

**STATE OF NORTH DAKOTA  
PUBLIC SERVICE COMMISSION**

**ALLETE, Inc.  
Bison 2 Wind Project – Oliver/Morton Counties  
Siting Application**

**Case No. PU-11-57**

**PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER**

**July \_\_\_\_, 2011**

**Appearances**

Commissioners Tony Clark, Kevin Cramer, and Brian P. Kalk.

David R. Moeller, Senior Attorney, Minnesota Power, 30 West Superior Street, Duluth, MN 55802, on behalf of the Applicant.

Mitchell D. Armstrong, Special Assistant Attorney General on behalf of the North Dakota Public Service Commission.

Al Wahl, Administrative Law Judge pursuant to temporary appointment by the Office of Administrative Hearings, 1701 North Ninth Street, Bismarck, North Dakota 58501-1882, as Procedural Hearing Officer.

**Preliminary Statement**

On February 4, 2011, Minnesota Power, an operating division of ALLETE, Inc. (Minnesota Power) submitted a Letter of Intent (LOI) to submit an application for a Certificate of Site Compatibility for a 105 MW wind energy conversion facility in Morton and Oliver counties, North Dakota. Minnesota Power requested in its LOI that the Commission shorten the one-year waiting period required between filing of the LOI and the filing of an application.

On March 10, 2011, the North Dakota Public Service Commission (Commission) shortened the one-year waiting period to one day, and assessed a filing fee of \$80,000.00 due upon filing of an application.

On April 6, 2011, Minnesota Power filed an Application for a Certificate of Site Compatibility (Application) authorizing construction of the 105 MW Bison 2 Wind Project (Bison 2) consisting of up to 35 wind turbine generators and associated facilities in Morton and Oliver counties, North Dakota.

On May 18, 2011, the Commission deemed the Application complete conditioned on the filing of final wind turbine locations on or before June 30, 2011, and issued a Notice of Filing and Notice of Hearing, scheduling a public hearing for July 7, 2011, at 10:00 a.m. CDT, at the Oliver County Courthouse, 11 West Main, Center, North Dakota 58530. The Notice identified the following issues to be considered:

1. Will the location, construction and operation of the proposed facilities produce minimal adverse effects on the environment and upon the welfare of the citizens of North Dakota?
2. Are the proposed facilities compatible with the environmental preservation and the efficient use of resources?
3. Will the proposed facility locations minimize adverse human and environmental impacts while ensuring continued system reliability and integrity, and ensuring that energy needs are met and fulfilled in an orderly and timely fashion?

On June 29, 2011, Minnesota Power submitted a map detailing the proposed final locations for turbines. Minnesota Power also supplemented its Application with additional information on wetland delineation, cultural resources surveys and agency consultation.

On June 30, 2011, Minnesota Power filed an executed Certification Relating to Order Provisions – Wind Energy Conversion Facility Siting.

On July 7, 2011, the public hearing was held as scheduled. Having allowed all interested persons an opportunity to be heard, and having heard, reviewed and considered all testimony and evidence presented, the Commission makes the following:

### **Findings of Fact**

1. Minnesota Power, an operating division of ALLETE, Inc., is a Minnesota corporation and Minnesota public utility as defined under Minn. Stat. § 216B.02, subd. 4.
2. ALLETE, Inc. is registered to conduct business in the State of North Dakota, as evidenced by a Certificate of Good Standing issued by the North Dakota Secretary of State on May 13, 2011.
3. Minnesota Power proposes to construct and own a wind energy facility (the Bison 2 Wind Project) to be located in Morton and Oliver counties, North Dakota, approximately 10 miles north and northwest of New Salem, North Dakota. The project

area consists of approximately 14,500 acres (22.6 square miles). The wind turbines will be placed throughout the project site.

4. Associated facilities to be constructed within the project area include access roads, underground electrical and feeder lines, additions to an existing electrical substation, meteorological towers, wind monitoring stations, and operations and maintenance buildings.

5. North Dakota Century Code § 49-22-16 provides that no energy conversion facility site shall be designated if it violates any county or city land use, zoning, building rules, regulations or ordinances. Morton and Oliver counties require zoning permits for construction, and Minnesota Power has obtained all necessary permits.

### Project Design

6. The project will have a nameplate (gross) generating capacity of 105 MW, consisting of 35 3.0 MW wind turbines and associated facilities. Projected average annual output is estimated at 380,000 MWh per year.

7. Minnesota Power plans to use Siemens 3.0 MW turbines. These are utility-grade wind turbines with a nominal nameplate rating of 3,000 kW. Each turbine will have an 80-meter (262 feet) hub height and a 101 meter (331.4 feet) rotor diameter. Each turbine begins operating at wind speeds of 3.0 meters per second (m/s), or 8.9 miles per hour (mph), and reaches its rated capacity (3.0 MW) at a wind speed of 12 to 13 m/s (26.8 to 29.0 mph).

8. Each turbine is designed to operate at wind speeds of up to 25 m/s (55.9 mph) and can withstand wind speeds of more than 55 m/s (123.0 mph).

