STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

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J. Dennis O'Brien	Commissioner
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Phyllis Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of Pleasant Valley Wind, LLC for a Site Permit for a 301 Megawatt Large Wind Energy Conversion System in Dodge and Mower Counties	**ISSUE DATE:** **DOCKET NO. IP-6828/WS-09-1197** **FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER, ISSUING A SITE PERMIT TO PLEASANT VALLEY WIND, LLC FOR THE PLEASANT VALLEY WIND PROJECT**

The above-entitled matter came before the Minnesota Public Utilities Commission (Commission) on November 23, 2009, pursuant to an application submitted by Pleasant Valley Wind, LLC (Pleasant Valley or Applicant) for a site permit to construct, operate, maintain, and manage the Pleasant Valley Wind Project (Project), a 301 Megawatt (MW) nameplate capacity Large Wind Energy Conversion System (LWECS), including associated facilities, in Dodge and Mower counties.

All of the proposed wind turbines and associated facilities will be located in Dodge and Mower counties. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection system, feeder or collector lines, and two permanent meteorological towers. The energy from the proposed 301 MW Project will be delivered from three project substations via three transmission lines, which are anticipated to be permitted locally by Mower County, to the existing Pleasant Valley Substation in Pleasant Valley Township in Mower County.

STATEMENT OF ISSUE

Should the Applicant be granted a site permit under Minnesota Statutes section 216F.04 to construct a 301 MW Large Wind Energy Conversion System in Dodge and Mower counties?

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

FINDINGS OF FACT

Background and Procedure

1. Pleasant Valley submitted a site permit application to construct the proposed 301 MW Pleasant Valley Wind Project in Dodge and Mower counties. Pleasant Valley is a wholly owned subsidiary of Renewable Energy Systems Americas Inc. (RES Americas).[1]

2. On November 23, 2009, Pleasant Valley filed an application with the Public Utilities Commission for up to 300 megawatts of nameplate wind power generating capacity identified as the Pleasant Valley Wind Project in Dodge, Mower, and Olmstead counties.

3. 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 provided that the Applicant file a revised application containing supplemental information.[2]

4. On January 19, 2010, a Commission Order was issued accepting the application for the Pleasant Valley Wind Project provided that the Applicant submit a revised application containing the information requested by OES EFP.[3]

5. On February 3, 2010, OES EFP staff issued a notice of application acceptance and scoping meeting.[4] On February 5, 2010, the Applicant submitted a second revised LWECS site permit application.[5] This notice was posted on eDockets on February 12, 2010, and on the Commission's web site on February 9, 2010.

6. 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 *Rochester Post-Bulletin* on February 6, 2010, *Austin Daily Herald* on February 12, 2010, the *Meadow Area News* on February 10, 2010, the *LeRoy Independent* on February 10, 2010, and the *Hayfield-Dodge Center Star Herald* on February 10, 2010.[6] 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; however, the first publication was 18 days after application acceptance.

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[1] Exhibit 1 at 4.
[2] Exhibit 2.
[3] Exhibit 3.
[4] Exhibit 4.
[5] Exhibit 1.
[6] Exhibit 6.

7. On February 9 and 10, 2010, the Applicant distributed copies of the site permit application and notice of application acceptance to certain government agencies and landowners within the Project boundary.[7] The application distribution met the requirements of Minnesota Rule 7854.0600, subpart 3. The notice was distributed only to those who received the application pursuant to subpart 3. Therefore, not every township board and city council within Dodge, Mower, and Olmstead counties received a notice as required in subpart 2. County boards, city councils, and townships boards in the vicinity of the Project area received notice just past 15 days. All township boards and city councils within Dodge and Mower counties were notified of the availability of the draft site permit as stated in Finding 12.

8. The public comment period was extended to March 15, 2010.[8] Public comments on the site permit application and issues to consider in the development of a draft site permit were accepted until March 15, 2010. EFP staff received 26 comments, including comments from the Department of Natural Resources, the Department of Transportation, Mower County, Dodge County, and the city of Austin.[9] Approximately 125 people attended two public meetings that were held on February 22, 2010, in Dexter, Minnesota, 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 meetings was posted on eDockets.[10]

9. On April 8, 2010, EFP staff recommended that a draft site permit be issued and distributed for public comment.[11]

10. On April 23, 2010, a Commission Order made a preliminary determination that a draft site permit may be issued.[12] The Commission denied a request for a contested case, but expanded the scope of the public hearing that will be held on the certificate of need proceeding to include siting matters related to the draft site permit to the extent feasible.[13]

11. On May 26, 2010, the Applicant posted on eDockets an updated map excluding Olmstead County from the Project boundary.[14]

12. On June 9, 2010, EFP staff issued a notice of public hearing and availability of draft site permit and environmental report.[15] This notice was posted on eDockets on June 11, 2010. The notice met the requirements of Minnesota Rule 7854.0900, subpart 1. Notice was sent to interested persons and government agencies as required by Minnesota Rule 7854.0900, subpart 2.[16] The deadline for submitting comments on the draft site permit was July 16, 2010.

