STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

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In the Matter of the Application of Paynesville Wind, LLC for a Site Permit for a 95 Megawatt Large Wind Energy Conversion System in Stearns County

ISSUE DATE: January 26, 2011

DOCKET NO. IP-6830/WS-10-49

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER ISSUING A SITE PERMIT TO PAYNESVILLE WIND, LLC FOR THE PAYNESVILLE WIND FARM

The above-entitled matter came before the Minnesota Public Utilities Commission (Commission) on January 29, 2010, pursuant to an application submitted by Paynesville Wind, LLC (Paynesville Wind or Applicant) for a site permit to construct, operate, maintain, and manage the Paynesville Wind Farm (Project), a 95 Megawatt (MW) nameplate capacity Large Wind Energy Conversion System (LWECS), including associated facilities, in Stearns County.

All of the proposed wind turbines and associated facilities will be located in Stearns County. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection system including feeder and collector lines, a permanent meteorological tower, a Sonic Detection and Ranging unit or Light Detection Ranging unit, a project substation, and a metering yard. The energy from the proposed 95 MW Project will be delivered from the project substation via a 69 kV transmission line, which is anticipated to be permitted locally by Stearns County, to the existing Paynesville Substation in Paynesville Township in Stearns County.

STATEMENT OF ISSUE

Should the Applicant be granted a site permit under Minnesota Statutes section 216F.04 to construct a 95 MW Large Wind Energy Conversion System in Stearns County?

Based upon the record created in this proceeding, the Public Utilities Commission makes the following findings:

FINDINGS OF FACT

Background and Procedure

1. On January 29, 2010, Paynesville Wind filed an application with the Public Utilities Commission for up to 95 megawatts of nameplate wind power generating capacity identified as the Paynesville Wind Farm in Stearns County.[1]

2. Office of Energy Security (OES) Energy Facility Permitting (EFP) staff reviewed and determined that the application complied with the application requirements of Minnesota Rule 7854.0500.[2]

3. On March 9, 2010, a Commission Order was issued accepting the application for the Paynesville Wind Farm.[3]

4. On March 18, 2010, OES EFP staff issued a notice of application acceptance and scoping meeting.[4] This notice was posted on eDockets on March 30, 2010, and on the Commission's website on March 23, 2010.

5. Published notice of site permit application acceptance and opportunity to comment on the permit application and issues to consider in the development of a draft site permit appeared in the *Cold Spring Record* on March 30, 2010, and *The Paynesville Press* on March 31, 2010.[5] The published notice provided: a) description of the proposed project; b) deadline for public comments on the application; c) description of the site permit review process; and d) identification of the public advisor. The notice published meets the requirements of Minnesota Rule 7854.0600, subpart 2. The notice was also published in the *EQB Monitor* on March 22, 2010.[6]

6. On March 23, 2010, the Applicant distributed copies of the site permit application and notice of application acceptance to government agencies and to landowners within the project boundary.[7] The notice was distributed only to those who received the application pursuant to subpart 3. Therefore, not every township board and city council within Stearns County received a notice as required in subpart 2. All township boards and city councils within Stearns County were notified of the availability of the draft site permit as stated in Finding 11.

7. Public comments on the site permit application and issues to consider in the development of a draft site permit were accepted until May 10, 2010. Several comments that came in after the deadline were also reviewed as part of the comment period. OES EFP staff received 32 written comments during the comment period from 26 individuals.[8]

[1] Exhibit 1.
[2] Exhibit 2.
[3] Exhibit 3.
[4] Exhibit 4.
[5] Exhibit 5.
[6] Exhibit 6.
[7] Exhibit 7.
[8] Exhibit 8.

Approximately 115 people attended the public meeting that was held on April 29, 2010, in Lake Henry to receive comments on the scope of the environmental report and issues to be considered in developing the draft site permit. An oral record of the meeting was posted on eDockets.[9]

8. On May 27, 2010, OES EFP staff recommended that a draft site permit be issued and distributed for public comment.[10]

9. On June 4, 2010, a Commission Order made a preliminary determination that a draft site permit may be issued.[11]

10. On June 16, 2010, OES EFP staff issued a notice of availability of the draft site permit.[12] The notice met the requirements of Minnesota Rule 7854.0900, subpart 1. This notice was posted on eDockets on June 21, 2010, and posted on the Commission website on June 16, 2010. The notice was published in the *Cold Spring Record* on June 22, 2010, *The Paynesville Press* on June 23, 2010, and in the *EQB Monitor* on June 28, 2010.[13] Notice was sent to interested persons and government agencies.[14] Distribution of the notice of availability of the draft site permit met the requirements in subpart 2.

11. On August 11, 2010, OES EFP issued a notice of public hearing and availability of the environmental report and draft site permit.[15] This notice was posted on eDockets and the Commission website on August 12, 2010. Published notice of the public hearing and availability of the draft site permit and environmental report appeared in the *Cold Spring Record* on August 17, 2010, *The Paynesville Press* on August 18, 2010, *St. Cloud Times* on August 13, 2010, and the *EQB Monitor* on August 23, 2010, as required by Minnesota Rule 7854.0900, subpart 2.[16] Notice was sent to interested persons and government agencies as required by Minnesota Rule 7854.0900, subpart 2.[17] Notice was also sent to landowners in the Project area.[18] The deadline for submitting comments on the draft site permit was September 8, 2010.

12. Public hearings were held on the afternoon and evening of August 25, 2010, in Paynesville, Minnesota, presided over by Administrative Law Judge Raymond Krause from the Office of Administrative Hearings. Approximately 50 people attended the public hearing and 22 people offered testimony. A court reporter prepared a record of the public hearing.[19]

[9] Exhibit 9.
[10] Exhibit 10.
[11] Exhibit 11.
[12] Exhibit 12.
[13] Exhibits 13 and 14.
[14] Exhibit 13.
[15] Exhibit 15.
[16] Exhibits 17 and 18.
[17] Exhibit 15.
[18] Exhibit 16.
[19] Exhibit 19.

13. On September 22, 2010, Administrative Law Judge Raymond Krause filed a "Summary of Public Testimony.[20] Written comments were also posted on eDockets.[21]

Certificate of Need

14. The Applicant is seeking a certificate of need because the Project is a large energy facility as defined by Minnesota Statutes section 216B.2421.[22]

Permittee

15. Paynesville Wind is a wholly owned subsidiary of Geronimo Wind Energy, which may sell or assign the Project at any time.[23]

16. Paynesville Wind does not have a power purchase agreement or other enforceable mechanism for the sale of the power to be generated by the Project.

Interconnection Agreement

17. Paynesville Wind does not yet have an interconnection agreement.

Project Description

18. The Project will be comprised of up to 60 General Electric (GE) 1.6 MW wind turbine generators, up to 53 Vestas 1.8 MW turbines, or up to 42 Siemens 2.3 MW wind turbine generators.[24] The Project name plate capacity will be 95 MW. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an underground electrical collection system (feeder and collector lines), a permanent meteorological tower, a Sonic Detection and Ranging unit or Light Detection Ranging unit, a Project substation, and possibly a metering yard. The Project's turbine locations and associated facilities are shown on maps posted on eDockets on November 9, 2010, and are attached to the site permit.[25]

19. Because Midwest Independent Transmission System Operator (MISO) is currently reviewing interconnection facilities for this Project, it is unclear how electricity will be delivered to the point of interconnection at the existing Paynesville Substation. In its application, the Applicant anticipated delivery of power through a collection system to two separate locations, both of which will connect to the existing Paynesville Substation. The electricity from a group of turbines totaling 50 MW would be transported via the collection system, operating at 34.5 kV, to the project substation, which will step up the voltage to 69 kV and be transported on a new 69 kV line of less than one mile in length to

[20] Exhibit 20.
[21] Exhibit 21.
[22] Exhibit 1 at 1-4.
[23] *Id.* at 1-5.
[24] *Id*. at 4-1 and Exhibit 22.
[25] Exhibit 25.

the Paynesville substation.[26] The electricity from the remaining turbines would be transported via the 34.5 kV collection system and delivered to a new metering yard adjacent to the Paynesville substation where it would connect to the Paynesville substation.[27] Paynesville Wind is also considering delivering all 95 MW of electricity to a Project substation that could be located near the existing substation or up to approximately four miles north of the existing substation.[28] This may include an alteration of the line voltage as initially described in its application.[29] The turbine layout maps attached to the site permit (see Attachment 1) include three possible substation locations. Two possible substation locations are shown on maps submitted by the Applicant at Exhibit 25.

20. The 34.5 kV electrical collection system will be undergrounded by trenching, plowing, or drilling the cables.[30] The electrical collection system will only be located above ground when shallow bedrock, restrictive environmental conditions, or conflicts with underground utility infrastructure are encountered.[31] Because shallow bedrock is not present and Stearns County has an ordinance requiring that all feeder lines be buried unless shallow bedrock is present, section 13.1.1 of the site permit requires that the collector and feeder lines be underground.

21. The 69 kV transmission line will be permitted by Stearns County. The operation and maintenance building will be permitted by Stearns County or the township where the facility will be located, and will likely be outside the Project area.[32]

22. The turbine towers will be either 262.5 feet (80 meters) or 328 feet (100 meters) in height.[33] Based on turbines under consideration, the total height of the tower and blade in the vertical position will range from approximately 398 feet (121.25 meters) to 428 feet (130.5 meters) if the 80 meter towers are selected. The total height of the tower and blade in the vertical position will range from approximately 463 feet (141.25 meters) to 493.8 feet (150.5 meters) if the 100 meter towers are selected. The rotor diameter for the GE turbine is 270 feet (82.5 meters) and the rotor swept area is 50,127 square feet (4,657 square meters). The rotor diameter for the Siemens turbine is 331 feet (101 meters) and the rotor swept area is 86,111 square feet (8,000 square meters). The rotor diameter for the Vestas turbine is 295 feet (90 meters) and the rotor swept area is 68,477 square feet (6,361 square meters). The GE turbine has a rotor speed that varies from 9 to 18 revolutions per minute, a cut-in wind speed of 7.8 miles per hour, and a cut-out wind speed of 56 miles per hour. The Siemens turbine has a rotor speed that varies from 6 to 16 revolutions per minute, a cut-in wind speed of 8.9 miles per hour, and a cut-out wind speed of 56 miles per hour.[34] The Vestas turbine has a rotor speed that varies from 9 to

[26] Exhibit 1 at 2-3.
[27] *Id*.
[28] Exhibit 25.
[29] *Id*.
[30] Exhibit 1 at 2-3.
[31] *Id*.
[32] *Id*. at 1-3.
[33] Exhibit 22.
[34] Exhibit 1 at 2-2.

14.9 revolutions per minute, a cut-in wind speed of 7.8 miles per hour, and a cut-out wind speed of 56 miles per hour.[35]

23. Paynesville Wind will select a turbine type as the Project nears construction to ensure the selection of the most cost-effective, available, and optimal design for the Project site.[36] The GE, Vestas, and Siemens turbines have a similar rotor and nacelle design. The rotor consists of three blades, composed of carbon fibers and fiberglass, mounted to the hub, which is attached to the nacelle that houses the main components of the wind turbine, including the gearbox, generator, and the main control panel. The yaw system automatically directs the orientation of the rotor into the wind based on the wind vane readings from the top of the nacelle. Electricity is produced by the generator and transmitted through insulated cables to the power conditioning unit known as a pad mount transformer located at the base of the tower.

24. Paynesville Wind is considering towers either 80 or 100 meters in height.[37] The Applicant requested the 100 meter tower option in comments e-filed on August 24, 2010 (see Exhibit 22). The Applicant believes that addition energy will be generated if taller towers are used. Towers will be solid tubular in design and are painting a non-glare white. 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.[38] The expected tower foundation will be a spread foundation design.[39]

25. The Project will have one permanent meteorological tower and either a Sonic Detection and Ranging (SODAR) or (Light Detection Ranging) LIDAR unit as part of the associated facilities for this LWECS Project.[40] The meteorological tower will be free standing, made of galvanized steel, and lighted as required by the Federal Aviation Administration.

26. All turbines and the permanent meteorological tower will be interconnected with fiber optic communication cable that will be installed underground. The communication cables will run back to a central host computer, which will be located either at the Project substation or at the operations and maintenance facility where a supervisory control and data acquisition (SCADA) system will be located. Signals from the current and potential transformers at each of the delivery points will also be fed to the central SCADA host computer. This computerized supervisory network will provide detailed operating and performance information for each wind turbine. The Permittee will maintain a computer program and database for tracking each wind turbine's maintenance history and energy production.

[35] *Id.*
[36] *Id.* at 2-1.
[37] *Id.* at 4-3 and Exhibit 22.
[38] Exhibit 1 at 2-1.
[39] *Id.*
[40] *Id.* at 2-4.

27. Paynesville Wind expects to begin commercial operation in the third quarter of 2011.[41]

28. The estimated Project capital costs are estimated to be $197 million and ongoing operations and maintenance are estimated to be $4.8 million per year.[42] If the 100 meter towers are selected, costs will increase approximately $150/kW to $240/kW, which would bring the total estimated capital costs to $206.5 million.[43]

Site Location, Characteristics and Topography

29. The proposed Project will be located in Stearns County, in Paynesville (section 5), Zion (sections 4-9, 16-22, 29-32), Spring Hill (section 36), and Lake Henry (sections 1, 11-13, 22-27) townships in southern Stearns County. The Project area is located north of Paynesville and south and east of Lake Henry. The Project site encompasses approximately 15,000 acres, which is primarily agricultural land.[44] Corn, soybeans and livestock, especially dairy cattle, make up the agriculture-based economy.[45] Elevation varies from 1,161 to 1,332 feet above mean sea level.[46] The Project area is nearly level to gently sloping.[47] Wind turbine and access roads are sited to take into account the contours of the land to minimize impact.

30. Construction of the turbines sites and access roads will involve temporarily disturbing land within the Project area. Temporary access roads will be approximately 40 feet wide and permanent access roads will be approximately 16 to 33 feet wide using crushed rock.[48] Total miles of access roads will be approximately nine miles, depending on final turbine layout.[49]

Wind Resource Considerations

31. Wind monitoring within the Project area indicates that the long-term predicted mean wind speed for the Project is 7.63 meters per second (17.08 miles per hour).[50] Paynesville Wind expects a range of long-term mean annual 80 meter (262 feet) wind speeds will be 7.6 to 7.9 meters per second (17 to 17.676 miles per hour).[51] Wind speeds are generally greater in the night and early morning hours and decline at midday. Regionally, the prevailing wind directions are generally south and northwest. In general, a higher percentage of the annual energy budget results from southerly winds, which are most frequent in the warmer weather months. The north and northwest winds typically occur in winter.

[41] *Id*. at 4-10.
[42] *Id*. at 3-6.
[43] Exhibit 22 (Applicant's post-hearing comments).
[44] Exhibit 1 at 1-2 and 5-1.
[45] *Id.* at 5-1.
[46] *Id*. at 5-21.
[47] *Id*.
[48] *Id*. at 2-3.
[49] Exhibit 25.
[50] Exhibit 1 at 3-1 to 3-2.
[51] *Id*. at 3-1.

32. For this Project, turbines will be generally sited in short strings or clusters within the site boundaries. Wind turbines are sited to have good exposure to winds from all directions with emphasis on exposure to the prevailing wind directions while considering site topography, natural resource features, setbacks and wind resources. The turbines are typically oriented west-southwest to north-northeast, which is roughly perpendicular to the prevailing southerly and northwest winds. Turbine placement, aside from other resource features where setbacks or wind access buffers are required, will be designed to provide sufficient spacing between the turbines to minimize internal wake losses. Given the prevalence for southerly and northerly winds, the spacing is widest in the north-south direction. Greater or lesser spacing between the turbines or turbine strings may be used in areas where terrain dictates the spacing. Sufficient spacing between the turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbines. Wake loss occurs when a turbine is spaced too close downwind of another turbine, and therefore, produces less energy and is less cost-effective. Section 4.10 of the site permit addresses turbine spacing.

33. According to the application, projected average net annual output will be approximately 291,270 to 332,880 MWh (megawatt hours).[52] If 100 meter towers are used, the projected average net annual output will increase approximately 41,000 MWh to 47,000 MWh.[53]

Wind Rights and Easement/Lease Agreements

34. In order to build a wind facility, a developer must secure leases or easement agreements to ensure access to the site for construction and operation of a proposed project. These lease or easement agreements also prohibit landowners from any activities that might interfere with the execution of the proposed Project. Land and wind rights will need to encompass the proposed LWECS, including all associated facilities such as access roads, meteorological towers, and electrical collection system.

35. The Applicant has executed easement agreements that grant Paynesville Wind the necessary wind rights for the construction and operation of the Project. Within the approximately 15,000 acres site, the Applicant has easement agreements for approximately 11,500 acres.[54] Section 10.1 of the site permit requires the Applicant to demonstrate it has obtained the wind rights necessary to construct and operate the Project at least 10 working days before the pre-construction meeting.

