

STATE OF MINNESOTA
ENVIRONMENTAL QUALITY BOARD

In the Matter of the Application of
Northern States Power Company
for a Site Permit for their
Wind Generation Resources
100 MW Phase II Project

**MINNESOTA ENVIRONMENTAL
QUALITY BOARD'S FINDINGS OF
FACT, CONCLUSIONS OF LAW AND
ORDER ISSUING SITE PERMIT**

The above-entitled matter came before the Minnesota Environmental Quality Board (MEQB) at a special meeting on October 31, 1995, pursuant to an application by Northern States Power Company (NSP) for a Site Permit to construct a Large Wind Energy Conversion System (LWECS) on Buffalo Ridge in Lincoln County, Minnesota.

STATEMENT OF ISSUE

Should Northern States Power Company be granted a Site Permit under Minnesota Statutes section 116C.694(a) to construct a Large Wind Energy Conversion System on Buffalo Ridge in Lincoln County, Minnesota?

Based upon the record and proceedings herein, and the record and proceedings of NSP's application for a Certificate of Site Compatibility for the same project, the Environmental Quality Board makes the following:

FINDINGS OF FACT

MEQB Proceedings on NSP's Site Permit Application.

1. On September 19, 1995, Northern States Power Company wrote to the MEQB and requested that its application for a Certificate of Site Compatibility also be considered an application for a Site Permit.

Compatibility record as Exhibit H. NSP has agreed to provide the MEQB with the preconstruction micrositing analysis that was performed to locate the turbine sites and with the company's estimate of total project wake losses.

12. NSP and Zond have provided the MEQB with a map showing the area within the proposed northwest site in which the project will be constructed. This map is attached to both the Certificate of Site Compatibility and the Site Permit. The area comprises approximately 11,200 acres of the approximately 24,000 acres that were included in the northwest site. After the project is actually constructed, the area required for the project will be significantly smaller than 11,200 acres.
13. NSP has also provided the MEQB with a map showing the feeder lines that are to be constructed as part of the project.

Site Permit Conditions.

14. Nearly all of the conditions contained in the permit are conditions that were established as part of the Certificate of Site Compatibility proceeding that was held under the Power Plant Siting Act and for which the Administrative Law Judge issued his report. NSP and Zond have both accepted the conditions in the Certificate of Site Compatibility.
15. A number of conditions are contained in the Site Permit that are not found in the Certificate of Site Compatibility. These include Condition A.1. [SITE PLAN], Condition B.18 [TOWER IDENTIFICATION], Condition H.1. [PROJECT ENERGY PRODUCTION], Condition H.2. [WIND RESOURCE USE], Condition I.1. [AS-BUILT PLANS AND SPECIFICATIONS], Condition I.2. [FINAL BOUNDARIES], Condition J.2. [FAILURE TO COMMENCE CONSTRUCTION], and Condition J.5. [PROPRIETARY INFORMATION].

In addition, a number of the conditions in the Site Permit that were also in the Certificate of Site Compatibility have been changed slightly or have been rearranged in the Site Permit.

16. Nearly all of the conditions in the Site Permit are acceptable to NSP and Zond. In their comment letters dated October 6, 1995, NSP and Zond raised concerns only about commencement of construction, wake loss studies, energy production reporting, and permit modification language.

Setback from Residences - Condition C.2.

17. NSP and Zond have agreed that no turbine would be constructed closer than 1000 feet to an occupied residence to ensure that no violations of Minnesota Pollution Control Agency noise standards occurs. However, allowing 1000 feet when a shorter distance would suffice could result in a sacrifice of the wind resource.

18. Neither NSP nor Zond has provided the MEQB with any information about the anticipated noise levels expected from operation of the Z46 Model turbine or with any data on the noise levels measured with other Zond turbines already in operation. It is unknown how close to a residence NSP and Zond could construct a single turbine, or a number of turbines, and still meet the noise standard at the residence, but it is expected that turbines could be constructed closer than 1000 feet.

19. Wind turbines can be constructed up to 500 feet from an occupied residence without causing any aesthetic and safety concerns. Condition C.2. allows NSP to construct wind turbines up to 500 feet of an occupied dwelling, although nothing requires NSP to site the turbines that close to occupied residences.

Setback from Wildlife Management Areas - Condition C.4.