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[7] Exhibit 5.
[8] Exhibit 4.
[9] Exhibit 8.
[10] Exhibit 9.
[11] Exhibit 11.
[12] Exhibit 12.
[13] *Id.*
[14] Exhibit 13.
[15] Exhibit 14.
[16] *Id.*

13. Published notice of the public hearing and availability of the draft site permit and environmental report appeared in the *Rochester Post-Bulletin* on June 18, 2010, *Austin Daily Herald* on June 18, 2010, the *Meadow Area News* on June 16, 2010, *Hayfield-Dodge Center Star Herald* on June 18, 2010, and the *EQB Monitor* on June 14, 2010, as required by Minnesota Rule 7854.0900, subpart 2.[17] Notice also appeared on the Commission web site on May 14, 2010.

14. A public hearing was held on the evening of July 1, 2010, in Austin, Minnesota, presided over by Administrative Law Judge Manual Cervantes from the Office of Administrative Hearings. Approximately 85 people attended the public hearing. Twenty-five people offered testimony. A court reporter prepared a record of the public hearing.[18]

15. On August 3, 2010, Administrative Law Judge Manual Cervantes filed his "Summary of Public Testimony.[19] Written comments were also posted on eDockets.[20] Written comments from the Minnesota Department of Natural Resources were filed separately.[21]

Certificate of Need

16. 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]

Project Description

17. The Project will be comprised of up to 188 General Electric (GE) 1.5 MW wind turbine generators with the WindBOOST Control System, which is a software upgrade that will be applied to the physical GE 1.5 MW turbine effectively boosting the 1.5 MW turbine to a 1.6 MW turbine, or 130 Siemens 2.3 MW wind turbine generators.[23] The Project name plate capacity will be 299 MW if the Siemens turbines are selected or 300.8 MW if the GE turbines are selected.[24] Associated facilities will include wind turbine access roads, underground electrical collection system, SCADA wiring, feeder or collector lines, pad mounted turbine transformers, and up to two meteorological towers. The Project's turbine locations are shown on maps posted on eDockets on July 2 and 12, 2010.[25]

18. Three Project substations and up to three transmission lines will connect the Project to the transmission grid at the existing Pleasant Valley Substation.[26] A 6.4 mile 138 kV high voltage transmission line will extend from the north substation and a 7.0 mile 138 kV high voltage transmission line will extend from the south substation, which will both

[17] Exhibits 15 and 16.
[18] Exhibit 21.
[19] Exhibit 22.
[20] Exhibit 19.
[21] Exhibit 20.
[22] Exhibit 1 at 6.
[23] Exhibit 1 at 17; Exhibit 18.
[24] *Id*.
[25] Exhibit 17.
[26] Exhibit 1 at p. 2.

connect to the third proposed substation.[27] A 345 kV high voltage transmission line of less than 1,500 feet in length will be constructed from the third proposed substation to the Pleasant Valley Substation.[28]

19. The Project substations and transmission lines are being permitted locally by Mower County.[29] An operations and maintenance building will be constructed within the Project area, which is also being permitted locally by Mower County.[30]

20. The turbine towers will be 262.5 feet (80 meters) in height.[31] The total height of the tower and blade at the 12:00 position will be approximately 398 feet (121.25 meters) for the GE turbine and approximately 428 feet (130.5 meters) for the Siemens turbine. The rotor diameter for the GE turbine is 271 feet (82.5 meters) and the rotor swept area is 57,540 square feet (5,346 square meters).[32] 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).[33] 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 55.92 miles per hour.[34] 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 55.9 miles per hour.[35]

21. The GE and Siemens turbines have a similar rotor and nacelle design.[36] The rotor consists of three blades mounted to the hub, which is attached to the nacelle that houses the main components of the wind turbine, including the gearbox, general, and the main control panel.[37] 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.[38]

22. Two foundation designs (spread footing and pier type foundations) are under consideration, and the final design will depend on the results of the geotechnical study.[39] Each turbine foundation will account for the site specific soils and subsurface conditions.[40] A formal geotechnical investigation will be performed at each turbine site with a drill to analyze conditions and test for voids and homogeneous ground conditions.[41] Each turbine will have a step-up transformer to raise the voltage and transfer it to the 34.5 kV underground collection system.[42]

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[27] *Id*. at 19.
[28] *Id*.
[29] *Id*.
[30] *Id*. at 20.
[31] *Id*. at 17.
[32] *Id*.
[33] *Id*.
[34] *Id*.
[35] *Id*.
[36] *Id*. at 15.
[37] *Id*.
[38] *Id*.
[39] *Id*.
[40] *Id*.
[41] *Id*.
[42] *Id*. at 17-18.