Site Considerations

36. Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854 apply to the siting of LWECS. The rules require an applicant to provide a substantial amount of information to allow the Commission to determine the potential environmental and human impacts of the proposed project and whether the project is compatible with environmental

[52] *Id*. at 3-6.
[53] Exhibit 22 (Applicant's post-hearing comments).
[54] Exhibit 1 at 2-4.

preservation, sustainable development, and the efficient use of resources.[55] Pursuant to Minnesota Statutes section 216F.02, certain sections in Minnesota Statutes chapter 216E (Minnesota Power Plant Siting Act) apply to siting LWECS, including section 216E.03, subdivision 7 (considerations in designating sites and routes). The analysis of the environmental impacts required by Minnesota Rule 7854.0500, subpart 7, satisfies the environmental review requirements; no environmental assessment worksheet or environmental impact statement is required for a proposed LWECS project.[56] Therefore, environmental review is based on the application and the record. The following analysis addresses the relevant considerations to be applied to a LWECS project.

Human Settlement

37. The site is in an area of relatively low population density, which is characteristic of rural areas throughout Minnesota. Population densities range from 9 people per square mile in Lake Henry Township to 46 people per square mile in Paynesville Township.[57] The population of the city of Lake Henry, which is adjacent to the Project, was estimated at 78 in 2009, and has decreased over the last decade.[58] The city of Paynesville, which is located 1.5 miles south of the Project, had a population of 2,313 in 2009.[59] In 2009, Stearns County had an estimated population of 148,671.[60]

38. Since December 2009, Stearns County has had authority to permit LWECS up to 25 MW under Minnesota Statute section 216F.08. The Project area is located in an area zoned for agricultural use (A-160 (most restrictive), A-80 (some restrictions), and A-40 (least restrictive)), most of which is zoned A-80.[61]

39. The Applicant has committed to a setback of 750 feet to all residences, regardless of whether that landowner is a participant in the Project, and will not site turbines less than 1,000 feet from residences unless other arrangements have been made with certain landowners. Preliminary turbine layouts on the Applicant's constraint maps show setbacks from residences at 1,000 feet (see Exhibit 25). Stearns County requires a setback of 750 feet from residences. Section 4.2 of the site permit incorporates this setback.

    The Commission recognizes that the Stearns County Board of Commissioners has adopted an Ordinance (November 17, 2009) that establishes a more stringent property line setback requirement than is established in Commission rules or in the Commission's permit standards. Having considered this matter, the Commission respectfully declines to

[55] Minn. Stat. § 216F.03 and Minn. R. 7854.0500.
[56] Minn. R. 7854.0500, subp. 7.
[57] Exhibit 1 at 5-1 (using 2009 data).
[58] Department of Administration, Office of Geographic and Demographic Analysis, State Demographic Center, http://www.demography.state.mn.us/resource.html?Id=19243 (follow hyperlink).
[59] Department of Administration, Office of Geographic and Demographic Analysis, State Demographic Center, http://www.demography.state.mn.us/resource.html?Id=19243 (follow hyperlink).
[60] Department of Administration, Office of Geographic and Demographic Analysis, State Demographic Center, http://www.demography.state.mn.us/resource.html?Id=19244 (follow hyperlink).
[61] Stearns County, http://www.co.stearns.mn.us/Environment/LandUseandAgriculture/PlanningandZoning.

apply the County Ordinance's more stringent standards and will impose the property line setback requirements set forth in Site Permit Section 4.1.

Pursuant to Minn. Stat. § 216F.081, the Commission finds that there is good cause not to adopt the County Ordinance standard in this regard based on the following considerations: 1) the OES has advised that the risk of a turbine falling is very small and stated that only one turbine is known to have fallen in the United States; 2) the Applicant has a reasonable provision in its wind easements to address catastrophic failures including turbine collapse; and 3) the Stearns County Board of Commissioners has commented extensively on other aspects of the Project, but has not identified the absence of its Ordinance's property line setback requirement from the draft Site Permit as a concern.

Accordingly, Paynesville Wind will also be required to set back its turbines a minimum of five rotor diameters (between 1,350 feet and 1,655 feet, depending on turbine selection) on the prevailing wind axis from non-participating landowners' property lines and three rotor diameters (between 810 feet and 993 feet, depending on turbine selection) on the non-prevailing wind axis; this condition can be found in section 4.1 of the site permit.

Paynesville Wind's proposed Project design must comply with the Minnesota Pollution Control Agency (PCA) noise standards pursuant to Minnesota Rules Chapter 7030. A table of setbacks is included in the Applicants comments submitted November 9, 2010 (see Exhibit 25).

40. Stearns County requires a setback from road rights-of-way of 250 feet or 1.1 times the total height of the tower, whichever is greater. However, the Stearns County Chair of the Board of Commissioners submitted comments stating the board does not object to a 250 foot setback, provided the setback is measured from the road to the tip of the blade, not the tower.[62] The Applicant agreed to the Stearns County suggested setback in its comments, dated September 8, 2020.[63] Section 4.4 of the site permit requires that turbines not be located closer than 250 feet from the nearest public road right-of-way. Preliminary turbine layouts show that the Applicant will meet or exceed this setback.

41. There will be no displacement of existing residences or structures in siting the wind turbines and associated facilities. The impact of the proposed Project on human settlement and public health and safety will be minimal.

Noise

42. Wind turbines generate sound or noise when in motion. The level of sound (noise) varies with the speed of the turbine, the distance of the listener or receptor from the turbine, and surface characteristics of the site. Operation and maintenance of wind turbines and associated facilities increases noise levels. However, increases in noise levels are

[62] Exhibit 23.
[63] Exhibit 22 (Applicant's post-hearing comments).

expected to be minimal due to the noise levels produced by the wind itself. –Background noise levels in the Project area are typical of those in a rural setting, 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.

43. Noise impacts to nearby residents will be factored into the turbine micro-siting process. The Applicant must demonstrate the Project can meet the noise standard pursuant to Minnesota Rules chapter 7030 (site permit, sections 4.2 and 4.3). Noise levels predicted by computer models were compared to the Minnesota Pollution Control Agency (PCA) Daytime and Nighttime L10 and L50 Limits as stated in Minnesota 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 conversation requirements for receivers within areas grouped according to land activities by the Noise Area Classification (NAC) system established in Minnesota 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.

44. The Applicant analyzed noise for the Vestas V90 1.8 MW, Siemens 101 SWT 2.3 MW, and the GE 1.6 MW turbine, which replaces the GE 1.5 MW turbine option in its application. Sound is generated from the wind turbine at points near the hub or nacelle, 80 to 105 meters in the air, from the blade tips as they rotate.[64] According to the manufacturers' noise data, sound power levels are 106 dBA for the GE turbine, 103.5 dBA for the Vestas turbine, and 107 dBA for the Siemens turbine.[65] The Applicant used Cadna-A, an acoustical analysis software, for its noise modeling. The modeling did not consider project-specific terrain and assumed flat ground to reduce the opportunity for terrain to potentially block the line-of-sight between turbines and receptors.[66] The Applicant used a ground absorption factor of 0.7, which is suggested by the Ontario Ministry of the Environment.[67] In addition, the modeling conservatively calculated the noise levels at all receptors by assuming that the wind blows in all directions all the time.[68] The Applicant also applied a five dBA buffer suggested in the Minnesota Department of Health white paper, *Public Health Impacts of Wind Turbines*, and anticipates that noise levels will not exceed 45 dBA at noise receptors.[69]

45. Cumulative noise impacts resulting from multiple turbine strings were analyzed and geographically represented in maps in the application.[70] The GE 1.6 MW turbine noise map can be found in the Applicant's post-hearing comments at Exhibit 22. The modeling conducted by the Applicant demonstrates that sound levels for all three turbine layouts

[64] Exhibit 1 at 5-3.
[65] *Id.*
[66] *Id.* at 5-4
[67] *Id.*
[68] *Id.*
[69] *Id.*
[70] *See id.* at figures 5-2 and 5-3 .

are expected to be below 50 dBA at all receptors. The Applicant will conduct noise modeling on preliminary turbine layouts on 100 meter towers.[71] However, the Applicant does not anticipate any additional mitigation would be necessary if 100 meter towers were used.[72]

46. Section 6.6 of the site permit requires Paynesville Wind to conduct a post-construction noise study. The noise study will determine the noise levels at different frequencies and at various distances from the turbines at various wind directions and speeds. The purpose of the post-construction noise study is to confirm the PCA noise standards have been met.

Shadow Flicker

47. Concerns regarding shadow flicker were raised during both public comment periods.[73] Shadow flicker is described as a moving shadow on the ground resulting in alternating changes in light intensity. Shadow flicker computer models simulate the path of the sun over the year and assess at regular time intervals the possible shadow flicker across a project area. The outputs of the model are useful in the design phase of a wind farm. Generally, shadow flicker occurs in the morning and evening hours when the sun is low in the horizon and the shadows are elongated. Shadow flicker does not occur when the turbine rotor is oriented parallel to the receptor or when the turbine is not operating. In addition, no shadow flicker will be present when the sun seen from a receptor is obscured by clouds, fog, or other obstacles already casting a shadow such as buildings and trees.

48. Shadow intensity, or how "light" or "dark" a shadow appears at a specific receptor, will vary with the distance from the turbine. Closer to a turbine, the blades will block out a larger portion of the sun's rays and shadows will be wider and darker. Receptors located farther away from a turbine will experience much thinner and less distinct shadows since the blades will not block out as much sunlight. Shadow flicker will be greatly reduced or eliminated within a residence when buildings, trees, blinds, or curtains are located between the turbine and receptor. Shadow flicker consultants generally agree that flicker is not noticeable beyond about 10 rotor diameters from a wind turbine.[74] Evidence of health effects from shadow flicker is scant, suggesting that it is more of a nuisance issue. Minnesota has no published standards for shadow flicker and no examples of turbines causing photosensitivity related problems. Several jurisdictions in other countries have established guidelines for acceptable levels of shadow flicker based on certain assumptions. The site permit does not contain shadow flicker limits.

49. The Applicant discussed shadow flicker in its comments, dated September 8, 2010. Paynesville Wind plans to engage a consultant, using a widely-accepted software package such as WindPro or GH WindFarmer, to perform shadow flicker modeling for the final

[71] Exhibit 22 (Applicant's post-hearing comments).
[72] *Id*.
[73] Exhibits 8, 9, 19, 20, and 21.
[74] Environmental Health Division, Minnesota Department of Health, *Public Health Impacts of Wind Turbines*, May 22, 2009, at 14, *available at* http://energyfacilities.puc.state.mn.us/documents/Public%20Health%20Impacts%20of%20Wind%20Turbines,%205.22.09%20Revised.pdf.

turbine layout.[75] The model will use actual data from the Project, such a coordinates of receptors, digital elevation data to account for topography, and the physical characteristics of the selected wind turbine.[76] The use of 100 meter towers would likely increase shadow flicker impacts. Section 6.2 of the site permit requires the Paynesville Wind to provide data on the duration of shadow flicker on each residence, noting whether the residence is on property that is participating in the Project, and documentation of efforts to minimize shadow flicker impacts.

Visual Values

50. The placement of up to 60 General Electric (GE) 1.6 MW wind turbine generators, 53 Vestas 1.8 MW turbines, or 42 Siemens 2.3 MW wind turbine generator for the Paynesville Wind Farm will affect the appearance of the area. The wind turbines will be mounted on tubular towers that are either approximately 262 feet (80 meters) or 328 feet (100 meters) tall. The rotor blades will have a diameter between 270 and 331 feet. The turbine towers and rotor blades will be prominent features on the landscape. There will be intermittent, expansive views of the turbines to passing motorists on State Trunk Highways 4 and 55 in addition to nearby roads.[77] Further, the Project may be visible to residents of the cities of Paynesville and Lake Henry and users of public lands (see Findings 73 to 78 for a discussion on recreational resources).

51. The visual impact of the wind turbines will be reduced by the use of a neutral paint color. The only lights will be those required by the Federal Aviation Administration (site permit section 7.18). All site permits issued by the Commission require the use of tubular towers; therefore, the turbine towers will be uniform in appearance. Blades used in the proposed Project will be white or grey. The turbines and associated facilities necessary to harvest the wind for energy are not inconsistent with existing agricultural practices.

52. Wind facilities can be perceived as a visual intrusion on the natural aesthetic value on the landscape or having their own aesthetic quality. Existing wind facilities have altered the landscape elsewhere in Minnesota from agricultural to wind plant/agricultural. This Project will modify the visual character of the area. Wind generation development is likely to continue in Stearns County.

53. Visually, the Paynesville Wind Farm will be similar to other LWECS projects located elsewhere in the state.

Public Health and Safety

54. There are eight airports located in Stearns County within 20 miles of the Project area. A review of the AirNav, LLC (AirNav 2009) database identified the Paynesville Municipal Airport as the only airport within five miles of the Project, which is located two miles south of the Project. The Paynesville Municipal Airport has an asphalt runway of 1,180

[75] Exhibit 22 (Applicant's post-hearing comments).
[76] *Id*.
[77] Exhibit 1 at 33-34.

feet in length and the approach zone for this airport is outside the Project boundary.[78] The Applicant has not yet been issued a "no hazard" determination from the Federal Aviation Administration (FAA). Section 4.12 of the site permit requires the Applicant to avoid placing wind turbines or associated facilities in a location that could create an obstruction to navigable airspace to certain airports. The Applicant must comply with the requirements of the Minnesota Department of Transportation, Department of Aviation, and FAA (site permit sections 10.5.1 and 4.12).

55. The addition of up to 60 wind turbines in active croplands and a permanent free standing meteorological tower increase the potential for collisions with crop-dusting aircraft. The turbines would be visible from a distance and lighted according to FAA requirements (see section 7.18 of the site permit). The permanent meteorological tower will be free standing and have lighting consistent with the turbines. The Minnesota Aeronautical Chart produced by the Minnesota Department of Transportation is available and shows wind turbine locations throughout the state.

56. Some concern was expressed about the ability of emergency medical helicopters to access residents in the Project area during times of emergency. Officials at the Mayo Clinic in Rochester, Minnesota, have noted that impacts on helicopter operations due to wind projects in the area have been insignificant.[79] A Stearns County resolution, which adopted findings of fact to support its decision not to impose a moratorium, concluded that wind turbines are no different than buildings and other towers in respect to emergency response.[80] Stearns County took testimony from Air Medical Services for LifeLink III to support its finding.[81] The Applicant will prepare an emergency response plan in consultation with the emergency responders having jurisdiction over the Project area and provide landowners, interested persons, public officials, and emergency responders with all applicable safety information (see sections 7.15 and 7.16 of the site permit). The Applicant agreed to submit its emergency response plan 60 days prior to the start of construction and obtain approval from the Stearns County Emergency Services Department, which was requested by Stearns County.[82] There is no reason to conclude that the Project poses any more risk to medical helicopters than any other wind farm located in the state.

57. As with any large construction project, some risk of worker or public injury exists during construction. Paynesville Wind and its construction representatives and workers will prepare and implement work plans and specifications in accordance with applicable worker safety requirements during construction of the Project. Paynesville Wind will also control public access to the Project during construction and operation. Paynesville Wind will provide security during construction and operation of the project, including fencing, warning signs, and locks on equipment and facilities (site permit section 7.15).

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[78] *Id*. at 5-14 and 5-15.
[79] Mayo: Turbines do not hamper medical helicopters, Rochester Post-Bulletin, May 18, 2010, http://www.postbulletin.com/newsmanager/templates/localnews_story.asp?z=2&a=452955.
[80] Exhibit 24.
[81] *Id*.
[82] Exhibit 22 (Applicant's post-hearing comments).

58. Each turbine will be clearly labeled to identify each unit and a map of the site with the labeling system will be provided to local authorities as part of the emergency response plan (site permit sections 7.17 and 7.16).

59. Possible health effects associated with wind turbines and transmission of electricity generally include those from electric and magnetic fields (EMF). The term EMF refers to electric and magnetic fields that are present around electrical devices. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection (feeder) lines, substation transformers, house wiring and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (transmission line wire).

60. The Applicant believes that the Project will not have any impact on public health and safety due to EMFs.[83] While there is no conclusive evidence that EMFs from power lines and wind turbines pose a significant health impact, turbines will be installed no closer than 750 to 1,000 feet from residences, where EMFs are expected to be at background levels. Based on the most current research on EMFs, and the distance between any turbines or collector lines and homes, the proposed Project is not anticipated to have significant impact to public health and safety due to EMFs. As referenced in Finding 21, the 69 kV transmission line will be permitted locally.