20. The Minnesota Department of Natural Resources has requested that a setback of at least 1/4 mile from Wildlife Management Areas and other Scientific and Natural Areas be established in the permit. See DNR's letter of October 6, 1995. The reason DNR recommends the setback is to provide additional protection for birds and to minimize the visual impact from the protected area.
21. Of the 143 turbines to be constructed as part of this project, only a very few turbines, probably on the order of two or three, will be closer than 1/4 mile from any protected area. As long as NSP does not encroach upon the actual protected area with construction of a turbine, not imposing a setback requirement upon NSP will allow the company to site the turbines in the best places to utilize the wind resource.
22. The DNR is in agreement that it is not necessary to impose a setback on NSP in this particular case.

Turbine Spacing - Condition E.6.

23. Neither NSP nor Zond has provided the MEQB with any written information regarding how the companies determined that the spacing of the turbines will be at least 3.6 Rotor Diameters (RD) along the strings and 10 RD's across the strings.
24. NSP has concluded that turbines along Buffalo Ridge must be sited at significantly greater distances than turbines in California in order to prevent wake losses from occurring. Turbines in California are often spaced only one or two rotor diameters apart.
25. NSP and Zond have agreed to provide the MEQB with their preconstruction micrositing analysis leading to the final turbine arrays and with their estimate of the total project wake

losses.

Wake Loss Study - Condition F.1.

26. Neither NSP nor Zond has provided the MEQB with any written information regarding wake loss studies performed by either of these companies on any other wind power project or any projections of the wake losses expected with this project given the designed turbine arrays.
27. Wake loss is an important factor in determining whether the wind resource is being used efficiently.
28. Zond and other operators of wind power projects routinely determine the wake losses experienced with their wind projects. Zond will gather data to analyze the wake loss effect with this project after it is constructed and placed into operation. NSP and Zond have agreed to provide the MEQB with any operational wake loss studies they perform on this project.

Energy Production and Wind Resource Use Reporting - Conditions H.1. and H.2.

29. Wake loss can be determined from data on the energy output of an individual turbine and on associated wind data. Conditions H.1. and H.2. of the permit require reporting of data relating to energy production and wind use.
30. Zond, as the operator of the wind project, will have equipment in place to determine the energy output of each individual turbine on at least an hourly basis. NSP and Zond will both be collecting meteorological data in the Buffalo Ridge area on a continuous basis.
31. Data on the overall operation of a wind power project, such as the output from all 143 turbines, is not as valuable as data on individual turbine performance in evaluating the project's use of the wind resource.
32. NSP has objected to the reporting requirements of Conditions H.1. and H.2. of the permit because they claim this type of data is proprietary. However, NSP and Zond will have rights

Modification of Conditions - Condition J.3.

40. Events may occur in the future that require this permit to be modified. For example, new rules may be adopted or unanticipated environmental effects may be discovered. On the other hand, it might also be learned that a permit condition is no longer necessary.
41. NSP and Zond will have ample opportunity to participate in any proceeding intended to consider a permit modification.

Expiration Date - Condition K.

42. The expected life of the project is thirty years. An expiration date of November 1, 2028, will provide essentially thirty years from the time this project goes into operation until the permit expires.

Based on these Findings of Fact, the Environmental Quality Board 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 Environmental Quality Board has jurisdiction over the Site Permit applied for by NSP, pursuant to Minn. Stat. § 116C.694.
3. The Minnesota Environmental Quality Board has afforded all interested parties including the applicant with opportunities to participate in the development of the Site Permit and has complied with all applicable procedural requirements of Minn. Stat. § 116C.694.
4. The conditions contained in the Site Permit issued to NSP are appropriate and necessary and within the MEQB's authority.
5. The MEQB has the authority under the Wind Siting Act to establish conditions in Site Permits relating to site layout and construction and operation and maintenance of an LWECS. The MEQB is the agency directed to carry out the legislative mandate to site

LWECS in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.

6. The Conclusions of Law adopted by the Administrative Law Judge in his Report dated October 6, 1995, are hereby adopted in their entirety.


Based on the foregoing Findings of Fact and Conclusions of Law, the Environmental Quality Board makes the following:

ORDER

The Environmental Quality Board hereby issues a Site Permit to Northern States Power Company in the form attached hereto. The Site Permit authorizes NSP to construct its 100 megawatt Wind Phase II Project in Lincoln County, Minnesota, along Buffalo Ridge in accordance with the conditions contained in the Permit.

Approved and adopted this 31st day of October, 1995

STATE OF MINNESOTA
ENVIRONMENTAL
QUALITY BOARD


Cynthia Jepsen
Chair