23. The Project currently has six temporary meteorological towers and two permanent meteorological towers will be installed as part of the associated facilities for this LWECS Project. The two permanent meteorological towers will be free standing 50 to 80 meter towers, made of galvanized steel, and lighted as required by the Federal Aviation Administration.[43]

24. All turbines and two 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.

25. Pleasant Valley expects to begin commercial operation in December 2012.[44] The estimated Project costs are estimated between $2,100/kW to $2,400/kW, depending on final turbine selection engineering and layout.[45]

<u>Site Location, Characteristics, and Topography</u>

26. The proposed Project will be located in Mower and Dodge counties, in Hayfield (sections 31, 34) and Vernon (Section 31) townships in southern Dodge County and Waltham (sections 1, 3, 10-15, 25, 26, 36), Sargeant (sections 3, 6-12, 15-20, 24, 25, 27-29, 32-34, 36), Pleasant Valley (sections 9, 10, 16-18), Red Rock (sections 1, 2, 11-13, 15, 24-26), and Dexter (sections 2-6, 8-11, 17-23, 26-30) townships in northern Mower County. The Project area is located approximately six miles northeast of Austin, Minnesota, and fifteen miles west of Rochester, Minnesota. The Project site encompasses approximately 70,000 acres, which is primarily agricultural land.[46] Over 98 percent of the Project area is cropland.[47] Some farmers raise livestock, principally hogs, but there are also dairy, beef, and turkey farms.[48] Elevation varies from 1,275 to 1,385 feet above mean sea level.[49] The Project area is nearly level to gently sloping with a few areas having slopes more than 6 percent.[50] Wind turbine and access roads are sited to take into account the contours of the land to minimize impact.

27. Construction of the turbines sites and access roads will involve temporarily disturbing land within the Project area. Temporary access roads will be approximately 36 feet wide and permanent access roads will be approximately 20 feet wide using crushed rock with

[43] *Id*. at 20.
[44] *Id*. at 81.
[45] *Id*. at 80.
[46] *Id*. at 20.
[47] *Id.* at 64.
[48] *Id.* at 20.
[49] *Id*. at 58.
[50] *Id*. at 60.

eight-foot compacted shoulders.[51] Total miles of access roads will range from 32 to 42 miles, depending on final turbine layout.[52]

Wind Resource Considerations

28. Wind monitoring within the Project area indicates that the long-term predicted mean wind speed for the Project is 7.45 meters per second (16.67 miles per hour) at 58 meters (190 feet).[53] Pleasant Valley expects a range of long-term mean annual 80 meter (262 feet) wind speeds will be 8.38 to 8.31 meters per second (18.74 to 19.26 miles per hour).[54] 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.

29. For this Project, turbines will be generally be 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 the 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.

30. According to the application, projected average net annual output will be approximately 1,050,000 to 1,130,000 MWh (megawatt hours), using either the GE 1.5 MW turbine with WindBOOST and the Siemens 2.3 MW turbine.[55]

Wind Rights and Easement/Lease Agreements

31. 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

[51] *Id*. at 19.
[52] *Id.*
[53] *Id*. at 12.
[54] *Id*. at 1.
[55] *Id*. at p. 2.

encompass the proposed LWECS, including all associated facilities such as access roads, meteorological towers, and electrical collection system.

32. The Applicant has executed easement agreements that grant Pleasant Valley the necessary wind rights for the construction and operation of the Project. Within the approximately 70,000 acres site, the Applicant has easement agreements for approximately 52,000 acres, which provide over 99 percent of the required land for turbines and associated facilities. 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

33. 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 preservation, sustainable development, and the efficient use of resources.[56] 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.[57] Therefore, environmental review is based on the application and the record. The following analysis addresses the relevant considerations that are to be applied to a LWECS project.