61. One person expressed concern about the effect of stray voltage on their dairy operations.[84] Stray voltage is an extraneous voltage that appears on grounded surfaces in buildings, barns and other structures. Stray voltage can be a problem for hospitals, manufacturing plants and farms. In hospitals and manufacturing plants, stray voltage may interfere with sensitive electronic equipment. On the farm, if this voltage reaches sufficient levels, animals coming into contact with grounded surfaces may receive a mild shock that can cause a behavioral response. Significant research on the effects of stray voltage on dairy cows has been conducted over the past 40 years. A comprehensive review of this research is presented in a report to the Ontario Energy Board (Literature Review and Synthesis of Research Findings on the Impact of Stray Voltage on Farm Operations, 2008, Prepared by Douglas J. Reinemann, Ph.D.). Stray voltage and its impact on dairy farms is normally an issue associated with electrical distribution lines and is a condition that can exist between the neutral wire of a service entrance and grounded objects in buildings. The source of stray voltage is a voltage that is developed on the grounded neutral wiring network of a farm and/or the electric power distribution system. The direct effect of animal contact with electrical voltage and the resulting current flowing through their bodies can range from mild behavioral reactions to intense behavioral responses indicative of pain. The indirect effects of these behaviors can vary considerably depending on the specifics of the contact location, level of current, pathway, frequency, and other factors related to the daily activities of the animals.

[83] *Id*. at 5-16.
[84] Exhibit 20 at 7.

62. The quality of the farm wiring system has the largest single influence on voltage exposure levels. Stray voltage sources can be reduced in three fundamental ways: 1) reduce the current flow on the neutral system, 2) reduce the resistance of the neutral system, or 3) improve the grounding of the neutral system. The electrical collection system proposed for the Project is designed to be "a separately derived system" as defined in the National Electric Code. The system will have no direct electrical connection (including grounded circuit conductors) to conductors originating in another system. The Applicant stated it is committed to siting turbines and transmission lines to avoid conflicts with dairy farms in the Project area.[85]

63. In winter months ice may accumulate on the wind turbine blades when the turbines are stopped or operating very slowly. Furthermore, the anemometer may ice up at the same time, causing the turbine to shut down during any icing event. As weather conditions change, any ice will normally drop off the blades in relatively small pieces before the turbines resume operation. This is due to flexing of the blades and the blades' smooth surface. Although turbine icing is an infrequent event (2.5 days per year), it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines during the winter months. The turbine setbacks from residences and roads will minimize impacts from ice throw (see sections 4.2 and 4.4 of the site permit).

Public Services and Infrastructure

64. The proposed Project is expected to have minimal effects on existing public infrastructure. The proposed Project would not generate an increase in traffic volumes or daily human activity, except for a short period of time during construction and occasionally during operation and maintenance activities. The construction contractor will repair any road damage that may occur during the construction of the Project (see site permit section 7.8).

65. Other than short-term impacts, no significant permanent changes in road traffic patterns or volume are expected. The busiest traffic would occur when the majority of the foundation and tower assembly is taking place. Township and county officials will receive advance notice of the construction schedule at the pre-construction meeting, including the timing of the delivery of towers and turbines and arrival of the crane to erect project equipment (site permit section 5.6). Paynesville Wind will work with all parties involved to address concerns related to roadway use, and adhere to state, county, and township requirements for transportation infrastructure.

66. Construction of the proposed Project requires the addition of access roads that will be located on private property. Access roads would be built adjacent to the turbine towers, allowing access both during and after construction. The access roads will be sited in consultation with local landowners and completed in accordance with specified design requirements, and will be located to facilitate both construction (e.g., cranes) and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. Roads may include appropriate drainage and culverts while

[85] Exhibit 1 at 5-20.

still allowing for the crossing of farm equipment. The permanent access roads would comprise approximately nine miles.[86] Permanent access roads will be approximately 16 to 33 feet wide, depending on turbine selection.[87] Local requirements would be followed wherever access roads join state or local roadways. During construction only, temporary access roads will be approximately 40 feet wide to accommodate delivery of turbines, towers, and other related equipment.[88] The Applicant estimated there will be up to 75 large truck trips per day and up to 175 small-vehicle trips per day during peak construction periods.[89] If 100 meter towers are used, an additional 66 trips in total will be necessary to accommodate the towers.[90] Once construction is completed, roads will be re-graded, filled, and dressed as needed.

67. If access roads are installed across streams or drainage ways, the Applicant, in consultation with Minnesota Department of Natural Resources, will design and locate the roads so the original water flow or drainage patterns are not altered. Any work required below the ordinary high water line, such as road crossings or culvert installation, will require a permit from Minnesota Department of Natural Resources. See section 10.5 of the site permit for a list of other permits that may be required.

68. There are three existing 69 kV high-voltage transmission lines that cross the Project area.[91]

69. The proposed Project will have approximately 44 miles of underground 34.5 kV electrical collector lines within the Project area.[92] Generally, the underground lines will be laid in trenches and installed along the edge of farm fields.[93] The collection lines will occasionally require an above ground junction box.[94] Placement of collector and feeder lines is addressed in the site permit at section 4.15.

70. Prior to construction, Gopher State One Call will be contacted to locate underground facilities so they can be avoided. Further, section 7.15 of the site permit requires the Applicant to submit the location of all its underground cables and collector and feeder lines to Gopher State One Call. To the extent Project facilities cross or otherwise affect existing telephone lines or equipment, Paynesville Wind will make arrangements with applicable service providers to avoid interference with such facilities.

71. The presence or operation of the Project could potentially impact the quality of television and radio reception in the area. Previous analysis on television reception issues indicates that in some cases new antennas or relocation of existing antennas can restore television signal strength reception. There are two active microwave beam paths in the Project

[86] Exhibit 25.
[87] Exhibit 1 at 4-4.
[88] *Id*.
[89] *Id*. at 4-5.
[90] Exihibit 22 (pre-hearing comments).
[91] Exhibit 1 at 5-8.
[92] *Id*. at 1
[93] *Id*. at 4-3.
[94] *Id*.

area.[95] The Applicant stated its setback from microwave beam paths is equal to the blade length from the fresnell zone.[96] The Applicant will not operate the wind farm so as to cause microwave, radio, telecommunications, television, or navigation interference in violation of Federal Communications Commission regulations or other applicable law. If operation of the Project causes such interference, Paynesville Wind will take steps necessary to correct the problem. Section 6.4 of the site permit requires the Applicant to submit a plan to conduct an assessment of television and radio signal reception, microwave signal patterns, and telecommunications in the Project area. Section 4.15 of the site permit requires the Applicant to comply with all Institute of Electrical and Electronics Engineers, Inc. standards.

72. Construction, operation, and maintenance of the proposed Project will comply with all of the required federal, state, and local permit requirements. See section 10.5 of the site permit.

Recreational Resources

73. There are four Wildlife Management Areas (WMAs) adjacent to the Project area and 10 WMAs located within five miles of the Project area. WMAs are managed to provide wildlife habitat, improve wildlife production, and provide public hunting. The four adjacent WMAs are: Zion WMA, Salem Community Prairie WMA, Miller Spring Lea Farm WMA, and the Spirit Prairie WMA. The Roseville WMA is located 0.5 miles from the Project boundary. The WMAs are shown in the constraint maps at Exhibit 25. Section 4.5 of the site permit requires that a setback of three RD in the non-prevailing wind direction and five RD in the prevailing wind direction from all WMAs.

74. The Bauman Waterfoul Production Area (WPA) is located within the Project area.[97] The Lake Henry WPA and the Zion WPA are adjacent to the Project. There are four WPAs located within five miles of the Project. The WPAs are shown on the constraint maps at Exhibit 25. WPAs are managed to protect habitat used for breeding, foraging, shelter, and migration for waterfowl. Section 4.5 of the site permit requires that a setback of three RD in the non-prevailing wind direction and five RD in the prevailing wind direction from all WPAs.

75. There is one Scientific and Natural Area (SNA) located within five miles of the Project. The Roscoe Prairie SNA is located approximately 1.25 miles from the Project Area.[98] SNAs are designated areas to protect rare and endangered species habitat, unique plant communities, and significant geologic features. This SNA is located well beyond the setbacks required in the site permit.

76. Lake Henry is located approximately one half mile west of the Project area. Lakes in the area are used for recreational boating and fishing.[99] Spring Hill County Park is located

[95] *Id.* at 5-9.
[96] Exhibit 25.
[97] Exhibit *1* at 5-13 (note that the application excludes this WPA from the Project, but it is within the exterior boundaries).
[98] *Id.*
[99] *Id*.

one mile north of the Project area.[100] These features are located well beyond the setbacks required in the site permit.

77. Glacial Lakes State Trail crosses the southern portion of the Project area along the former Burlington Northern Railroad and is open for hiking, horseback riding and biking.[101] The site permit does not provide for a setback to this trail. Preliminary turbine layouts included in the site permit show turbines show a setback of at least one mile and will likely be at least five RD from the trail. The electrical collection system will have to cross the Glacial Lakes State Trail in order to deliver power to the Paynesville Substation. Section 13.1.1 of the site permit requires the line to be buried underground. Section 10.5 of the site permit addresses other permits that may be required.

78. The Project area has a grant-in-aid snowmobile trail that runs through the center of the Project. The site permit does not provide a setback to this trail because the trail is located on private property and its location can vary from year to year. However, preliminary turbine layouts indicate no turbines located within 250 feet of the current trail location. The Applicant will take into consideration the location of known snowmobile trails during the final siting of the turbines.

Community Benefits

79. Paynesville Wind will pay a Wind Energy Production Tax to the county and townships each year, which is expected to be approximately $350,000 to $450,000 per year.[102] If 100 meter towers are used, the Applicant anticipates that an additional 10 to 15 percent in production tax revenue would be raised.[103] Landowners with wind turbines on their property will also receive payments from the Applicant. The Project is expected to create new job opportunities within the local community, both during construction and operation.

Effects on Land-Based Economies

80. The Project area includes 12,401 acres of cultivated agricultural land.[104] The turbines and associated facilities are expected to occupy between 31 and 48 acres of agricultural land.[105] A typical turbine will permanently displace approximately 0.5 to 1.0 acre of agricultural land. The Project substation will requires less than one acre of land.[106] The Applicant has stated it will repair drain tile damage in accordance with specific landowner agreements.[107] The application did not address the total number of acres that would be temporarily impacted due to construction activities associated with the Project (e.g., grading, soil compaction, access roads, turn around areas, and temporary construction staging areas). Overall, impact to agricultural lands as a result of the Project is anticipated to be short term, and is not expected to alter crop production. Once in

[100] *Id*.
[101] *Id*.
[102] *Id*. at 5-2.
[103] Exhibit 22 (pre-hearing comments at 3).
[104] Exhibit 1 at 5-18 – 5-19.
[105] *Id*. at 3-1.
[106] *Id*. at 2-4.
[107] *Id*. at 5-19.

operation, it may occasionally be necessary for Paynesville Wind to complete repairs, or clear vegetation around a turbine or facility, which could result in additional temporary impacts to agricultural operations. These interruptions are expected to be infrequent and short term. Section 7 of the site permit addresses mitigation measures for agricultural lands.

81. The Applicant has determined that there are no gravel pits within the Project area.[108] However, there are seven active gravel mines, three inactive gravel mines, and two active aggregate mines located less than five miles of the Project area.[109] The proposed Project does not adversely affect any sand or gravel operations.

82. Paynesville Wind will avoid impacts to Reinvest in Minnesota (RIM) land and will minimize impacts to Conservation Reserve Program (CRP) land.[110] If CRP land is impacted, the Applicant will work with the landowner to remove the impacted portion of the parcel from the CRP program.[111] RIM land has not been identified within the Project area. Section 6.1 of the site permit requires certain inventories to be conducted of potentially impacted land. Therefore, CRP or additional RIM land would be identified if potentially impacted.

Property Values

83. Several residents expressed concern over the impact of the Project on property values.[112] A study conducted by the Lawrence Berkley National Laboratory found an absence of negative impacts to property values from wind farms within a project view shed.[113] On June 1, 2010, the Stearns County Assessor's Office prepared "A Study of Wind Energy Conversion System in Minnesota," which did not find any changes in property valuation to properties hosting a wind tower based on information provided by assessors from Dodge, Jackson, Lincoln, Martin, Mower, and Murray counties.[114] However, the study acknowledged that there is insufficient data to allow for a reasonable analysis of the development of wind facilities on property values. The Stearns County study also cited studies completed by the Renewable Energy Policy Project, which analyzed 25,000 sales inside and outside of view sheds of a wind facility and concluded that property values appear not be affected, and a study conducted by the Royal Institute of Chartered Surveyors, which examined the impact of wind facilities on property values in the United Kingdom and found that almost 30 percent of the respondents reported a decrease in property values.

[108] *Id*.
[109] *Id*. at 5-23.
[110] *Id*. at 5-20.
[111] *Id*. at 5-20.
[112] Exhibit 20.
[113] Ben Hoen et al., *The Impact of Wind Power Projects on Residential Property Values in the United States*, Lawrence Berkeley National Laboratory (Dec. 2009).
[114] Exhibit 22 (Applicant's July comments).

Archaeological and Historical Resources

84. A review of the Minnesota State Historic Preservation Office (SHPO) computer database and nineteenth century Public Land Survey maps identified one archeological site within the data-gathering area, which is represented by a small lithic scatter.[115] An expanded search area revealed 10 additional sites of a similar nature.[116] Two rural schools, a church, and a rail related facility have been identified within the Project area.[117]

85. An archaeological survey is recommended for all the proposed turbine locations, access roads, junction boxes, and other areas of Project construction impact to document any previously unrecorded archaeological sites within the Project site. Section 6.3 of the site permit requires the Applicant to conduct an archaeological reconnaissance survey (Phase I or Phase IA). An archaeological reconnaissance survey is used to determine if archaeological sites exist within the area or are potentially affected by the Project through literature review and, if warranted, field review including visual inspection and sampling. Depending upon the results of the reconnaissance survey, more detailed work may be necessary. The Applicant has not yet begun its Phase I or 1A survey at the time the Applicant submitted its site permit application.[118]

86. If archaeological sites are found during the Phase I survey, their integrity and significance should be addressed in terms of the site's potential eligibility for placement on the National Register of Historic Places (NRHP). If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with the SHPO, the State Archaeologist, and consulting American Indian communities. Section 6.3 of the site permit also requires the Applicant to stop work and notify the SHPO and the Commission if any unrecorded cultural resources are found during construction.

Air and Water Emissions

87. No harmful air or water emissions are expected from the construction and operation of the Project.

Wildlife

88. More than 80 percent of the Project area is used for agricultural purposes, primarily row cropping with some hay and pasture lands.[119] Bauman Waterfowl Production Area is within the Project area and six other WMAs and WPAs are adjacent to the Project boundary. See Findings 73 and 74 for additional information on WMAs and WPAs. The Project will have direct and indirect impacts on birds, bats, and other wildlife resources and their habitats. Direct impacts may include strike fatality from turbine blades, the 69 kV transmission line (which will be permitted locally), and related infrastructure.

[115] Exhibit 1 at 5-10.
[116] *Id*. at 5-10 and 5-11.
[117] *Id*. at 5-11.
[118] *Id*. at 5-12.
[119] *Id*. at 5-27.

Indirect impacts may include displacement of birds and bats and other wildlife from their habitats, site avoidance, and behavioral modification.

89. The United States Fish and Wildlife Service (USFWS) developed Draft Guidelines for Wind Turbine Siting in 2010. The guidelines provide wind developers and regulatory agencies with the information needed to identify, assess, and monitor the potentially adverse impacts of wind energy projects on wildlife and their habitats, particularly migratory birds and bats. The guidelines focus on a tiered approach to gathering information on a site and potential risks to wildlife and wildlife habitat. Depending on the results obtained from each tier, pre-and/or post-construction survey work and mitigative measures are recommended.

90. The Applicant hired Hamer Environmental, L.P. (Hamer) to conduct pre-construction avian and bat surveys consistent with the USFWS tiered approach, which were conducted in 2009 and 2010.[120] Results of the surveys indicate high levels of waterfowl and waterbirds within the Project area. Clear flights paths between natural features, such as WPAs and WPAs, were not evident.

91. Survey results analyzed flight data of species in the Zone of Risk (ZOR), which is the probable wind rotor plane of a typical wind turbine. Twenty-four percent of raptors (of 135 birds), 20 percent of waterbirds (of 272 birds), and 72 percent of waterfowl (of 1,092 birds) flew through the ZOR.[121]

92. Addendum A (Exhibit 26) addressed the impacts of 100 meter towers on birds. In general, raptors, waterbirds and waterfowl identified in Finding 91 would be less impacted by a higher rotor swept area.[122] However, migrating songbirds could be at increased risk with a higher rotor swept area because nocturnal migration has been known to occur as low as 150 meters.[123] The Siemens turbine would be 150.5 meters tall with the blade vertical position as discussed in Finding 22. Therefore, the Siemens turbine could impact migration on 100 meter towers. Section 4.9 of the site permit allows for the option of using 100 meter towers.

93. Due to the higher than expected bird activity in the Project area and numerous WMAs and WPAs adjacent to the site boundary (see Findings 73 and 74), Hamer recommended post-construction monitoring with additional mitigation measures implemented if necessary. Section 13.2 requires the Applicant to conduct a minimum of one year of post-construction avian and bat fatality surveys.

