicable."

(a) The turbine arrays will be prominent features in the landscape. By design, these structures are placed in open areas of higher elevations. Some mitigation measures, as described in Section 5.4, can be implemented to somewhat limit visual impacts. However, there is no way to make these structures unnoticeable. The degree to which the visual impacts are considered adverse is subjective, and can be expected to vary depending, for example, on how often the viewer sees the turbines.

(b) Approximately one-half of one percent of the Project Area will be permanently converted from natural vegetation or agricultural field for turbines, access roads, and transformer pads. An additional 5 to 10 acres of land will be used for the O&M building and substation. The existing land use will continue on the remainder of the land.

(c) When in motion, the turbines emit a perceptible sound. The level of this noise varies with the speed of the turbine and the distance of the listener to the turbine. On relatively windy days, the turbines create more noise. However, the ambient or natural noise level from the wind tends to override the turbine noise as distance from the turbines increases. Predicted noise levels for receptors in the Project Area were less than the most stringent MPCA noise standard. Turbines will be located at least 500 feet from occupied homes to ensure meeting the MPCA noise standard.

(d) Several historical and archaeological sites are located in the Project Area. Development will not occur at the historical sites. Impact minimization and mitigation measures will be developed and implemented in the event archaeological sites are disturbed during construction activities.

(d) The Manchester WMA is located in the Project Area. WPL will comply with the MDNR request of establishing a one-quarter mile setback around the WMA as a restricted area where Project development activities would not occur.

(e) The Developer has worked with the Albert Lea Municipal Airport and FAA to address potential impacts by the Project on safety corridors and low altitude airways. Adjustments in the Project Area plans will avoid conflicts between proposed wind turbine sites and air traffic, and will result in the issuance of No Hazard Determinations by the FAA for this Project.

(f) Isolated wetlands may be located near a small number of turbines. In general, these areas will be avoided for site development. If development activities in areas where wetlands have been delineated cannot be avoided, WPL will work with the U.S. Army Corps of Engineers to minimize impacts and develop appropriate mitigations.

(g) Birds and bats occasionally collide with turbines. The mortality associated with these collisions has been identified as inconsequential from a population

standpoint on Buffalo Ridge. In addition, turbines may result in reduced use of habitat by grassland bird species within 100 meters (328 feet) of the turbine. WPL will incorporate USFWS's *Interim Guidelines To Avoid and Minimize Impacts from Wind Turbines* into the design of the Project.

(h) Available data from the NHIS database indicated seven known occurrences of rare species or native plant communities within a one-mile radius of the Project Area. Some of these species are located in areas where turbine locations have been proposed. WPL will avoid impacts to these species to the extent practicable and will work with the MDNR to minimize impacts if avoidance is not possible.

(i) The impact of the Project on wildlife is expected to be minimal. Roughly 109 to 163 acres of land will be converted for the access roads, turbine pads, O&M building, and substation. This will reduce available habitat that some wildlife uses for nesting, forage, or cover.

5.21 SUMMARY OF PRECONSTRUCTION INVENTORIES

WPL is preparing the following resource inventories for the Project Area prior to construction:

(a) Biological Resources. Is an inventory of existing WMAs, recreation areas, wetlands, native prairies, forests, wildlife, threatened/endangered species, vegetation, rare/unique natural resources, and other biologically sensitive areas within the Project Area;

(b) Cultural Resources. Is an inventory of historical and archaeological sites within the Project Area;

(c) Communication Resources. Is an inventory of microwave paths and existing radio frequency facilities within the Project Area; and

(d) Industrial Resources. Is data obtained from a Phase I Environmental Site Assessment for the Project Area.

WPL will submit copies of these preconstruction inventories to the MPUC at the preconstruction meeting.

5.22 EXCLUSION AND AVOIDANCE CRITERIA AND SITE DESIGNATION

State law governing the siting of traditional electric generating facilities requires that certain environmental features be avoided. These requirements will be applied in determining the final location of the proposed turbines and related appurtenances on the Project Area. The preconstruction inventories discussed in Section 5.21 will identify those features that exist within the Project Area. The following table provides a preliminary summary of exclusion/avoidance features, which will be confirmed once field surveys are completed. For those categories where these exclusion/avoidance features are present within the Project Area, the final locations of the

turbines and related appurtenances will be selected to not interfere with them. Therefore, for a given type of environmental feature, this review will reflect the ease, or degree of flexibility, in siting the turbines.

Table 5-1 Exclusion/Avoidance Features Relative to Project Area

Exclusion/Avoidance Feature	Presence in Project Area
National Parks	None
National Historic Sites	None
National Historic Districts	None
National Wildlife Refuges	None
National Monuments	None
National Wild, Scenic and Recreational Riverways	None
National Wilderness Areas	None
State Wild, Scenic and Recreational Rivers	None
State Parks	None
Nature Conservancy Preserves	None
State Scientific and Natural Areas	None
State Wilderness Areas	None
Registered Historic Sites/Dist.	Present
State Wildlife Management Areas	Present
County and Municipal Parks	None
State and Federal Rec. Trails	None
Designated Trout Streams	None
DNR Canoe/Boating Routes	None
Prime Farmlands	Present
Wetlands	Present
Streams Within Site Boundaries	Present
Residences	Present

6.0 IDENTIFICATION OF REQUIRED PERMITS/APPROVALS

The following table summarizes major environmental areas which require assessment and review of permit requirements for the Project.

Table 6-1 Permits and Approvals

Agency	Type of Approval
Federal Permits	
Federal Aviation Administration	Notice of Proposed Construction or Alteration (Form 7460-1) within 6 miles of Public Aviation Facility and structures over 200 feet; No Hazard Determinations; Notice of Actual Construction (Form 7460-2)
U.S. Army Corps of Engineers	Wetland (Section 404) Permit
State of Minnesota Permits	
Minnesota Public Utilities Commission	LWECS Site Permit
Minnesota Public Utilities Commission	Certificate of Need

Agency	Type of Approval
Minnesota Board of Water and Soil Resources	Wetland Conservation Act Approval
Minnesota Department of Natural Resources	Navigable Waterways
Minnesota Department of Natural Resources	Water Use Permits
Minnesota Pollution Control Agency	NPDES General Stormwater Permit for Construction Activities
Minnesota Pollution Control Agency	Section 401 Water Quality Certification
Minnesota Department of Transportation	Utility Permit for Road Crossing, Highway Access Permit; Oversize and Overweight Permit; Tall Towers Permit
Local Permits	
Freeborn County	Building Permits, Driveway Permit, Public Road and Utility Access Permit, Utility Permit for Road Crossing, Moving Permit
Townships	Public Road Access Permits, Utility Permits for Road Crossing

Correspondence with Permitting Agencies. Please refer to Appendix E for copies of this correspondence.