Human Settlement

34. The site is in an area of relatively low population density, which is characteristic of rural areas throughout southeastern Minnesota. The town of Sargeant, with a population of 74, is the only incorporated city within the Project boundary.[58] The towns of Hayfield with a population of 1,338, Waltham with a population of 191, Brownsdale with a population of 702, and Dexter with a population of 324 are all within one mile of the Project area boundary.[59]

35. The Applicant has committed to a setback of 1,000 feet to all residences, regardless of whether that landowner is a participant in the Project, and has a setback goal of 1,500 feet.[60] The Applicant stated it will consider setbacks of less than 1,500 feet if the landowner has consented to the setback.[61] Section 4.2 of the site permit incorporates this setback. Pleasant Valley will also be required to set back its turbines a minimum of five

[56] Minn. Stat. § 216F.03 and Minn. R. 7854.0500.
[57] Minn. R. 7854.0500, subp. 7.
[58] Exhibit 1 at 20.
[59] *Id*.
[60] *Id*. at 14.
[61] *Id*.

rotor diameters (between 1,335 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 813 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. Pleasant Valley's proposed Project design must comply with the Minnesota Pollution Control Agency (PCA) noise standards pursuant to Minnesota Rules Chapter 7030. As a result, the impact of the proposed Project on human settlement and public health and safety will be minimal. Section 4.4 of the site permit contains conditions for setbacks from residences and roads. The proposed wind turbine layout will meet or exceed those requirements.

36. There will be no displacement of existing residences or structures in siting the wind turbines and associated facilities.

Noise

37. 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. Higher levels exist near roads and other areas of human activity.[62] Wind turbines, when in motion, generate sound or noise. The level of sound (noise) varies with the speed of the turbine and 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 will increase noise levels. However, increases in noise levels are expected to be minimal due to the noise levels produced by the wind itself.

38. Noise impacts to nearby residents and other potentially affected parties will be factored into the turbine micro-siting process. The Applicant must demonstrate the Project can meet the noise standard pursuant to Minnesota Statutes chapter 7030 (site permit, sections 5.1 and 6.6). Noise levels predicted by a noise modeling program will be compared to the PCA Daytime and Nighttime L_{10} and L_{50} 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. The nighttime L_{50} limit of 50 dBA is the most applicable stringent state limit.

39. The Applicant analyzed noise for the GE 1.5 MW turbine with WindBOOST and the Siemens 2.3 MW turbine using CadnaA software, which implements the methods of the ISO 9613 and allows the creation of three-dimensional acoustical models.[63] According to the manufacturers' noise data, sound power levels measured at a 10 meter height for an

[62] *Id*. at 28.
[63] Exhibit 23.

80 meter hub height is 106 dBA for the GE turbine and 108 dBA for the Siemens turbine.[64] The Applicant applied a 2 dB margin of error to the GE turbine analysis. The modeling analysis used for both turbines assumed that the temperature was 10 degrees Celsius, the relative humidity was 70 percent, the ground absorption coefficient was 0.7, and the search radius was 5,000 meters.[65] Cumulative noise impacts resulting from multiple turbine strings were analyzed and maps are provided in Exhibit 23. The modeling conducted by the Applicant concluded that sound levels for both turbine layouts are expected to be below 50 dBA at all receptors.[66]

40. Section 6.6 of the site permit requires Pleasant Valley 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

41. The issue of shadow flicker was raised during both public comment periods.[67] 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 shallow 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.

42. 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.[68] 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. Wisconsin is considering a shadow flicker standard of a maximum of 30 hours that would apply to non-participating residences and occupied community buildings, but those rules have not yet been formally adopted.

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[64] *Id.*
[65] *Id.*
[66] *Id.*
[67] Exhibits 8, 9, and 22.
[68] 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.

Several jurisdictions in other countries have established guidelines for acceptable levels of shadow flicker based on certain assumptions.

43. The Applicant filed its shadow flicker modeling summary, which is Exhibit 24. EAPC Architects and Engineers conducted shadow flicker modeling for the Project. Pleasant Valley is using a guideline of 1,500 feet setback from residences, and no residence will be closer than 1,000 feet from a wind turbine (see section 4.2 of the site permit). Non-participating residences will be setback 1,500 from turbines unless a waiver is signed by the landowner. Based on the consultant's experience conducting shadow flicker studies, the Applicant anticipates that shadow flicker is minimized by utilizing the 1,500 foot setback guidelines from residences and the relatively dispersed nature of the turbines.[69] The shadow flicker modeling include several conservative assumptions: all receptors are omni-directional (i.e., a greenhouse), all houses will have a direct view (i.e., without trees or buildings), and shadow flicker from wind turbines up to 6,562 feet was included even though shadow flicker will be a very low intensity beyond 3,281 feet.[70]

44. Less than 10 percent of the receptors using the Siemens layout and less than 12 percent of the receptors using the GE layout are expected to receive more than 10 hours per year of shadow flicker based on a realistic modeling scenario.[71] Most of these receptors will experience shadow flicker in increments up to 30 minutes per day.[72] Nearly half of the 1,508 receptors in the Project area will not be affected by shadow flicker or will receive less than one hour per year of shadow flicker under both turbine layouts.[73]

Visual Values

45. The placement of up to 188 GE 1.5 MW turbine with WindBOOST or 130 Siemens 2.3 MW turbines for the Pleasant Valley Wind Project will affect the appearance of the area. The wind turbines will be mounted on tubular towers that are approximately 262 feet tall. The rotor blades will have a diameter between 271 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 Interstate 90, Trunk Highways 56 and 30, County Highway 7, and nearby roads.[74]

46. 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.