94. The results of acoustic bat studies, conducted by Hamer in 2009 and 2010, conclude that bat activity on the site is higher than expected and greater than what was recorded at Buffalo Ridge.[124] Based on the results, Hamer recommended post-construction surveys using pre-established protocols with additional mitigation measures implemented as

[120] *See* exhibit 26.
[121] Exhibit 26 at 14.
[122] Exhibit 26 (Addendum A).
[123] See exhibit 27.
[124] *See* exhibit 26.

necessary. Section 13.2 requires the Applicant to conduct a minimum of one year of post-construction avian and bat fatality surveys.

95. Recent studies indicate a broad range of avian and bat fatalities across the United States as a result of wind development, with the highest fatalities occurring in the eastern United States. In the Midwest, post-construction studies completed in Iowa, Minnesota, and Wisconsin confirm a broad range of fatalities. The highest bird and bat fatalities were found at the 145 MW Blue Sky Green Field wind facility in Wisconsin, which had bird fatalities at 12 birds per turbine per year and bat fatalities at 40 bats per turbine per year.[125] Fatalities range from one to four birds per turbine per year and from one to eight bats per turbine per year across most of the upper Midwest. Avian and bat studies conducted at the Buffalo Ridge, Minnesota, found an average of one to four bird fatalities per turbine per year and one to three bat fatalities per turbine per year. Projects in areas with similar habitat and cover types would likely have similar fatality rates, depending on migration patterns, known resting and foraging areas, and potential for bat hibernacula. However, as wind facilities increase and move into areas or landscapes where migration or use patterns are less understood, it becomes increasingly difficult to make landscape level comparisons between facilities and predict the impacts on avian and bat populations.

96. Section 6.7 of the site permit requires the Applicant to prepare an Avian and Bat Protection Plan, submit quarterly avian and bat reports, and report dead or injured avian and bats species under certain conditions. The DNR requested that the Avian and Bat Protection Plan specifically address steps to minimize impacts to breeding birds during the construction phase. Section 6.7 requires the Applicant to work with the Commission and the DNR in preparation of the plan; therefore, this request can be accommodated in that process. Additionally, USFWS expressed concern regarding proximity of turbines to WPAs (see Finding 74). These concerns can also be addressed in the Avian and Bat Protection Plan.

97. Section 6.1 requires the Applicant to conduct pre-construction desktop and field inventories of potentially impacted, if any, native prairies, wetlands, and any other biologically sensitive areas within the site and assess the presence of state threatened, endangered, or species of special concern or federally listed species. Section 4.5 requires that turbines and associated facilities will not be constructed in wildlife management areas, waterfowl production areas, or parks and a setback of five rotor diameter in the prevailing wind and three rotor diameter in the non-prevailing wind is applied to such public lands, which would minimize impacts to wildlife that utilize those public lands.

Rare and Unique Natural Resources

98. According to Natural Heritage Information System (NHIS) data, there are 21 recorded occurrences of special status species, plant communities, or other unique natural features within a one-mile radius of the Project area.[126] These recorded occurrences include eight

[125] West, Inc., *Post-Construction Bat and Bird Fatality Study at the Blue Sky Green Field Wind Energy Center, Fond du Lac County, Wisconsin* (December 17, 2009).
[126] Exhibit 1 at 5-34 and Appendix A.

rare species or native plant communities. Rare species include the Upland Sandpiper, small white Lady's slipper, Wilson's phalarope, Marbled Godwit, Bald Eagle, and regal fritillary. Native plant communities include Southern Mesic Prairie and Southern Wet Prairie.

99. Four species of birds listed for conservation in Minnesota were identified within the Project area in the Applicant's pre-construction avian survey (see Exhibit 26) and are listed in the table below:

Type of Bird	**State Conservation Status**
Trumpeter Swan	Threatened
American White Pelican	Special Concern
Franklin's Gull	Special Concern
Bald Eagle	Special Concern

100. Survey results found 100 percent of American White Pelicans (of 26 birds), 67 percent of Bald Eagles (of 6 birds), 50 percent of either Tundra or Trumpeter Swan (of 157 birds total), and 4.9 percent of Franklin's Gull (of 201 birds) flew through the ZOR.[127]

101. As discussed in Finding 96 the Applicant will prepare an Avian and Bat Protection Plan, which will address rare and unique species. Further, Section 4.7 of the site permit requires a Prairie Protection and Management Plan if native prairie is identified in the surveys required under Section 6.1 of the site permit.

Vegetation

102. No public waters, wetlands, or forested land are expected to be adversely affected by the Project. No groves of trees or shelterbelts will need to be removed to construct and operate the system. Native prairie will also be avoided. Section 4.7 of the site permit will require a prairie protection and management plan if native prairie is discovered in the biological and natural resource inventories required in section 6.1 of the site permit.

Soils

103. The site permit has requirements to implement sound water and soil conservation practices during construction and operation of the Project in order to protect topsoil and adjacent resources and to minimize soil erosion. The Project will be subject to the requirements of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) stormwater permit for construction activity. An erosion and sediment control plan and Storm Water Pollution Prevention Plan (SWPPP) will also be prepared for the Project and the disturbed areas will be seeded after construction to stabilize the area (site permit section 7.11).

Geologic and Ground Water Resources

[127] Exhibit 26 at 14.

104. The Project area is relatively flat and mostly tiled farmland. Turbines will be located on topographically elevated uplands and are not expected to affect streams, surface water bodies or floodplains. The Project area is served by an extensive network of state, county, and township roads, which will provide site access and egress. There are 21 domestic, three irrigation, one scientific, and two unknown wells within the Project area.[128] Based on the proposed site layouts, no impacts to streams, wetlands, floodplains, or shorelands are anticipated. Impacts to geologic and groundwater resources are not anticipated. Section 13.1.2 of the site permit prohibits siting turbines in shoreland districts identified by Stearns County. Exhibit 25 shows shoreland districts on constraint maps.

Surface Water and Wetlands

105. Wind turbines and associated facilities will not be located in public water wetlands, except that collector and feeder lines may cross if authorized by the appropriate permitting agency (site permit section 4.6). A permit may be required if surface waters are impacted (see section 10.5.1 of the site permit). There are a total of 784 acres of National Wetland Inventory (NWI) wetland types in the Project area.[129] Of the wetlands, 712 acres are freshwater emergent wetlands, 50 acres are freshwater forested/shrub wetlands, and 12 acres are freshwater pond wetlands.[130] There are also 35.54 acres of Public Waters Inventory (PWI) wetlands; however, there may be some overlap between NWI and PWI wetlands.[131] A wetland delineation report will be completed to determine all wetland boundaries adjacent to areas of proposed turbine locations and the layout will be designed to avoid and minimize wetland impacts.[132] If wetland impacts cannot be avoided, the Applicant must apply for the applicable permits from the U.S. Army Corps of Engineers (see section 10.5 of the site permit regarding other permits or requirements).

Future Development and Expansion

106. Current information suggests windy areas in this part of the state are large enough to accommodate more wind facilities. In addition to existing wind projects, the future will likely bring Stearns County and surrounding counties additional types and sizes of wind projects supplied by different vendors and installed at different times. The Applicant has indicated that it is considering Stearns County for future development, but if such a project is proposed, a separate site permit would have to be obtained in order to construct the project.

107. While large-scale projects have occurred elsewhere (Texas, Iowa, and California), little systematic study of the cumulative impact has occurred. Research on the total impact of many different projects in one area has not occurred. OES EFP staff will continue to monitor for impacts and issues related to wind energy development.

[128] Exhibit 1 at 5-23.
[129] *Id.* at 5-25.
[130] *Id.*
[131] *Id.*
[132] *Id.* at 5-26.

108. The Commission is responsible for siting of LWECS "in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources."[133] Section 4.1 of the site permit provides for buffers between adjacent wind generation projects to protect wind production potential.

Maintenance

109. Maintenance of the turbines will be on a scheduled, rotating basis with one or more units normally off for maintenance each day, if necessary. Maintenance on the interconnection points will be scheduled for low wind periods. Paynesville Wind will have on-site service and maintenance activities, including routine inspections, regular preventive maintenance, unscheduled maintenance and repair, and routine minor maintenance on the wind turbines and associated facilities. The operations and maintenance facility will be permitted by Stearns County.

Decommissioning and Restoration

110. The existing easement agreements between the Applicant and landowners provide for decommissioning of turbines.[134] These agreements also require all foundations be removed to a depth of four feet below grade and buried back to grade.[135] Section 9.2 of the site permit requires removal of wind facilities to a depth of four feet and restoration and reclamation of the site to the extent feasible. The Applicant has agreed to meet all of the requirements of the Stearns County Solid Waste Ordinance for site restoration. The Project site would be restored within 18 months after Project expiration.

111. Decommissioning activities will include: (1) removal of all wind turbine components and towers; (2) removal of all pad mounted transformers; (3) removal of overhead and underground cables and lines; (4) removal of foundations; and (5) removal of surface road material and restoration of the roads and turbine sites to previous conditions to the extent feasible.

112. As provided in section 9.1 of the site permit, the Applicant will ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. Section 9.1 requires the applicant to submit a Decommissioning Plan to the Commission prior to the pre-operation compliance meeting. In addition to any requirements under the site permit, each individual land lease requires proper decommissioning of turbines. The Applicant will be responsible for costs to decommission the Project and associated facilities.

113. **Relationship to Stearns County Wind Energy Conversion Systems Ordinance (November 17, 2009)**

Minn. Stat. § 216F.081 states:

[133] Minn. Stat. § 216F.03.
[134] Exhibit 1 at 4-10.
[135] *Id*. at 4-11.

> A county may adopt by ordinance standards for LWECS that are more stringent than standards in commission rules or in the commission's permit standards. The commission, in considering a permit application for LWECS in a county that has adopted more stringent standards, shall consider and apply those more stringent standards, unless the commission finds good cause not to apply the standards.

The Commission finds that six provisions of Stearns County Wind Energy Conversion Systems Ordinance (November 17, 2009) establish standards that are "more stringent" than the Commission has generally required heretofore with respect to the LWECS it regulates. The Stearns County Ordinance adopts more stringent standards with respect to six subjects: 1) project boundary setbacks; 2) road right-of-way setbacks; 3) internal turbine spacing; 4) feeder line placement; 5) requirement of undergrounding in the Shoreland Overlay District; and 6) property line setbacks.

With regard to all but one of these requirements, however, either the Applicant has affirmatively agreed to abide by the more stringent standard or the County has affirmatively agreed, based on the facts of the case, that the Ordinance's more stringent standard should not be applied.

- **Applicant's Agreement to Abide:** With respect to the ordinance's more stringent feeder line placement requirement and undergrounding requirement for the Shoreland Overlay District, the Applicant has agreed to these requirements and they will be made part of the Site Permit at Section 13.11 and Section 13.1.1, respectively.

- **County Board's Decision to Modify**: With respect to the Ordinance's more stringent project boundary setbacks, road right-of-way setback, and internal turbine spacing requirement, based on its review of the particular circumstances of this case, the County Board has modified those requirements with respect to the Applicant's project to be consistent with the Commission's.

As a consequence, with respect to these five requirements, the Commission need not determine whether there is "good cause" not to apply those standards.

Having considered the Ordinance's remaining more stringent requirement (property line setback of 1.1 times the total turbine height), the Commission finds good cause not to apply that requirement based on the following circumstances.

- First, the OES advises that the risk of a turbine falling is very small and that only one turbine is known to have fallen in the United States. Based on this

assessment of risk, the OES does not support the Ordinance's property line setback.

- Second, the Applicant has a provision in its standard wind easement to address catastrophic failure, including turbine collapse.

- Third, the Stearns County Board, which has commented extensively on other aspects of the Project, has not identified the absence of its Ordinance's property line setback requirement from the draft Site Permit as a concern.

See Finding of Fact 39, above, which is consistent with these findings.

Site Permit Conditions

114. All of the above findings pertain to the Applicant's requested permit for a 95 MW LWECS project.

115. Most of the conditions contained in the site permit were established as part of the site permit proceedings of other wind turbine projects permitted by the Environmental Quality Board and the Public Utilities Commission. Comments received by the Commission have been considered in development of the site permit. Minor changes and special condition additions that provide clarification or additional requirements have been made.

116. The site permit contains conditions that apply to site preparation, construction, cleanup, restoration, operation, maintenance, abandonment, decommissioning, and all other aspects of the Project.

Based on the foregoing findings, the Minnesota Public Utilities Commission makes the following:

CONCLUSIONS OF LAW

1. Any of the foregoing findings, which more properly should be designated as conclusions, are hereby adopted as such.

2. The Minnesota Public Utilities Commission has jurisdiction over this matter pursuant to Minnesota Statutes section 216F.04.

3. The Applicant has substantially complied with the procedural requirements of Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854.

4. The Minnesota Public Utilities Commission has complied with all procedural requirements required of Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854.

5. The Minnesota Public Utilities Commission has considered all the pertinent factors relative to its determination of whether a site permit should be approved.

6. The Paynesville Wind Farm is compatible with the policy of the state to site LWECS in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources under Minnesota Statutes section 216F.03.

7. The Minnesota Public Utilities Commission has the authority under section 216F.04 to place conditions in a permit and may deny, modify, suspend, or revoke a permit. The conditions in the site permit are reasonable and appropriate.

Based on the foregoing Findings of Fact and Conclusions of Law, the Minnesota Public Utilities Commission issues the following:

ORDER

A LWECS Site Permit is hereby issued to Paynesville Wind, LLC to construct and operate the up to 95 MW Paynesville Wind Farm in Stearns County in accordance with the conditions contained in the site permit and in compliance with the requirements of Minnesota Statutes section 216F.04 and Minnesota Rules chapter 7854 for PUC Docket No. IP-6830/WS-10-49.

The site permit is attached hereto, with maps showing the approved site and preliminary turbine layouts.

BY THR ORDER OF THE COMMISSION

Burl W. Haar
Executive Secretary

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STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

SITE PERMIT FOR A LARGE WIND ENERGY CONVERSION SYSTEM

IN STEARNS COUNTY

ISSUED TO PAYNESVILLE WIND, LLC

PUC DOCKET NO. IP-6830/WS-10-49

In accordance with Minnesota Statutes section 216F.04 this site permit is hereby issued to:

Paynesville Wind, LLC

Paynesville Wind, LLC is authorized to construct and operate up to a 95 Megawatt Large Wind Energy Conversion System on the site identified in this site permit and in compliance with the conditions contained in this permit.

This permit shall expire thirty (30) years from the date of this approval.

Approved and adopted this 26th day of January, 2011

BY ORDER OF THE COMMISSION

BURL W. HAAR
Executive Secretary

This document can be made available in alternative formats (i.e., large print or audio) by calling 651-296-0406 (voice). Persons with hearing or speech disabilities may call us through Minnesota Relay at 1-800-627-3529 or by dialing 711.

Table of Contents

SITE PERMIT

This **SITE PERMIT** for a Large Wind Energy Conversion System (LWECS) authorizes Paynesville Wind, LLC ("Permittee") to construct and operate the Paynesville Wind Farm ("Project"), up to a 95 Megawatt (MW) nameplate capacity LWECS and associated facilities in Stearns County, on a site of approximately 15,000 acres in accordance with the conditions contained in this permit.

SECTION 1
PROJECT DESCRIPTION

The up to 95 MW nameplate capacity LWECS authorized to be constructed in this permit will be developed and constructed by the Permittee. The Project will consist of up to 60 General Electric (GE) 1.6 MW wind turbine generators on either 262.5 foot (80 meter) or 328 foot (100 meter) towers with a rotor diameter of 270 feet (82.5 meters), up to 53 Vestas 1.8 MW wind turbine generators on either 262.5 foot (80 meter) or 328 foot (100 meter) towers with a rotor diameter of 295 feet (90 meters), or up to 42 Siemens 2.3 MW wind turbine generators on 262.5 foot (80 meter) towers with a rotor diameter of 331 feet (101 meters) having a combined nominal nameplate capacity of approximately 95 MW. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection system, feeder or collector lines, a permanent meteorological tower, a Sonic Detection and Ranging unit or Light Detection Ranging unit, a project substation, and possibly a metering yard. Power will ultimately be delivered to the existing Paynesville Substation.

SECTION 2
DESIGNATED SITE

2.1 PROJECT BOUNDARY

The Project boundary is shown on the map at Attachment 1**.** The Project is located in Stearns County, in the townships of Paynesville (section 5), Zion (sections 4-9, 16-22, 29-32), Spring Hill (section 36), and Lake Henry (sections 1, 11-13, 22-27).