[69] Exhibit 24.
[70] *Id.*
[71] *Id.*
[72] *Id.*
[73] *Id.*
[74] Exhibit 1 at 33-34.

47. 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. Numerous wind facilities already exist in Mower and Dodge counties. Further, wind generation development is likely to continue in Mower and Dodge counties.

48. Visually, the Pleasant Valley Wind Project will be similar to other LWECS projects located in the area.

Public Health and Safety

49. The Rochester International Airport, the Austin Municipal Airport, and the Dodge Center Municipal Airport are located in the vicinity of the Project.[75] A Federal Aviation Administration (FAA) "No-Hazard Determination" for this Project has yet to be issued. The Rochester International Airport is located 7.6 miles east of the Project, which is outside of defined safety zones, conical surface, and approach zones.[76] The Dodge Center Municipal Airport is located 3.7 miles northeast of the Project, which is outside the defined safety zones, conical surface, and approach zones.[77] The Austin Municipal Airport is located 4.5 miles southwest of the Project and the Applicant does not expect to interfere with the approaches or conical surfaces.[78] The city of Austin requested that the Applicant address any impacts that might occur to the Austin Municipal Airport as a result of the Project.[79] The Applicant will conduct aeronautical studies, in consultation with the FAA, prior to Project construction to determine if the proposed turbine locations will cause interference to the Dodge Center and Austin airports.[80] 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 of public 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).

50. A review of the AirNav, LLC (AirNav 2009) database identified six airports within 20 miles of the town of Sargeant, which is roughly in the center of the Project area. There are no airports within the Project area. There are two airports just outside the Project boundary. The Scrabeck Airport is located approximately two miles from the boundary and Petes Airport is located approximately 1,500 feet from the boundary. The wind access buffer in section 4.1 of the site permit will be applied; therefore, a wind turbine will not be located closer than 813 feet from the Project boundary. 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 of private airports as defined in rule as a restricted airport that could be privately or publicly owned, but the persons who may use the airport are determined by the owner of the airport.[81] An

[75] *Id*. at 36.
[76] *Id.* at 37.
[77] *Id.*
[78] *Id.*
[79] Exhibit 22.
[80] Exhibit 1 at 41.
[81] Minn. R. 8800.0100, subp. 24a.

obstruction would be any obstruction that would compromise the license of the private airport.[82] It is not known at this time if the Scrabeck Airport or the Petes Airport are private airports.

51. The addition of 130 to 188 wind turbines in active croplands and two permanent free standing meteorological towers 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 two permanent meteorological towers 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.

52. 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). Once energized, the proposed Project will generate electromagnetic fields.[83]

53. The proposed turbine layouts and high-voltage transmission lines will produce some level of EMFs, but will be similar to EMFs already present in the site from existing facilities.[84] As referenced in Finding 20, the transmission lines will be permitted locally, but the Applicant stated it will work with the appropriate agencies to ensure the transmission lines are installed along field edges or within road rights-of-way wherever possible.[85]

54. While there is no conclusive evidence that EMFs from power lines and wind turbines pose a significant health impact, the turbines will be installed no closer than 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.

55. 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, it remains important that the turbines are not sited in areas where regular human activity is expected below the

[82] *See* Minn. R. 8800.1900, subp. 5.
[83] Exhibit 1 at 49.
[84] *Id.*
[85] *Id.*

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).

56. The Applicant will prepare an emergency response plan (fire protection and medical emergency plan) in consultation with the emergency responders having jurisdiction over the Project area (site permit, section 7.16). As with any large construction project, some risk of worker or public injury exists during construction. Pleasant Valley 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. Pleasant Valley will also control public access to the Project during construction and operation. Pleasant Valley will provide security during construction and operation of the project, including fencing, warning signs, and locks on equipment and facilities. The Applicant will also provide landowners, interested persons and public officials and emergency responders with safety information about the project and its facilities (see site permit, sections 7.15 and 7.16).

57. 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).

Public Services and Infrastructure

58. 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).

59. 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). Pleasant Valley will work with all parties involved to address concerns related to roadway use, and adhere to state, county, and township requirements for transportation infrastructure.

60. 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 still allowing for the crossing of farm equipment. The permanent access roads would

comprise between 32 and 42 miles, depending on turbine selection.[86] All access roads will be designed to accommodate heavy loads and large cranes that are need to construct and maintain the turbines.[87] Local requirements would be followed wherever access roads join state or local roadways. During construction only, temporary access roads will be approximately 36 feet wide to accommodate delivery of turbines, towers, and other related equipment.[88] Once construction is completed, the roads will be re-graded, filled, and dressed as needed.

61. If access roads are installed across streams or drainage ways, the Applicant in consultation with Minnesota Department of Natural Resources, will design, shape, and locate the road so as not to alter the original water flow or drainage patterns. 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.

62. There is a major natural gas pipeline operated by Northern Natural Gas Company in the northern portion of the Project area.[89] The Project is not expected to impact the pipeline. To avoid impacts to the pipeline, all construction work within the right-of-way or heavy equipment crossing will be completed after an Encroachment Agreement or Encroachment Permit is obtained.[90]

63. There are two existing high-voltage transmission lines (161 kV and 345 kV) that cross the Project area.[91] The Applicant will not impact electrical services.[92]

64. The proposed Project will have approximately 149 miles of underground 34.5 kV electrical collector lines within the Project.[93] The underground lines will be installed in a trench or bored beneath roadways, pipelines, protected water, and sensitive natural areas at a minimum of five feet deep.[94] The buried lines that are laid in trenches will be bedded in sand or fine gravel before backfilled by native soils.[95] In cropland areas with agricultural drain tile, the depth of the underground lines will be below the depth of the existing drain tiles.[96] Drain tiles will be identified prior to construction to minimize damage.[97] Any damage that does occur will be repaired to the satisfaction of the landowner during construction.[98] Placement of collector and feeder lines is addressed in the site permit at section 4.15. The proposed Project is expected to have a minimal effect on the existing infrastructure.

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[86] *Id*. at 19.
[87] *Id*.
[88] *Id*.
[89] *Id*. at Map 9.
[90] *Id*. at 40.
[91] *Id*. at 35.
[92] *Id*. at 40.
[93] *Id*. at 18.
[94] *Id*.
[95] *Id*.
[96] *Id*.
[97] *Id*.
[98] *Id*.

65. 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, Pleasant Valley will make arrangements with applicable service providers to avoid interference with such facilities. There are two telephone and telecommunications operators within the Project area.[99]

66. No radio, television, or cellular communication towers are located in the Project area.[100] The presence or operation of the wind plant could potentially impact the quality of television 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. An analysis of television broadcast facilities found eight digital television and 19 FM broadcast facilities in addition to one authorized AM station within the Project area.[101] The Applicant will not operate the wind farm so as to cause microwave, radio, telephone, television, or navigation interference in violation of Federal Communications Commission regulations or other applicable law. If operation of the Project causes such interference, Pleasant Valley will take the 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 signal reception and microwave signal patterns in the Project area.

67. There are five active microwave beam paths in the Project area.[102] There is also one proposed microwave beam path by Mower County.[103] Updated turbine maps at Exhibit 17 show the proposed microwave beam path in addition to the active microwave beam paths. The Applicant's consultant recommends that turbine should not be sited within a distance to the centerline of any microwave path equal to the sum of the Fresnel Zone distance and the blade radius. The blade radius for the GE turbine is 40 meters and the blade radius for the Siemens turbine is 50.5 meters.[104] The Applicant will locate turbines to avoid interference with active and proposed microwave beam paths.[105]

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

<u>Recreational Resources</u>

69. There are no Wildlife Management Areas (WMAs) or Wildlife Production Areas (WPAs) within one-mile of the Project area.[106]

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[99] *Id*. at 36.
[100] *Id*. at 35.
[101] *Id*. at 36.
[102] *Id.* at 36.
[103] Exhibit 8.
[104] Exhibit 1 at 36.
[105] *See* exhibit 1 at 36 and exhibit 17.
[106] Exhibit 1 at 46.