2.2 TURBINE LAYOUT

Three preliminary wind turbine and associated facility layouts are shown on maps at Attachments 1A, 1B, and 1C. Each preliminary layout represents the approximate location of wind turbines and associated facilities within the Project boundary and identifies a layout that minimizes the overall potential human and environmental impacts, which were evaluated in the permitting process. The final layout depicting the location of each wind turbine and associated facility shall be located within the Project boundary. The Project boundary serves to provide the Permittee with the flexibility to do minor adjustments to the preliminary layout to accommodate landowner requests, unforeseen conditions encountered during the detailed engineering and design process, and federal and state agency requirements. Any modification of the location of a wind turbine and associated facility depicted in a preliminary layout shall be done in such a manner as to have comparable overall human and environmental impacts and shall be

specifically identified in the site plan pursuant to Section 5.1. The Permittee shall submit the final site layout in the site plan pursuant to Section 5.1.

SECTION 3
APPLICATION COMPLIANCE

The Permittee shall comply with those practices set forth in its site permit application, dated January 29, 2010, and the record of this proceeding unless this permit establishes a different requirement in which case this permit shall prevail.

SECTION 4
SETBACKS AND SITE LAYOUT RESTRICTIONS

4.1 WIND ACCESS BUFFER

Wind turbine towers shall not be placed less than five (5) rotor diameters (RD) on the prevailing wind directions and three (3) RD on the non-prevailing wind directions from the perimeter of the property where the Permittee does not hold the wind rights, without the approval of the Commission. This section does not apply to public roads and trails.

4.2 RESIDENCES

Wind turbine towers shall not be located closer than 1,000 feet from residences unless a waiver has been signed by the property owner(s) or the distance required to comply with the noise standards pursuant to Minnesota Rule 7030.0040 established by the PCA, whichever is greater. In no case shall a wind turbine be located closer than 750 feet to a residence.

4.3 NOISE

The wind turbine towers shall be placed such that the Permittee shall comply with noise standards established as of the date of this permit by the PCA at all times at all appropriate locations. The noise standards are found in Minnesota Rules chapter 7030. Turbine operation shall be modified or turbines shall be removed from service if necessary to comply with these noise standards. The Permittee or its contractor may install and operate turbines as close as the minimum setback required in this permit, but in all cases shall comply with PCA noise standards. The Permittee shall be required to comply with this condition with respect to all homes or other receptors in place as of the time of construction, but not with respect to such receptors built after construction of the towers.

4.4 ROADS

Wind turbine and meteorological towers shall not be located closer than 250 feet from the tip of the blade to the edge of the nearest public road right-of-way.

4.5 PUBLIC LANDS

Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be located in public lands, including Waterfowl Production Areas, Wildlife Management Areas, Scientific and Natural Areas or county parks, and wind turbine towers shall also comply with the setbacks of Section 4.1.

4.6 WETLANDS

Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be placed in public waters wetlands, as defined in Minnesota Statutes section 103G.005, subdivision 15a, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and approvals by the Minnesota Department of Natural Resources (DNR) and the United States Army Corps of Engineers (USACE).

4.7 NATIVE PRAIRIE

Wind turbines and associated facilities, including foundations, access roads, collector and feeder lines, underground cable, and transformers, shall not be placed in native prairie, as defined in Minnesota Statutes section 84.02, subdivision 5, unless addressed in a prairie protection and management plan. The Permittee shall, in consultation with the Commission and DNR, prepare a Prairie Protection and Management Plan and submit it to the Commission and DNR at least ten (10) working days prior to the pre-construction meeting if native prairie is identified in any biological and natural resource inventories conducted pursuant to Section 6.1. The plan shall address steps taken to avoid impacts to native prairie and mitigation to unavoidable impacts to native prairie by restoration or management of other native prairie areas that are in degraded condition, by conveyance of conservation easements, or by other means agreed to by the Permittee and Commission. Wind turbines and associated facilities, including foundations, access roads, collector and feeder lines, underground cable, and transformers, shall not be located in areas enrolled in the Native Prairie Bank Program.

4.8 SAND AND GRAVEL OPERATIONS

Wind turbines and all associated facilities, including foundations, access roads, underground cable and transformers, shall not be located within active sand and gravel operations, unless otherwise negotiated with the landowner with notice given to the owner of the sand and gravel operation.

4.9 WIND TURBINE TOWERS

Structures for wind turbines shall be self-supporting tubular towers. The towers may be up to 100 meters (328 feet).

4.10 TURBINE SPACING

The turbine towers shall be constructed within the site boundary as shown in Attachment 1. The turbine towers shall be spaced no closer than three (3) RD in the non-prevailing wind directions and five (5) RD on the prevailing wind directions. If required during final micro-siting of the turbine towers to account for topographic conditions, up to 20 percent of the towers may be sited closer than the above spacing but the Permittee shall minimize the need to site the turbine towers closer.

4.11 METEOROLOGICAL TOWERS

Permanent towers for meteorological equipment shall be free standing. Permanent meteorological towers shall not be placed less than 250 feet from the edge of the nearest public road right-of-way and from the boundary of the Permittee's site control, or in compliance with the county ordinance regulating meteorological towers in the county the tower is built, whichever is more restrictive. Meteorological towers shall be placed on property the Permittee holds the wind or other development rights.

Meteorological towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the meteorological towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the wind monitoring equipment.

4.12 AVIATION

The Permittee shall not place wind turbines or associated facilities in a location that could create an obstruction to navigable airspace of public and private airports (as defined in Minnesota Rule 8800.0100, subparts 24a and 24b) in Minnesota, adjacent states, or provinces. The Permittee shall apply the minimum obstruction clearance for private airports pursuant to Minnesota Rule 8800.1900, subpart 5. Setbacks or other limitations shall be followed in accordance with the Minnesota Department of Transportation (DOT), Department of Aviation, and the FAA. The Permitee shall notify owners of all known airports within six (6) miles of the Project prior to construction.

4.13 FOOTPRINT MINIMIZATION

The Permittee shall design and construct the LWECS so as to minimize the amount of land that is impacted by the LWECS. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, step-up transformers, and monitoring systems shall, to the greatest extent feasible, be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner(s).

4.14 COMMUNICATION CABLES

The Permittee shall place all supervisory control and data acquisition (SCADA) communication cables underground and within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner(s).

4.15 ELECTRICAL COLLECTOR AND FEEDER LINES

Collector and feeder lines comprise the electrical collection system. Collector lines that carry electrical power from each individual transformer associated with a wind turbine to an internal project interconnection point shall be buried underground. Collector lines shall be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner(s).

Feeder lines that carry power from an internal project interconnection point to the Project substation or interconnection point on the electrical grid may be overhead or underground. Feeder line locations shall be negotiated with the affected landowner(s).

Any overhead feeder lines that parallel public roads shall be placed within the public rights-of-way or on private land immediately adjacent to public roads. If overhead feeder lines are located within public rights-of-way, the Permitee shall obtain approval from the governmental unit responsible for the affected right-of-way.

Collector and feeder line locations shall be located in such a manner as to minimize interference with agricultural operations including, but not limited, to existing drainage patterns, drain tile, future tiling plans, and ditches. Safety shields shall be placed on all guy wires associated with overhead feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 5.1.

The Permittee must fulfill, comply with, and satisfy all Institute of Electrical and Electronics Engineers, Inc. (IEEE) standards applicable to this Project including, but not limited to, IEEE 776 [Recommended Practice for Inductive Coordination of Electric Supply and Communication Lines], IEEE 519 [Harmonic Specifications], IEEE 367 [Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault], and IEEE 820 [Standard Telephone Loop Performance Characteristics] provided the telephone service provider(s) have complied with any obligations imposed on it pursuant to these standards. Upon request by the Commission, the Permittee shall report to the Commission on compliance with these standards.

SECTION 5
ADMINISTRATIVE COMPLIANCE PROCEDURES

The following administrative compliance procedures shall be executed in accordance with the Permit Compliance Filings at Attachments 3 and 4.

5.1 SITE PLAN

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission:

(a) a site plan for all turbines, roads, electrical equipment, collector and feeder lines, and other associated facilities to be constructed;

(b) engineering drawings for site preparation, construction of the facilities; and

(c) a plan for restoration of the site due to construction.

The Permittee may submit a site plan and engineering drawings for only a portion of the Project if the Permittee intends to commence construction on certain parts of the Project before completing the site plan and engineering drawings for other parts of the Project. The Permittee shall document, through GIS mapping, compliance with the setbacks and site layout restrictions required by this permit, including compliance with the noise standards pursuant to Minnesota Rules chapter 7030. In the event that previously unidentified environmental conditions are discovered during construction that by law or pursuant to conditions outlined in this permit would preclude the use of that site as a turbine site, the Permittee shall have the right to move or relocate turbine site. The Permittee shall notify the Commission of any turbines that are to be relocated before the turbine is constructed on the new site and demonstrate compliance with the setbacks and site layout restrictions required by this permit.

5.2 NOTICE TO LOCAL RESIDENTS

Within ten (10) working days of approval of this permit, the Permittee shall send a copy of the permit to the office of the auditor of each county in which the site is located and to the clerk of each city and township within the site boundaries. If applicable, the Permittee shall, within ten (10) working days of permit approval, send a copy of this permit to each regional development commission, local fire district, soil and water conservation district, watershed district, and watershed management district office with jurisdiction in the county where the site is located. Within thirty (30) days of approval of this permit, the Permittee shall send a copy of the permit to each landowner within the Project boundary. In no case shall the landowner receive this site permit and complaint procedure less than five (5) days prior to the start of construction on their property.

5.3 NOTICE OF PERMIT CONDITIONS

Prior to the start of construction, the Permittee shall inform all employees, contractors, and other persons involved in the construction and ongoing operation of the Project of the terms and conditions of this permit.

5.4 FIELD REPRESENTATIVE

At least ten (10) working days prior to the pre-construction meeting and continuously throughout construction, including site restoration, the Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this permit during the construction phase of this Project. This person (or a designee) shall be accessible by telephone during normal working hours. This person's address, phone number, and emergency phone number shall be provided to the Commission, which may make the number available to local residents and officials and other interested persons. The Permittee may change the field representative by notification to the Commission.

5.5 SITE MANAGER

The Permittee shall designate a site manager responsible for overseeing compliance with the conditions of this permit during the commercial operation and decommissioning phases of this Project. The Permittee shall provide the Commission with the name, address, and phone number, and emergency phone number of the site manager prior to placing any turbine into commercial operation. This information shall be maintained current by informing the Commission of any changes, as they become effective.

5.6 PRE-CONSTRUCTION MEETING

Prior to the start of any construction, the Permittee shall conduct a pre-construction meeting with the Field Representative and the State Permit Manager designated by the Commission to coordinate field monitoring of construction activities.

5.7 PRE-OPERATION COMPLIANCE MEETING

At least ten (10) working days prior to commercial operation, the Permittee shall conduct a pre-operation compliance meeting with the Site Manager and the State Permit Manager designated by the Commission to coordinate field monitoring of operation activities.

5.8 COMPLAINTS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission the company's procedures to be used to receive and respond to complaints. The Permittee shall report to the Commission all complaints received concerning any part of the Project in accordance with the procedures provided in Attachments 2 and 3 of this permit.

SECTION 6
SURVEYS AND REPORTING

6.1 BIOLOGICAL AND NATURAL RESOURCE INVENTORIES

The Permittee, in consultation with the Commission and DNR, shall design and conduct pre-construction desktop and field inventories of potentially impacted, if any, native prairies, wetlands, and any other biologically sensitive areas within the site and assess the presence of state threatened, endangered, or species of special concern or federally listed species. The results of any surveys shall be submitted to the Commission and DNR at least thirty (30) days prior to the pre-construction meeting to confirm compliance of conditions in this permit.

The Permittee shall provide to the Commission any biological surveys or studies conducted on this Project, including those not required under this permit.

6.2 SHADOW FLICKER

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall provide data on shadow flicker for each residence of non-participating landowners and participating

landowners. Information shall include the results of modeling used, assumptions made, and the anticipated duration of shadow flicker for each residence. The Permittee shall provide documentation on its efforts to minimize shadow flicker impacts.

6.3 ARCHAEOLOGICAL RESOURCES

The Permittee shall work with the State Historic Preservation Office (SHPO) and the State Archaeologist. The Permittee shall carry out a Phase 1 or 1A Archaeology survey for all proposed turbine locations, access roads, junction boxes, and other areas of Project construction impact to determine whether additional archaeological work is necessary for any part of the proposed Project. The Permittee shall contract with a qualified archaeologist to complete such surveys, and shall submit the results to the Commission, the SHPO, and the State Archaeologist at least ten (10) working days prior to the pre-construction meeting.

The SHPO and the State Archaeologist will make recommendations for the treatment of any significant archaeological sites which are identified. Any issues in the implementation of these recommendations will be resolved by the Commission in consultation with SHPO and the State Archaeologist. The Permittee shall not excavate at such locations until so authorized by the Commission in consultation with the SHPO and the State Archaeologist.

If human remains are encountered during construction, the Permittee shall immediately halt construction at that location and promptly notify local law enforcement authorities and the State Archaeologist. Construction at the human remains location shall not proceed until authorized by local law enforcement authorities or the State Archaeologist. If any federal funding, permit, or license is involved or required, the Permittee shall notify the SHPO as soon as possible in the planning process to coordinate section 106 (36 C.F.R. part 800) review.

Prior to construction, construction workers shall be trained about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If any archaeological sites are found during construction, the Permittee shall immediately stop work at the site and shall mark and preserve the site and notify the Commission, SHPO, and State Archaeologist about the discovery. The Commission and SHPO shall have three working days from the time the agency is notified to conduct an inspection of the site if either agency shall choose to do so. On the fourth day after notification, the Permittee may begin work on the site unless the SHPO has directed that work shall cease. In such event, work shall not continue until the SHPO determines that construction can proceed.

6.4 INTERFERENCE

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission the results of an assessment of television and radio signal reception, microwave signal patterns, and telecommunications in the Project area. The assessment shall be designed to provide data that can be used in the future to determine whether the turbines and associated facilities are the cause of disruption or interference of television or radio reception, microwave patterns, or telecommunications in the event residents should complain about such disruption or interference after the turbines are placed in operation. The Permittee shall be

responsible for alleviating any disruption or interference of these services caused by the turbines or any associated facilities.

The Permittee shall not operate the Project so as to cause microwave, television, radio, telecommunications, or navigation interference in violation of Federal Communications Commission regulations or other law. In the event the Project or its operations cause such interference, the Permittee shall take timely measures necessary to correct the problem.

6.5 WAKE LOSS STUDIES

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall provide to the Commission the pre-construction micro-siting analysis leading to the final tower locations and an estimate of total Project wake losses. The Permittee shall provide to the Commission any operational wake loss studies conducted on this Project.

6.6 NOISE

The Permittee shall submit a proposal to the Commission at least ten (10) working days prior to the pre-operation compliance meeting for the conduct of a post-construction noise study. Upon the approval of the Commission, the Permittee shall carryout the study. The study shall be designed to determine the operating LWECS noise levels at different frequencies and at various distances from the turbines at various wind directions and speeds. The Permittee shall submit the study within eighteen (18) months after commercial operation.

6.7 AVIAN AND BAT PROTECTION PLAN

The Permittee shall, in consultation with the Commission and DNR, prepare an Avian and Bat Protection Plan and submit it to the Commission at least ten (10) working days prior to the pre-construction meeting. The plan shall address steps to be taken to identify and mitigate impacts to avian and bat species during the construction phase and the operation phase of the Project. The plan shall also include formal and informal monitoring, training, wildlife handling, documentation (e.g., photographs), and reporting protocols for each phase of the Project.

The Permittee shall submit quarterly avian and bat reports to the Commission. Quarterly reports are due by the 15th of each January, April, July, and October commencing the day following commercial operation and terminating upon the expiration of this permit. Each report shall identify any dead or injured avian and bat species, location of find by turbine number, and date of find for the reporting period in accordance with the reporting protocols.

The Permittee shall notify the Commission, United States Fish and Wildlife Service (USFWS), and DNR within twenty-four (24) hours of the discovery of any of the following within the vicinity of the rotor swept area:

(a) five or more dead or injured non-protected avian or bat species within a reporting period;

(b) one or more dead or injured migratory avian or bat species;

(c) one or more dead or injured state threatened, endangered, or species of special concern; or

(d) one or more dead or injured federally listed species.

6.8 PROJECT ENERGY PRODUCTION

The Permittee shall submit a report no later than February 1st following each complete year of Project operation. The report shall include:

(a) The rated nameplate capacity of the permitted Project;

(b) The total monthly energy generated by the Project in MW hours;

(c) The monthly capacity factor of the Project;

(d) Yearly energy production and capacity factor for the Project;

(e) The operational status of the Project and any major outages, major repairs, or turbine performance improvements occurring in the previous year; and

(f) Any other information reasonably requested by the Commission.

This information shall be considered public and must be submitted electronically.

6.9 WIND RESOURCE USE

The Permittee shall, upon the request of the Commission, report to the Commission on the monthly energy production of the Project and the average monthly wind speed collected at one permanent meteorological tower selected by the Commission during the preceding year or partial year of operation.