70. There is one Scientific and Natural Area (SNA) within the Project area and one SNA that adjoins the Project.[107] The 35-acre Iron Horse Prairie SNA is adjacent to the Project and is located within two miles south of Hayfield on Minnesota Highway 56 and one half mile east on County Road M in Dodge County. The Iron Horse Prairie SNA is a triangular shaped site with high species diversity and is the largest example of contiguous mesic tall grass prairie in southeast Minnesota.[108]

71. The 145-acrea Wild Indigo Prairie SNA is a linear SNA that extends from Ramsey to Dexter though the Project area and located along a 12-mile strip of abandoned railroad right-of-way in Mower County.[109] Similar to the Iron Horse Prairie SNA, this SNA is one of the few mesic tall grass prairie remnants located in southeast Minnesota.[110] Due to the prevailing wind direction, wind turbines will not be located closer than five rotor diameters from the Wild Indigo Prairie SNA. Initial turbine layout maps included in the application did not reflect this setback. Exhibit 17 shows updated turbine layout maps that include the setback to the Wild Indigo SNA. Setbacks from SNAs are found at sections 4.1 and 4.5 of the site permit.

72. The Applicant intends to cross the Wild Indigo Prairie SNA with its underground collector or feeder lines within a public road right-of-way. The Applicant will secure any necessary permits to cross over, under, or across state lands.[111] Section 10.5 of the site permit addresses other permits that may be required as part of constructing a wind facility.

73. There are four grant-in-aid snowmobile trails that cross the Project area.[112] As requested by the Minnesota Department of Natural Resources, Pleasant Valley will coordinate with the trail contacts regarding trail locations and expects to be a sufficient distance from trails, as they vary from year to year, to protect trail users from hazards such as falling ice.[113]

74. While there are public waters within the Project area, none are believed to have significant recreational resources for fishing, swimming, or boating, and they are utilized principally as drainage conveyance for agricultural cropland.[114]

75. There are no local, county, state, or federal parks or recreational areas within the Project area. [115]

<u>Community Benefits</u>

76. Pleasant Valley will pay a Wind Energy Production Tax to the county and townships each year, which is expected to be approximately $1.3 million per year.[116] Landowners

[107] *Id.*
[108] *Id.*
[109] *Id.*
[110] *Id.*
[111] *Id.*
[112] *Id*. at 58.
[113] *See* exhibit 20.
[114] Exhibit 1 at 47.
[115] *Id*.

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

77. The proposed Project will permanently impact up to 160 acres of cropland and pastureland for the construction of wind turbine structures, access roads, and associated infrastructure.[117] Up to 187 acres will 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).[118] 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 operation, it may be occasionally necessary for Pleasant Valley 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.

78. The wind turbines and access roads will be located so that the most productive farmland will be left as intact as possible. However, on average each turbine and all associated access roads will permanently displace approximately 0.5 to 1.0 acre of agricultural land. The Applicant has stated it will compensate the affected landowner for any temporary impact or loss of growing crops, reclaim any cropland areas temporarily disturbed, repair drain tile damage in accordance with specific landowner agreements, and negotiate permanent loss of cropland for service roads and other associated facilities with the affected landowners.[119] Section 7 of the site permit addresses mitigation measures for agricultural lands.

79. The proposed Project does not adversely affect any sand or gravel operations.

80. Pleasant Valley will avoid impacts to Reinvest in Minnesota (RIM) land and will minimize impacts to Conservation Reserve Program (CRP) land to the extent possible. Exhibit 26 shows a map of RIM and CRP land.

Archaeological and Historical Resources

81. A review of the Minnesota State Historic Preservation Office (SHPO) computer database did not identify any archeological sites within the Project area.[120] However, three Native American sites are present within one mile of the Project area.[121] Thirteen historic structures have been identified within the Project area and four historic structures within

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[116] *Id*. at p. 27 (note that the application inadvertently stated annual energy production tax revenues for 150 MW instead of 301 MW, so the figure was doubled).
[117] *Id*. at 56.
[118] *Id*.
[119] *Id*. at 57-58.
[120] *Id*. at 41.
[121] *Id*. at 41 – 43.

one mile of the Project area.[122] These sites include churches, schools, town halls, general stores, homesteads, barns, and warehouses.[123]

82. An archaeology 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). A Phase I archaeology survey consists of the following tasks: consultation, documentation, and identification. A Phase I survey provides enough information to allow consideration of avoidance if a site is to be impacted by an undertaking and to gather enough information to allow for reasonable recommendations for more detailed work should it be necessary. At the time the Applicant submitted its application, the Phase I survey was in progress.[124]

83. If any 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

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

Wildlife

85. More than 98 percent of the Project area is used for agricultural purposes with cropland comprising a significant portion of the vegetative cover.[125] Wildlife habitat impacts are expected to be minimal because turbines and access roads will be placed exclusively on agricultural land. With proper planning, neither construction nor operation of the Project is expected to have a significant impact on wildlife. Based on studies of existing wind power projects in the United States and Europe, the only impact of concern to wildlife would primarily be to avian and bat populations.