The provisions of Section 11.7 shall apply to the Commission's review of data provided pursuant to this section.

6.10 EXTRAORDINARY EVENTS

Within twenty-four (24) hours of an occurrence, the Permittee shall notify the Commission of any extraordinary event. Extraordinary events include but shall not be limited to: fires, tower collapse, thrown blade, collector or feeder line failure, and injured LWECS worker or private person. The Permittee shall, within thirty (30) days of the occurrence, submit a report to the Commission describing the cause of the occurrence and the steps taken to avoid future occurrences.

SECTION 7
CONSTRUCTION AND OPERATION PRACTICES

7.1 SITE CLEARANCE

The Permittee shall disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the Project.

7.2 TOPSOIL PROTECTION

The Permittee shall implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner(s).

7.3 SOIL COMPACTION

The Permittee shall implement measures to minimize soil compaction of all lands during all phases of the Project's life and shall confine compaction to as small an area as practicable.

7.4 LIVESTOCK PROTECTION

The Permittee shall take precautions to protect livestock during all phases of the Project's life.

7.5 FENCES

The Permittee shall promptly replace or repair all fences and gates removed or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner(s). When the Permittee installs a gate where electric fences are present, the Permittee shall provide for continuity in the electric fence circuit.

7.6 DRAINAGE TILES

The Permittee shall take into account the location of drainage tiles during Project layout and construction. The Permittee shall promptly repair or replace all drainage tiles broken or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner(s).

7.7 EQUIPMENT STORAGE

The Permittee shall not locate temporary equipment staging areas on lands under its control unless negotiated with affected landowner(s). Temporary staging areas shall not be located in wetlands or native prairie as defined in Sections 4.6 and 4.7.

7.8 ROADS

7.8.1 PUBLIC ROADS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall identify all state, county, or township roads that will be used for the Project and shall notify the Commission and the state, county, or township governing body having jurisdiction over the roads to determine if the governmental body needs to inspect the roads prior to use of these roads. Where practical, existing roadways shall be used for all activities associated with the Project. Where practical, all-weather roads shall be used to deliver cement, turbines, towers, assembled nacelles, and all other heavy components to and from the turbine sites.

The Permittee shall, prior to the use of such roads, make satisfactory arrangements with the appropriate state, county, or township governmental body having jurisdiction over roads to be used for construction of the Project for maintenance and repair of roads that will be subject to extra wear and tear due to transportation of equipment and Project components. The Permittee shall notify the Commission of such arrangements upon request of the Commission.

7.8.2 TURBINE ACCESS ROADS

The Permittee shall construct the least number of turbine access roads it can. Access roads shall be low profile roads so that farming equipment can cross them and shall be covered with Class five gravel or similar material. Access roads shall not be constructed across streams and drainage ways without required permits and approvals from the DNR, USFWS, and/or USACE. When access roads are constructed across streams and drainage ways, the access roads shall be designed in a manner so runoff from the upper portions of the watershed can readily flow to the lower portion of the watershed. Access roads shall also be constructed in accordance with all necessary township, county, or state road requirements and permits.

7.8.3 PRIVATE ROADS

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner(s).

7.9 CLEANUP

The Permittee shall remove all waste and scrap that is the product of construction, operation, restoration, and maintenance from the site and properly dispose of it upon completion of each task. Personal litter, bottles, and paper deposited by site personnel shall be removed on a daily basis.

7.10 TREE REMOVAL

The Permittee shall minimize the removal of trees and the Permittee shall not remove groves of trees or shelter belts without notification to the Commission and the approval of the affected landowner(s).

7.11 SOIL EROSION AND SEDIMENT CONTROL

The Permittee shall develop a Soil Erosion and Sediment Control Plan and submit the Plan to the Commission at least ten (10) working days prior to the pre-construction meeting. This Plan may be the same as the Storm Water Pollution Prevention Plan (SWPPP) submitted to the PCA as part of the National Pollutant Discharge Elimination System (NPDES) permit application.

The Soil Erosion and Sediment Control Plan shall address what types of erosion control measures will be implemented during each Project phase and shall at a minimum identify: plans for grading, construction, and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive re-vegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary Project activities; and measures to minimize the area of surface disturbance. Other practices shall include containing excavated material, protecting exposed soil, and stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The plan shall identify methods for disposal or storage of excavated material. Erosion and sedimentation control measures shall be implemented prior to construction and maintained throughout the Project's life.

The Permittee shall develop an invasive species prevention plan to prevent the introduction of invasive species on lands disturbed by project construction activities. This requirement may be included as an element of the Soil Erosion and Sediment Control Plan.

7.12 RESTORATION

The Permittee shall, as soon as practical following construction of each turbine, considering the weather and preferences of the affected landowner(s), restore the area affected by any Project activities to the condition that existed immediately before construction began, to the extent possible. The time period may be no longer than twelve (12) months after completion of construction of the turbine, unless otherwise negotiated with the affected landowner(s). Restoration shall be compatible with the safe operation, maintenance, and inspection of the Project.

7.13 HAZARDOUS WASTE

The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean-up, and disposal of hazardous wastes generated during any phase of the Project's life.

7.14 APPLICATION OF HERBICIDES

The Permittee shall restrict herbicide use to those herbicides and methods of application approved by the Minnesota Department of Agriculture and the U.S. Environmental Protection Agency. Selective foliage or basal application shall be used when practicable. The Permittee shall contact the landowner or his designee to obtain approval for the use of herbicide prior to any application on their property. The landowner may request that there be no application of herbicides on any part of the site within the landowner's property. All herbicides shall be applied

in a safe and cautious manner so as to not damage property, including crops, orchards, tree farms, or gardens. The Permittee shall also, at least ten (10) working days prior to the application, notify beekeepers with an active apiary within one mile of the proposed application site of the day the company intends to apply herbicide so that precautionary measures may be taken by the beekeeper.

7.15 PUBLIC SAFETY

The Permittee shall provide educational materials to landowners within the site boundary and, upon request, to interested persons about the Project and any restrictions or dangers associated with the Project. The Permittee shall also provide any necessary safety measures, such as warning signs and gates for traffic control or to restrict public access. The Permittee shall submit the location of all underground facilities, as defined in Minnesota Statutes section 216D.01, subdivision 11, to Gopher State One Call.

7.16 EMERGENCY RESPONSE

The Permittee shall prepare an emergency response plan (fire protection and medical emergency plan) in consultation with the emergency responders having jurisdiction over the area prior to Project construction. The Permittee shall submit a copy of the plan to the Commission at least ten (10) working days prior to the pre-construction meeting and a revised plan, if any, at least ten (10) working days prior to the pre-operation compliance meeting. The Permittee shall also register the Project with the local governments' emergency 911 services.

7.17 TOWER IDENTIFICATION

All turbine towers shall be marked with a visible identification number.

7.18 FEDERAL AVIATION ADMINISTRATION LIGHTING

Towers shall be marked as required by the FAA. There shall be no lights on the towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the wind monitoring equipment.

SECTION 8
FINAL CONSTRUCTION

8.1 AS-BUILT PLANS AND SPECIFICATIONS

Within sixty (60) days after completion of construction, the Permittee shall submit to the Commission a copy of the as-built plans and specifications. The Permittee must also submit this data in a GIS compatible format so that the Commission can place it into the Minnesota Geospatial Information Office's geographic data clearinghouse located in the Department of Administration.

8.2 FINAL BOUNDARIES

After completion of construction, the Commission shall determine the need to adjust the final boundaries of the site required for this Project. If done, this permit may be modified, after notice and opportunity for public hearing, to represent the actual site required by the Permittee to operate the Project authorized by this permit.

8.3 EXPANSION OF SITE BOUNDARIES

No expansion of the site boundaries described in this permit shall be authorized without the approval of the Commission. The Permittee may submit to the Commission a request for a change in the boundaries of the site for the Project. The Commission will respond to the requested change in accordance with applicable statutes and rules.

SECTION 9
DECOMMISSIONING, RESTORATION, AND ABANDONMENT

9.1 DECOMMISSIONING PLAN

At least ten (10) working days prior to the pre-operation compliance meeting, the Permittee shall submit to the Commission a Decommissioning Plan documenting the manner in which the Permittee anticipates decommissioning the Project in accordance with the requirements of Minnesota Rules 7854.0500, subpart 13. The Permittee shall ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. The Commission may at any time request the Permittee to file a report with the Commission describing how the Permittee is fulfilling this obligation.

9.2 SITE RESTORATION

Upon expiration of this permit, or upon earlier termination of operation of the Project, or any turbine within the Project, the Permittee shall have the obligation to dismantle and remove from the site all towers, turbine generators, transformers, overhead and underground cables and lines, foundations, buildings, and ancillary equipment to a depth of four feet. To the extent feasible, the Permittee shall restore and reclaim the site to its pre-project topography and topsoil quality. All access roads shall be removed unless written approval is given by the affected landowner(s) requesting that one or more roads, or portions thereof, be retained. Any agreement for removal to a lesser depth or no removal shall be recorded with the county and shall show the locations of all such foundations. All such agreements between the Permittee and the affected landowner(s) shall be submitted to the Commission prior to completion of restoration activities. The site shall be restored in accordance with the requirements of this condition within 18 months after expiration.

9.3 ABANDONED TURBINES

The Permittee shall advise the Commission of any turbines that are abandoned prior to termination of operation of the Project. A Project, or any turbine within the Project, shall be

considered abandoned after one (1) year without energy production and the land restored pursuant to Section 9.2 unless a plan is developed and submitted to the Commission outlining the steps and schedule for returning the Project, or any turbine within the Project, to service.

SECTION 10
AUTHORITY TO CONSTRUCT LWECS

10.1 WIND RIGHTS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall demonstrate that it has obtained the wind rights and any other rights necessary to construct and operate the Project within the boundaries of the LWECS authorized by this permit.

Nothing in this permit shall be construed to preclude any other person from seeking a permit to construct a WECS in any area within the boundaries of the Project covered by this permit if the Permittee does not hold exclusive wind rights for such areas.

10.2 POWER PURCHASE AGREEMENT

In the event the Permittee does not have a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project at the time this permit is issued, the Permittee shall provide notice to the Commission when it obtains a commitment for purchase of the power. This permit does not authorize construction of the Project until the Permittee has obtained a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project. In the event the Permittee does not obtain a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project within two years of the issuance of this permit, the Permittee must advise the Commission of the reason for not having such commitment. In such event, the Commission may determine whether this permit should be amended or revoked. No amendment or revocation of this permit may be undertaken except in accordance with applicable statutes and rules, including Minnesota Rule 7854.1300.

10.3 FAILURE TO COMMENCE CONSTRUCTION

If the Permittee has not completed the pre-construction surveys required under this permit and commenced construction of the Project within two years of the issuance of this permit, the Permittee must advise the Commission of the reason construction has not commenced. In such event, the Commission shall make a determination as to whether this permit should be amended or revoked. No revocation of this permit may be undertaken except in accordance with applicable statutes and rules, including Minnesota Rule 7854.1300.

10.4 PREEMPTION OF OTHER LAWS

Pursuant to Minnesota Statutes section 216F.07, this site permit shall be the only site approval required for the location of this Project, and this permit shall supersede and preempt all zoning, building, and land use rules, regulations, and ordinances adopted by regional, county, local, and

special purpose governments. Nothing in this permit shall release the Permittee from any obligation imposed by law that is not superseded or preempted by law.

10.5 OTHER PERMITS

The Permittee shall be responsible for acquiring any other federal, state, or local permits or authorizations that may be required to construct and operate a LWECS within the authorized site. The Permittee shall submit a copy of such permits and authorizations to the Commission upon request.

10.5.1 COMPLIANCE WITH FEDERAL AND STATE AGENCY PERMITS

The Permittee shall comply with all terms and conditions of permits or licenses issued by Federal, State, or Tribal authorities including but not limited to the requirements of the PCA (Section 401 Water Quality Certification, National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) stormwater permit for construction activity, and other site specific discharge approvals), DNR (License to Cross Public Lands and Water, Public Water Works Permit, and state protected species consultation), SHPO (Section 106 Historic Consultation Act), FAA determinations, and DOT (Utility Access Permit, Highway Access Permit, Oversize and Overweight Permit, and Aeronautics Airspace Obstruction Permit).

10.5.2 COMPLIANCE WITH COUNTY, CITY, OR MUNICIPAL PERMITS

The Permittee shall comply with all terms and conditions of permits or licenses issued by the counties, cities, and municipalities affected by the Project that do not conflict with or are not pre-empted by federal or state permits and regulations.

SECTION 11
COMMISSION POST-ISSUANCE AUTHORITIES

11.1 PERIODIC REVIEW

The Commission shall initiate a review of this permit and the applicable conditions at least once every five (5) years. The purpose of the periodic review is to allow the Commission, the Permittee, and other interested persons an opportunity to consider modifications in the conditions of this permit. No modification may be made except in accordance with applicable statutes and rules.

11.2 MODIFICATION OF CONDITIONS

After notice and opportunity for hearing, this permit may be modified or amended for cause, including but not limited to the following:

(a) Violation of any condition in this permit;

(b) Endangerment of human health or the environment by operation of the Project; or

(c) Existence of other grounds established by rule.

11.3 REVOCATION OR SUSPENSION OF PERMIT

The Commission may take action to suspend or revoke this permit upon the grounds that:

(a) A false statement was knowingly made in the application or in accompanying statements or studies required of the Permittee, and a true statement would have warranted a change in the Commission's findings;

(b) There has been a failure to comply with material conditions of this permit, or there has been a failure to maintain health and safety standards; or

(c) There has been a material violation of a provision of an applicable statute, rule, or an order of the Commission.

In the event the Commission determines that it is appropriate to consider revocation or suspension of this permit, the Commission shall proceed in accordance with the requirements of Minnesota Rule 7854.1300 to determine the appropriate action. Upon a finding of any of the above, the Commission may require the Permittee to undertake corrective measures in lieu of having this permit suspended or revoked.

11.4 MORE STRINGENT RULES

The Commission's issuance of this site permit does not prevent the future adoption by the Commission of rules or orders more stringent than those now in existence and does not prevent the enforcement of these more stringent rules and orders against the Permittee.

11.5 TRANSFER OF PERMIT

The Permittee may not transfer this permit without the approval of the Commission. If the Permittee desires to transfer this permit, the holder shall advise the Commission in writing of such desire. The Permittee shall provide the Commission with such information about the transfer as the Commission requires to reach a decision. The Commission may impose additional conditions on any new Permittee as part of the approval of the transfer.

11.6 RIGHT OF ENTRY

Upon reasonable notice, presentation of credentials, and at all times in compliance with the Permittee's site safety standards, the Permittee shall allow representatives of the Commission to perform the following:

(a) To enter upon the facilities easement of the site property for the purpose of obtaining information, examining records, and conducting surveys or investigations;

(b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations;

(c) To sample and monitor upon the facilities easement of the property; and

(d) To examine and copy any documents pertaining to compliance with the conditions of this permit.

11.7 PROPRIETARY INFORMATION

Certain information required to be submitted to the Commission under this permit, including energy production and wake loss data, may constitute trade secret information or other type of proprietary information under the Data Practices Act or other law and is not to be made available by the Commission. The Permittee must satisfy requirements of applicable law to obtain the protection afforded by the law.

SECTION 12
EXPIRATION DATE

This permit shall expire thirty (30) years after the date this permit was approved and adopted.

SECTION 13
SPECIAL CONDITIONS

Special conditions shall take precedence over any of the other conditions of this Permit if there should be a conflict between the two.

13.1 APPLICATION OF STEARNS COUNTY STANDARDS

Stearns County adopted more stringent standards than those identified this permit that affect the following:

13.1.1 ELECTRICAL COLLECTOR AND FEEDER LINES

All feeder and collector lines shall be buried underground.

13.1.2 STEARNS COUNTY SHORELAND DISTRICTS

Wind turbine towers shall not be located in shoreland districts as designated by Stearns County at the time this permit is issued.

13.2 AVIAN AND BAT PROTECTION PLAN SPECIAL PROVISION

The Avian and Bat Protection Plan in Section 6.7 shall include survey plans and protocols to conduct post-construction avian and bat fatality surveys. The post-construction avian and bat fatality surveys shall be conducted for a minimum of one year based on results of pre-construction surveys conducted in the Project area. The results of the post-construction avian

and bat surveys shall be submitted to the Commission. Based on those results, the Commission may modify conditions in this permit pursuant to Section 11.2.

Attachment 1
Project Boundary Map

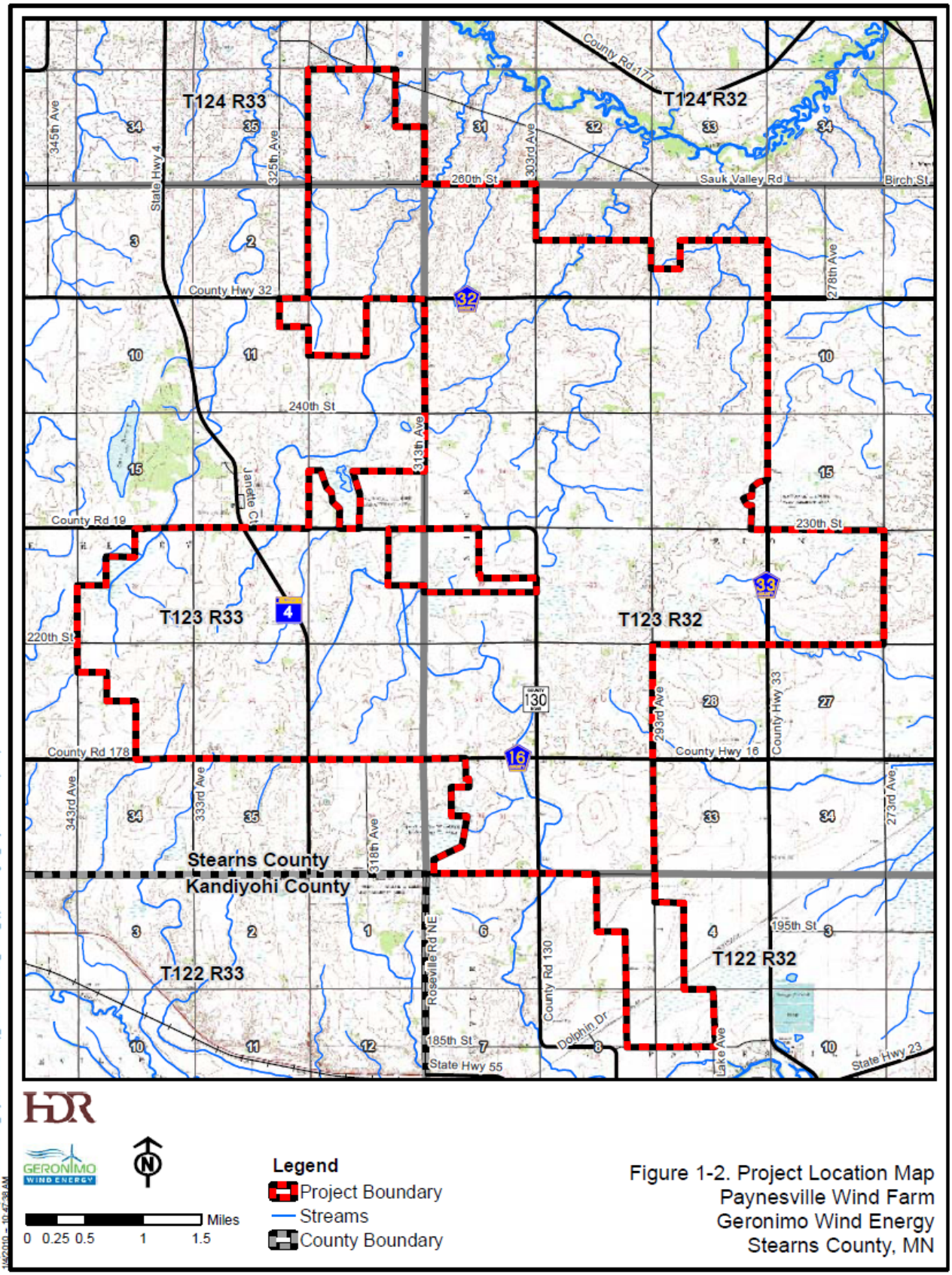
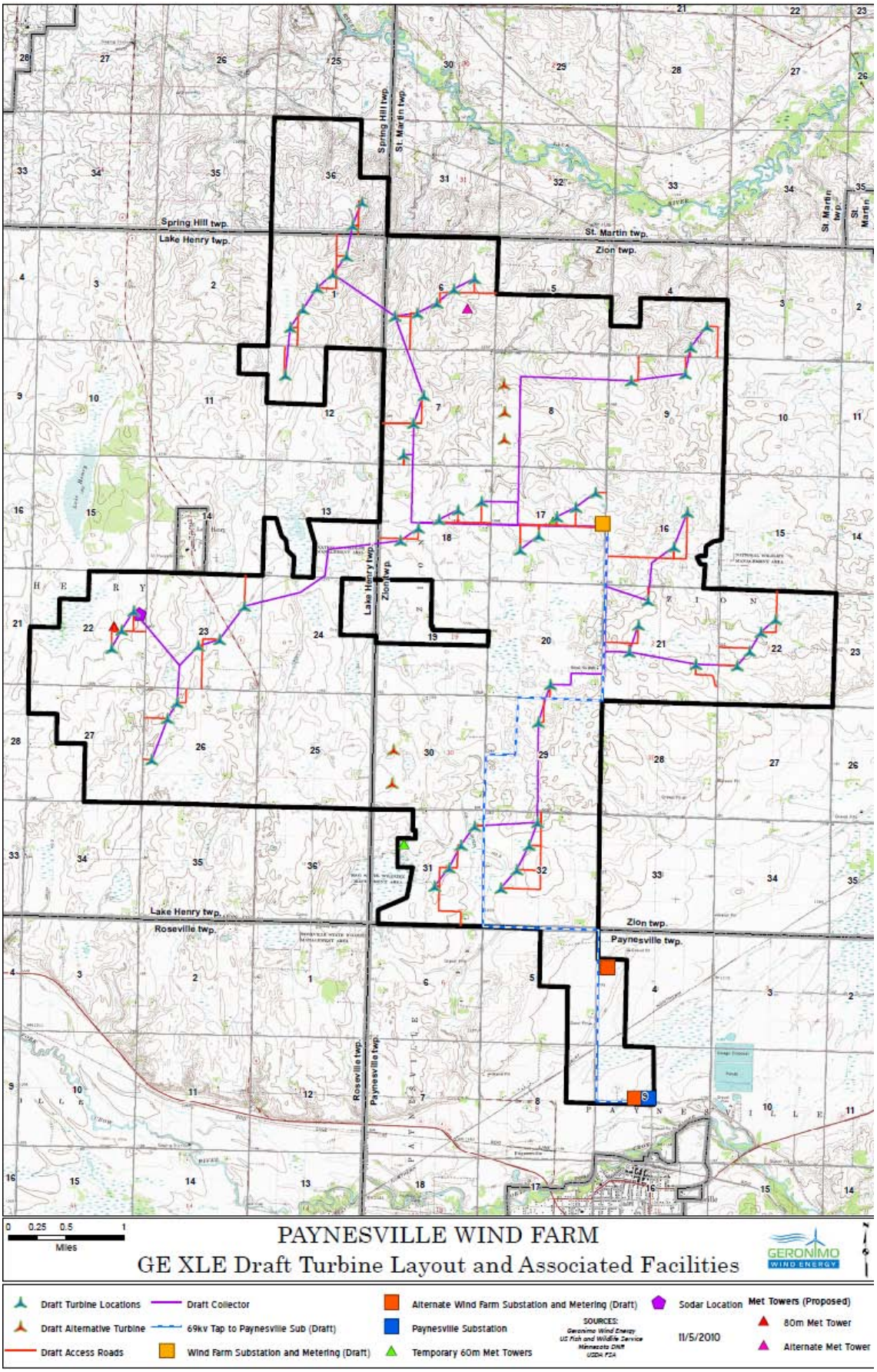
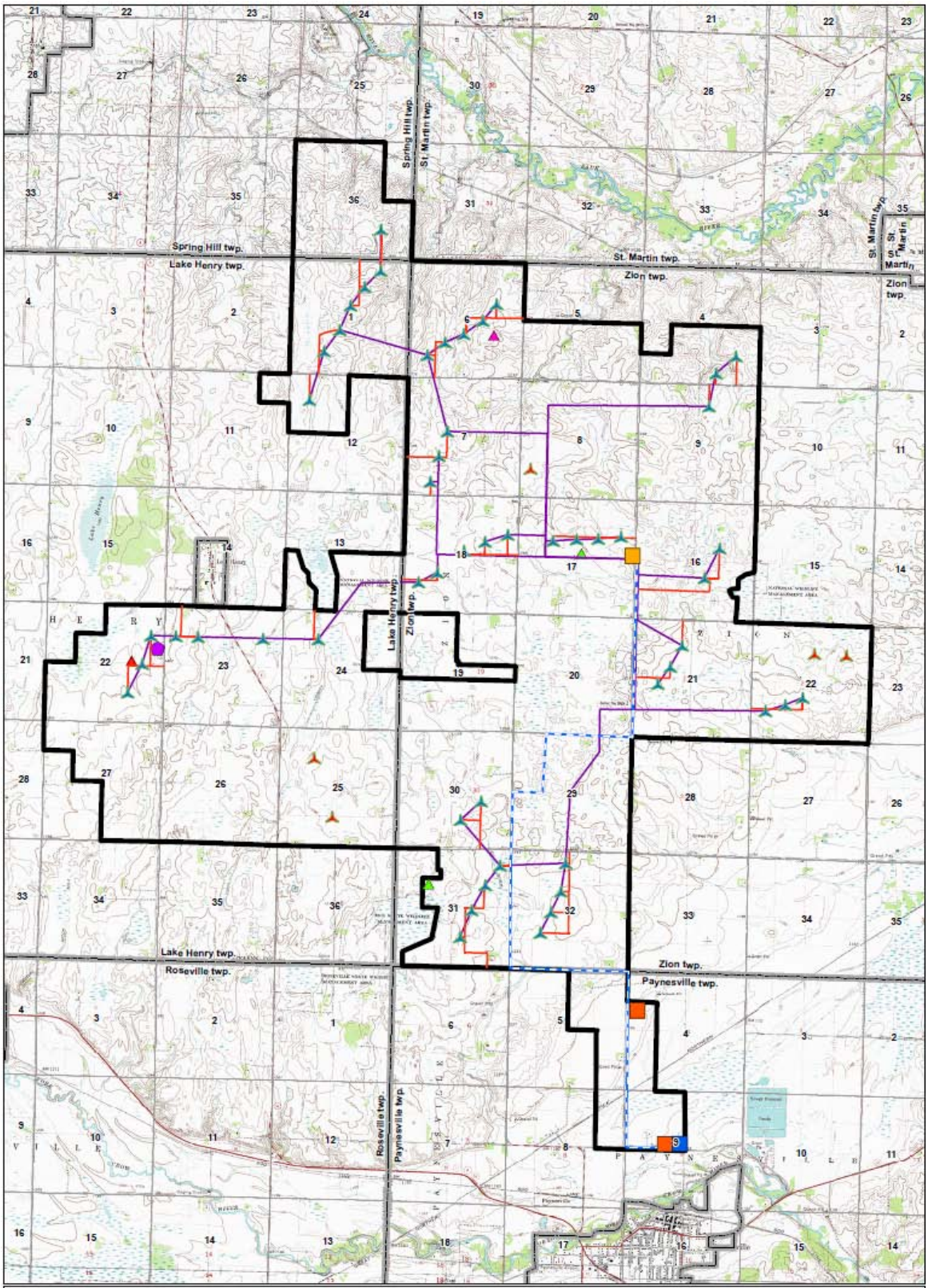


Figure 1-2. Project Location Map
Paynesville Wind Farm
Geronimo Wind Energy
Stearns County, MN

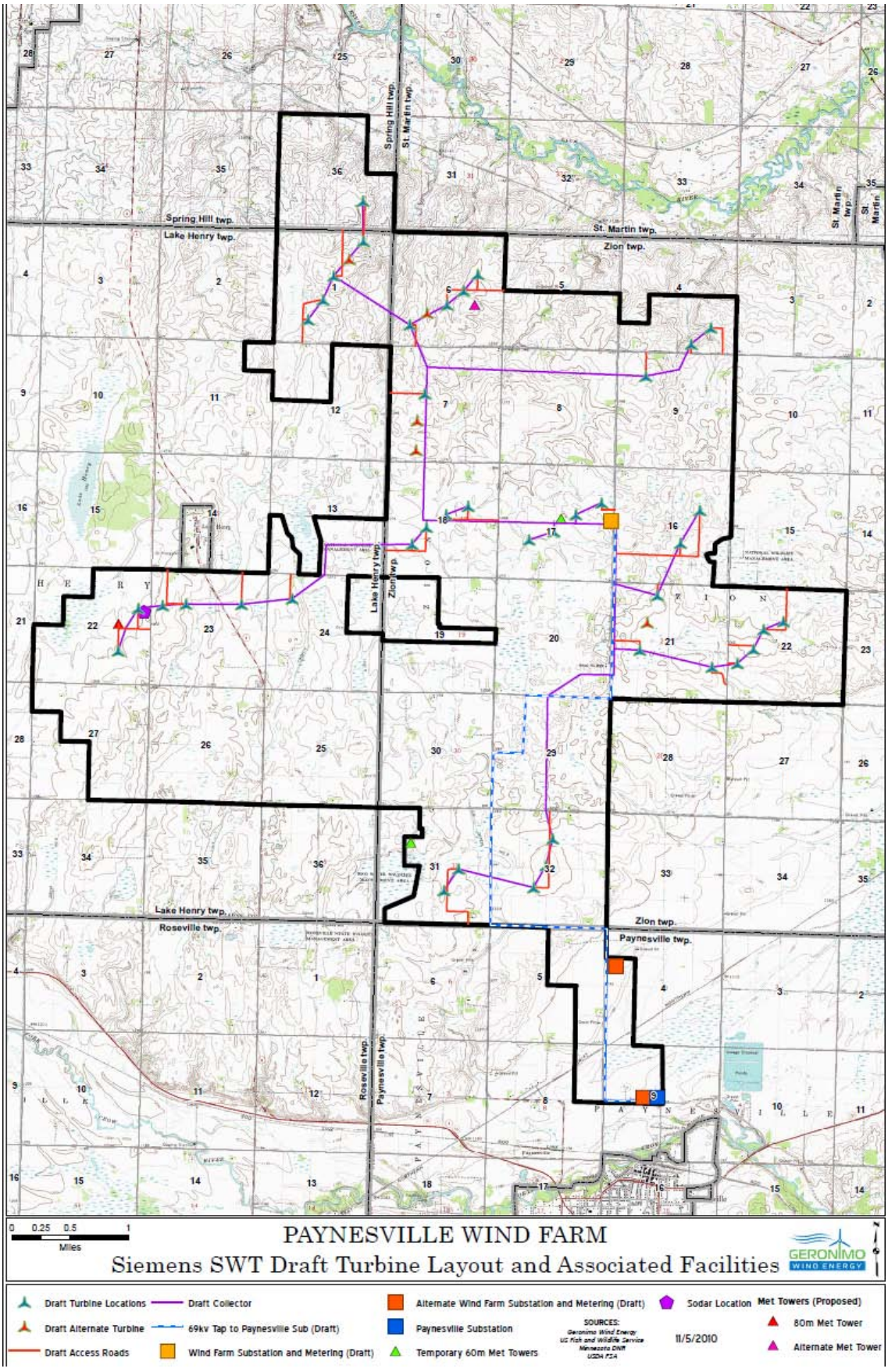
Attachment 1A
GE Turbine Layout



Attachment 1B
Vestas Turbine Layout



Attachment 1C
Siemens Turbine Layout



MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLAINT HANDLING PROCEDURES
FOR
LARGE WIND ENERGY CONVERSION SYSTEMS

A. Purpose:

To establish a uniform and timely method of reporting complaints received by the Permittee concerning Permit conditions for site preparation, construction, cleanup and restoration, operation, and resolution of such complaints.

B. Scope:

This document describes Complaint reporting procedures and frequency.

C. Applicability:

The procedures shall be used for all complaints received by the Permittee and all complaints received by the Commission under Minn. Rule 7829.1500 or 7829.1700 relevant to this Permit.

D. Definitions:

Complaint: A verbal or written statement presented to the Permittee by a person expressing dissatisfaction or concern regarding site preparation, cleanup or restoration or other LWECS and associated facilities site permit conditions. Complaints do not include requests, inquiries, questions, or general comments.

Substantial Complaint: A written Complaint alleging a violation of a specific Site Permit condition that, if substantiated, could result in Permit modification or suspension pursuant to the applicable regulations.

Unresolved Complaint: A Complaint which, despite the good faith efforts of the permittee and a person(s), remains to both or one of the parties unresolved or unsatisfactorily resolved.

Person: An individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

E. Complaint Documentation and Processing:

1. The Permittee shall document all Complaints by maintaining a record of all applicable information concerning the Complaint, including the following:

a. Name of complainant, address, phone number, and e-mail address.
b. Precise property description or parcel number.
c. Name of Permittee representative receiving Complaint and date of receipt.
d. Nature of Complaint and the applicable Site Permit conditions(s).
e. Activities undertaken to resolve the Complaint.
f. Final disposition of the Complaint.

2. The Permittee shall designate an individual to summarize Complaints to the Commission. This person's name, phone number and e-mail address shall accompany all complaint submittals.