86. According to the Applicant, the Project is not within a migratory flyway and use of the area by migratory birds is limited.[126] The Applicant is currently conducting an avian survey for the Project and impacts to bats will be determined upon completion of a desktop and field analysis.[127] Section 13.2 of the site permit requires the Applicant to

[122] *Id.* at 43.
[123] *Id.*
[124] *Id*. at 44.
[125] *Id*. at 65.
[126] *Id*.
[127] *Id*.

submit the results of its avian and bat surveys at least 30 days prior to the pre-construction meeting and document how those results will be used to inform the micro-siting process. Data from the Natural Heritage Information System (NHIS) and the North American Breeding Bird Survey (BBS) indicate that the threatened loggerhead shrike may be present in the Project area.[128] Avian impacts will be determined after the avian surveys have been completed for the Project area.[129]

87. 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 five or more dead or injured non-protected avian or bat species or a single dead or injured migratory, state threatened, endangered, species of special concern, or federally listed species discovered in the vicinity of the rotor swept area within 24 hours of discovery. 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 6.1 also requires the Applicant to submit any biological survey or studies conducted. Section 4.5 requires that turbines and associated facilities will not be constructed in wildlife management areas, state scientific and natural 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.

Rare and Unique Natural Resources

88. Some rare species have been recorded near the Project area.[130] The NHIS identified several rare vascular plants, which are listed as either endangered or threatened species, most likely to occur within the Project area's native prairie remnants.[131] Prairie remnants are likely in publicly owned areas, such as road rights-of-way, or protected areas, such as the SNAs.[132] Section 4.7 of the site permit requires the Applicant to prepare a prairie protection and management plan if native prairie could be impacted.

89. Based on NHIS review, the threatened loggerhead shrike has been observed in the vicinity of the Project area.[133] The Applicant will be required to submit studies or surveys (site permit, sections 6.1 and 13.2) and, as discussed in Finding 87, is currently conducting such avian and bat studies. Also identified in the Project area is the threatened Blanding's turtle and species of special concern, Ozark minnows and the creek heelsplitter.[134] Section 13.1 of the site permit contains a special condition that requires Pleasant Valley to follow the recommendations in the fact sheet prepared by the Department of Natural Resources for avoiding and minimizing impacts to the Blanding's turtle and distribute a summary of the recommendations to contractors and its employees.

[128] *Id.* at 66.
[129] *Id*. at 67.
[130] *Id*. at 69.
[131] *Id.*
[132] *Id.*
[133] *Id.*
[134] *Id.*

Vegetation

90. 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. As discussed in Finding 88, section 4.7 of the site permit will require a prairie protection and management plan if native prairie could be impacted.

Soils

91. 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

92. The Project area is relatively flat, partially 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. Local groundwater resources are provided by wells into bedrock aquifers that range from 150 to 350 feet deep with a few high volume wells extending up to 900 feet deep.[135] 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.

Surface Water and Wetlands

93. 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). A wetland delineation report will be completed to determine all wetland boundaries adjacent to areas of proposed turbine locations.[136]

Future Development and Expansion

94. 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 Mower and Dodge and surrounding counties additional types and sizes of wind projects supplied by different vendors and installed at different times. The

[135] *Id*. at 61.
[136] *Id.* at 63.

Applicant has indicated that it is considering Dodge 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.[137]

95. 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.

96. The Commission is responsible for siting of LWECS "in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources."[138] Section 4.1 of the site permit provides for buffers between adjacent wind generation projects to protect wind production potential.

Maintenance

97. 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. Pleasant Valley 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 Mower County.

Decommissioning and Restoration

98. The existing easement agreements between the Applicant and landowners require that all above ground wind Project facilities be removed from the Project site within one year of the expiration of the easement term.[139] This agreement also requires all physical improvements be removed if they are within three feet of final grade at the termination of the agreement.[140] 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 Project site would be restored within 18 months after Project expiration.

99. 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.

100. 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 meeting.

[137] Exhibit 10 (Applicant letter in response to Dodge County comments).
[138] Minn. Stat. § 216F.03.
[139] Exhibit 1 at 82.
[140] *Id*.

In addition to any requirements under the site permit, each individual land lease requires proper decommissioning of turbines. The owner will be responsible for costs to decommission the Project and associated facilities.

Site Permit Conditions

101. All of the above findings pertain to the Applicant's requested permit for a 301 MW LWECS project.

102. 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 for clarification or additional requirements have been made.

103. 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 Pleasant Valley Wind Project 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 Pleasant Valley Wind, LLC to construct and operate the up to 301 MW Pleasant Valley Wind Project in Dodge and Mower counties 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-6828/WS-09-1197.

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

(S E A L)

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.