3. A Person presenting the Complaint should to the extent possible, include the following information in their communications:

a. Name, address, phone number, and e-mail address.
b. Date
c. Tract or parcel
d. Whether the complaint relates to (1) a Site Permit matter, (2) a LWECS and associated facility issue, or (3) a compliance issue.

F. Reporting Requirements:

The Permittee shall report all complaints to the Commission according to the following schedule:

Immediate Reports: All substantial complaints shall be reported to the Commission the same day received, or on the following working day for complaints received after working hours. Such reports are to be directed to Wind Permit Compliance, 1-800-657-3794, or by e-mail to: DOC.energypermitcompliance@state.mn.us, or. Voice messages are acceptable.

Monthly Reports: By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the preceding month, shall be Filed to Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, using the Minnesota Department of Commerce eDocket system (see eFiling instructions attached to this permit).

If no Complaints were received during the preceding month, the permittee shall submit (eFile) a summary indicating that no complaints were received.

G. Complaints Received by the Commission or OES:

Complaints received directly by the Commission from aggrieved persons regarding site preparation, construction, cleanup, restoration, operation and maintenance shall be promptly sent to the Permittee.

H. Commission Process for Unresolved Complaints:

Initial Screening: Commission staff shall perform an initial evaluation of unresolved Complaints submitted to the Commission. Complaints raising substantial LWECS Site Permit issues shall be processed and resolved by the Commission. Staff shall notify Permittee and appropriate person(s) if it determines that the Complaint is a Substantial Complaint. With respect to such Complaints, each party shall submit a written summary of its position to the Commission no later than ten (10) days after receipt of the Staff notification. Staff shall present Briefing Papers to the Commission, which shall resolve the Complaint within twenty days of submission of the Briefing Papers.

I. Permittee Contacts for Complaints:

Mailing Address: Complaints filed by mail shall be sent to the address below:

Paynesville Wind LLC c/o
Geronimo Wind Energy
Patrick Smith
7650 Edinborough Way, Suite 725
Edina, MN 55435

Tel: 952-988-9000

Email: Patrick@geronimowind.com

ATTACHMENT 3

MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLIANCE FILING PROCEDURE
FOR PERMITTED ENERGY FACILITIES

1. Purpose

To establish a uniform and timely method of submitting information required by the Commission energy facility permits.

2. Scope and Applicability

This procedure encompasses all compliance filings required by permit.

3. Definitions

Compliance Filing – A sending (filing) of information to the Commission, where the information is required by a Commission site or route permit.

4. Responsibilities

A) The permittee shall eFile all compliance filings with Dr. Burl Haar, Executive Secretary, Public Utilities Commission, through the Department of Commerce (DOC) eDocket system. The system is located on the DOC website: https://www.edockets.state.mn.us/EFiling/home.jsp

General instructions are provided on the website. Permittees must register on the website to eFile documents.

B) All filings must have a cover sheet that includes:
1) Date
2) Name of submitter / permittee
3) Type of Permit (Site or Route)
4) Project Location
5) Project Docket Number
6) Permit Section Under Which the Filing is Made
7) Short Description of the Filing

C) Filings that are graphic intensive (e.g., maps, plan and profile) must, in addition to being eFiled, be submitted as paper copies and on CD. Copies and CDs should be sent to: 1) Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN, 55101-2147, and 2) Department of Commerce, Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN, 55101-2198. Additionally, the Commission may request a paper copy of any eFiled document.

PERMIT COMPLIANCE FILINGS[1]

PERMITTEE: Paynesville Wind, LLC
PERMIT TYPE: LWECS Site Permit
PROJECT LOCATION: Stearns County
COMMISSION DOCKET NUMBER: IP-6830/WS-10-49

PRE-CONSTRUCTION MEETING

Filing Number	Permit Section	Description	Due Date	Notes
1	4.7	Native Prairie Protection Plan	Ten working days prior to pre-construction meeting, if required	Develop in consultation with Commission and DNR
2	5.1	Site Plan	Ten working days prior to pre-construction meeting	
3	5.4	Field Representative	Ten working days prior to pre-construction meeting	
4	5.8	Complaint Reporting Procedures	Ten working days prior to pre-construction meeting and complaint submittals on the 15th of each month or within 24 hours	
5	6.1	Biological & Natural Resource Inventories	Ten working days prior to pre-construction meeting	Results may trigger need for a Native Prairie Protection Plan
6	6.2	Shadow Flicker Analysis	Ten working days prior to pre-construction meeting	
7	6.3	Archaeological Resources	Ten working days prior to pre-construction meeting and as recommended by the State Historic Preservation Office	

[1] This compilation of permit compliance filings is provided for the convenience of the permittee and the Commission. However, it is not a substitute for the permit; the language of the permit controls.

PERMIT COMPLIANCE FILINGS

PRE-CONSTRUCTION MEETING

Filing Number	Condition	Description	Due Date	Notes
8	6.4	Interference	Ten working days prior to pre-construction meeting	
9	6.5	Wake Loss	Ten working days prior to pre-construction meeting and may be included with site plan or operation studies if performed	
10	6.7	Avian and Bat Protection Plan	Ten days prior to pre-construction meeting	Develop in consultation with Commission and DNR
11	7.8	Roads	Ten working days prior to pre-construction meeting	
12	7.11	Soil Erosion and Sediment Control Plan	Ten working days prior to pre-construction	
13	7.16	Emergency Response	Ten working days prior to pre-construction meeting. Must register in 911 Program	
14	10.1	Wind Rights	Ten working days prior to pre-construction meeting	

PRE-OPERATION COMPLIANCE MEETING

Filing Number	Permit Section	Description	Due Date	Notes
15	5.7	Pre-operation compliance meeting	Ten working days prior to commercial operation	
16	6.6	Noise Study Protocol	Ten working days prior to pre-operation meeting	
17	9.1 & 9.3	Decommissioning Plan	Ten working days prior to commercial operation	

OTHER REQUIREMENTS

Filing Number	Permit Section	Description	Due Date	Notes
18	5.2	Notice to Landowners and Governmental Units	Within 10 working days of permit approval	
19	5.5	Site Manager	Ten working days prior to prior to commercial operation	
20	6.6	Noise Study Results	Within 18 months of Commercial Operation, if required	
21	6.7	Avian and Bat Reporting Requirements	Quarterly Requirements	
22	6.8	Project Energy Production	Due 2/1 each year or quarterly	
23	6.9	Wind Resource Use	Upon request of the Commission	
24	6.10	Extraordinary Events	Within 24 hours and report on occurrence of event within 30 days	
25	8.1	As Builts	Within 60 days of completion of construction	
26	10.3	Failure to Start Construction	Within 2 years of permit issuance	

DEPARTMENT OF NATURAL RESOURCES STATE OF MINNESOTA
Division of Ecological Resources Memorandum

DATE: November 5, 2010 **PHONE:** (651) 259-5115

TO: Ingrid Bjorklund
Department of Commerce, Office of Energy Security

FROM: Jamie Schrenzel
MDNR, Division of Ecological Resources

SUBJECT: Paynesville Wind Project, DNR Comments Regarding Avian and Bat Surveys

The Minnesota Department of Natural Resources (DNR) has reviewed the reports titled "Avian Surveys for the Paynesville Wind Resource Area" and "Acoustic Bat Studies for the Paynesville-Zion Wind Resource Area." The following comments and recommendations regarding these reports are provided for consideration in development of Office of Energy Security (OES) recommendations to the Public Utilities Commission (PUC) prior to a decision on issuance of the final site permit. Comment topics include recommendations regarding grasslands and prairie, possibly flyways, construction scheduling, turbine height, and future monitoring needs for birds and bats.

The DNR appreciates the effort the applicant made to thoroughly survey the Paynesville Wind Site and implement suggested protocol after meetings with agencies. Generally, the DNR concurs with many of the recommendations included in reports submitted. The following comments are included to help refine recommendations and to suggest specific content for the Avian and Bat Protection plan appropriate to this site to address the findings of the avian and bat studies submitted.

The Avian Survey for the Paynesville Wind Project included a recommendation for avoidance of siting turbines in native or recovered grassland habitat in favor of placing turbines in cropland (pg. 29). The DNR, similarly, recommends avoidance of siting turbines or associated infrastructure in prairie or large tracts (>40 acres) of contiguous grasslands. It is also recommended that the Avian Protection Plan include a requirement to provide an assessment, based on the currently available survey data and literature review, how micrositing can further address protection of grasslands species that are experiencing decline or are sensitive to wind development (see pg. 13 of Avian Report). For example, turbines located near areas where declining grassland species were found in surveys may warrant appropriate additional avoidance from the edge of grasslands or prairie habitat based on existing literature.

The avian survey of the Paynesville Wind Project also included an assessment of flight paths of various species from each observation point used for data collection. The DNR generally concurs with the conclusions of the report that, though there is high waterfowl and waterbird use and presence of the state-listed threatened Trumpeters Swan, state-listed Special Concern Species and species in regional decline, no clear flight path behavior appears to be present between specific project area features. However, survey results show that certain areas, such as Observation Point #5 and Observation point #7 located in the vicinity of state and federal conservation lands and water features, indicate higher numbers of total detections and presence of threatened, declining or special concern species. The DNR recommends that the Avian and Bat Protection Plan include a requirement to provide an assessment, based on the currently available survey data and literature review, of how micro-siting can further address protection of threatened, declining or special concern species, and areas with increased species richness. Examples of how to mitigate for possible impacts include measures such as avoidance of areas indicating use by species of concern, or increasing spacing between turbines based on available literature avoidance observations.

Discussion in the Avian Survey Report also included the indication that breeding birds may be disturbed if construction activities occur during the breeding season near any active nest sites. The DNR concurs with this analysis and recommends that the Avian and Bat Protection Plan include a requirement to provide a construction schedule and operational plan for construction that addresses minimization of impacts to breeding birds using the currently available survey data and literature analysis.

The applicant for the Paynesville Wind Project has requested the option for construction of either 80 meter towers or 100 meter towers. The Avian Survey Report indicates (Addendum A) that there may be more risk to waterbirds and waterfowl with 80 meter towers, and more risk to raptors with 100 meter towers, though a bias for observing lower flying birds is acknowledged due to easier visibility. This analysis would suggest that 100 meter towers are generally lower risk. It should also be considered, however, that wind towers are usually beneath a height that interferes with nocturnal migration (see pg. 28). If tower heights of 100 meters are constructed along with a rotor diameter large enough to bring the total height to 150 meters or over, a possibility described in Addendum A, then there may be some concern regarding nocturnal migration, particularly for songbirds (passerines). It is unclear how the change in height would affect avian species at the Paynesville site. The DNR recommends that post-construction fatality studies be designed in a manner that considers a comparison of various heights of towers within the site if different heights are used, or between wind resource sites if the same height of towers is used. Radar studies could be included in the Avian and Bat Protection Plan or in a regional study to further explore the possible impact of larger towers on migrating birds. Regarding bats and turbine height, it is interesting to note that in a study at the Buffalo Mountain wind project in Tennessee 65 meter towers were found to kill fewer bats than 78 meter towers (Arnett, et al, 2008). The DNR also recommends that post-construction bat fatality studies consider turbine height to the extent possible.

The applicant for the Paynesville Wind Project also completed a report titled "Acoustic Bat Studies For the Paynesville-Zion Wind Resource Area – Draft Report." Generally the DNR concurs with recommendations included in this report regarding the inclusion of fatality monitoring post-construction. DNR staff look forward to working with the applicant to assist with the development of monitoring protocol for the Avian and Bat Protection Plan. It should be noted that the Big Brown Bat and Little Brown Bat were located during applicant surveys. These species are under consideration for state listing as species of special concern, but are not currently listed.

The DNR also concurs with the recommendation included in the report titled "Avian Surveys for the Paynesville Wind Resource Area" that post-construction monitoring should be used to evaluate setbacks from WMAs and WPAs, and if substantial mortality should occur, additional mitigation measures should be implemented. DNR staff look forward to working with OES and the applicant to discuss the most effective post-construction monitoring methods for this site.

Thank-you for your consideration of these recommendations. Please contact me with any questions.

References:

Arnett, et al. 2008. Patterns of Bat Fatalities at Wind Energy Facilities in North America.

Deinlein, Mary. Smithsonian Institute. Fact Sheet: Neotropical Migratory Bird Basics. http://nationalzoo.si.edu/scbi/migratorybird/fact_sheets/default.cfm?fxsht=9

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Blvd E.
Bloomington, Minnesota 55425-1665

November 9, 2010

Ingrid Bjorklund
State Permit Manager
Minnesota Office of Energy Security
85 7th Place East, Suite 500
St. Paul, Minnesota 55101

Re: Paynesville Wind Farm Avian Survey and Addendum A Review
Stearns County, Minnesota
FWS TAILS #32410-2009-FA-0144

Dear Ms. Bjorklund:

This letter is to follow up a November 1, 2010, conference call involving Minnesota Department of Natural Resources (MNDNR), Geronimo Wind Energy, HDR Consulting, Hamer Environmental, yourself, and Rich Davis of this office, regarding the proposed Paynesville Wind Farm in Stearns County, Minnesota. The comments and recommendations within this letter are focused on information provided in the Avian Surveys for the Paynesville Wind Resource Area, September 2009 – September 2010, report. This letter serves as additional comments and recommendations to our preliminary review letter provided to the project proponent, dated October 22, 2009 and our previous letter submitted to your office on September 2, 2010.

The following comments are being provided pursuant to the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act, and the Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, turbine site selection, project design, turbine model selection, and compliance with applicable laws.

Migratory Birds

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds.

In past correspondence and during the November 1, 2010 conference call Rich Davis indicated concerns with the line of turbines proposed between the Lake Henry/Bauman Waterfowl Production Areas (WPAs) and the Zion WPA, and the potential impacts of these turbines on migratory birds within the project area. Based on the final Avian Survey Report survey, Station 7 is located within the area of concern, and Station 7 does have the highest bird count totals when compared to the other nine survey stations within the proposed project site. Over half of these individuals counted consist of Brewer's blackbirds, Franklin's gulls, and ring-billed gulls during the fall aggregation and migration period. The seasonal movement of birds through this area appears to be significant during late September and October, and does warrant further consideration of appropriate turbine model selection and turbine spacing to allow for movement of migratory bird species.

At this time the Service recommends that the project proponent utilize a turbine model with a 100 meter hub height. The taller hub height moves the bottom of the Zone of Risk (ZOR) farther from ground level, which allows greater clearance for low elevation avian flight beneath the rotor swept area. The Service also recommends that turbines placed between the Lake Henry/Bauman WPAs and the Zion WPA maintain an appropriate alignment so any birds approaching the turbines from the east or west can easily fly past the turbines without significant flight avoidance of the turbines. Michael DeRuyter recommended a turbine spacing of 200 to 600 meters in this area, in a November 2, 2010 email. This spacing does seem to be appropriate to allow avian movement through the area.

Avoidance of turbine placement within grasslands will also be beneficial to a number of grassland nesting bird species with aerial courtship displays (marbled godwit, northern harrier, common nighthawk, and upland sandpiper) which may utilize the proposed project site.

The Service's Office of Law Enforcement serves its mission to protect federal trust wildlife species in part by actively monitoring industries known to negatively impact wildlife, and assessing their compliance with Federal law. These industries include oil/gas productions sites, cyanide heap/leach mining operations, industrial waste water sites, and wind power sites. There is no threshold as to the number of birds incidentally killed by wind power sites, or other industry, past which the Service will seek to initiate enforcement action. However, the Service is less likely to prioritize enforcement action against a site operator that is cooperative in seeking and implementing measures to mitigate take of protected wildlife.

Service-owned Lands

The Zion Waterfowl Production Area (WPA) is located directly adjacent to the east boundary of the proposed project area. The Lake Henry and Bauman WPAs are located directly west of the proposed project area. The Service recommends a minimum turbine setback distance of ½-mile from all WPAs adjacent to the proposed Paynesville Wind Farm.

Post-construction Surveys

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. The Service recommends that surveys be conducted for a minimum of two years following construction to assess impacts to birds species moving through the project area. All turbines placed within ½-mile of any lands managed or set aside for migratory birds should be included in post-construction monitoring. Turbines selected for inclusion in post-construction monitoring surveys should be a combination of turbines within various habitat cover types.

We also recommend that the post-construction mortality studies be conducted by an independent third-party contractor with expertise in bird/bat mortality monitoring. Results of mortality surveys and other forms of monitoring should be used to adjust operations to reduce mortality if necessary and feasible, as well as improve design and siting of future wind generation facilities. **The Developer or its contractor should provide to this office each year, no later than December 31, copies of annual bird/bat mortality monitoring reports.**

Thank you for the opportunity to provide comments on this proposed project. Please contact me at (612) 725-3548, ext. 2201, or Rich Davis, Fish and Wildlife Biologist, at (612) 725-3548, ext. 2214, if we can be of further assistance.

Sincerely,

Tony Sullins
Field Supervisor

cc: Jamie Schrenzel, MN DNR
Scott Glup, USFWS - Litchfield WMD