9. Each tower will be secured by a concrete foundation that can vary in design depending on the soil conditions. A typical foundation extends seven to ten feet below grade where it spreads to a final diameter of 50 to 70 feet at the base. Turbine lighting will be limited to warning lights required by the Federal Aviation Administration. A control panel inside the base of each turbine tower houses communication and electronic circuitry. Each turbine is equipped with a wind speed and direction sensor that communicates to the turbine control system to signal when sufficient winds are present for operation. The turbine features variable-speed control and independent blade pitch to assure aerodynamic efficiency. Electricity generated by each turbine is brought to a pad-mounted transformer where the voltage is stepped up to a power collection line voltage of 34.5 kV. This electricity is collected by sets of underground power collection lines.

10. The 34.5 kV collector system transmits power to the project collector substation. At the project substation, the power will be transformed to 230 kV and transmitted via an existing overhead 230 kV transmission line, interconnecting with the transmission grid at the existing Square Butte Substation. Electrical energy is converted from AC to DC via a

DC converter station within the Square Butte Substation. Electrical energy from the Bison 2 Wind Project will be transmitted to customers via the existing Minnesota Power DC Line which extends from the Square Butte Substation to Minnesota Power's Arrowhead Substation located near Duluth, Minnesota and on the existing AC system as available.

11. Wind data was collected from four meteorological towers constructed in the project site area. Minnesota Power expects the project will have annual average wind speeds of 8 mps (equivalent to 17.8 mph) or higher, comparable to National Renewable Energy Laboratory wind power class ratings of 5 and 6, indicating an excellent to outstanding wind resource.

12. Construction of the Bison 2 Wind Project is expected to take approximately 15 months, at a total estimated construction cost of \$157 million.

13. Minnesota Power states it has secured all wind options from landowners necessary for the construction and operations of the Bison 2 Wind Project.

14. Minnesota Power anticipates commencing construction on fall 2011, and commercial operation to begin in late 2012.

15. Safety factors will be incorporated into the wind turbines. Each turbine will be equipped with a Supervisory Control and Data Acquisitions (SCADA) communication technology to control and monitor the turbine. In addition, each turbine is equipped with a lightning protection system and is grounded and shielded to protect against lightning.

16. Construction and operation of the Bison 2 Wind Project will conform to requirements of the National Electric Safety Code.

#### Siting Criteria

17. North Dakota Administrative Code Chapter 69-06-08 sets forth certain criteria to guide the Commission in evaluating the suitability of granting an application for the certificate of site compatibility. The criteria set forth in North Dakota Administrative Code Section 69-06-08-01 are classified as Exclusion Areas, Avoidance Areas, Selection Criteria, and Policy Criteria. With the exception of prime and unique farm land, an energy conversion facility must not be sited within an Exclusion Area. The exception for prime and unique farm land is if the Commission finds that the prime farm and unique farm land that will be removed from use for the life of the facility is of such small acreage as to be of negligible impact on agricultural production, then such exclusion shall not apply. An energy conversion facility must not be sited within an Avoidance Area unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an Avoidance Area should be designated for a facility, the Commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources, and alternate sites. In accordance

with the Commission's Selection Criteria, an energy conversion facility shall be approved only if it is demonstrated that no significant adverse impacts will result from the location, construction, and operation of the facility. In accordance with the Commission's Policy Criteria, preference may be given to an applicant demonstrating certain benefits of the energy conversion facility.

18. Exhibit 8 of the Application labeled Prime Farmland Soil Distribution Map shows that approximately 3.3 percent of the site is prime farmland soils, most of it located in the southeast and northeast portions of the site. The final layout will site only a limited number of turbines and facilities in prime farmlands. Even if all the turbines and access roads were placed within prime farmland areas, only approximately 54 acres of prime farmland would be impacted, or approximately 0.1 percent of prime farmland in the Project site. Unique and prime farmland to be disturbed by this energy conversion facility is of such small acreage as to be of negligible impact on agricultural production.

19. Approximately 54 acres of agricultural production will be impacted due to turbine placement, access roads, the operations and maintenance facility and project substation. Wind turbine configuration will not result in significant impacts to agricultural production. No impacts on the agricultural quality of the crop land are anticipated. If compaction of soils occurs during construction, Minnesota Power will work with landowners to alleviate the compaction.

20. Minnesota Power submitted evidence to demonstrate that the proposed energy conversion facility would not have significant impact on the Selection Criteria set forth in North Dakota Administrative Code section 69-06-08-01(3).

21. Minnesota Power submitted evidence to demonstrate its commitment to maximize the benefits of the proposed energy conversion facility as far as is possible so as to meet the Policy Criteria set forth in North Dakota Administrative Code Section 69-06-08-01(4).

22. No significant adverse impact is foreseen on the ability of the affected area to provide community services, such as housing, health care, schools, police and fire protection, water and sewer, solid waste management, transportation, or public safety. The proposed project is expected to be of economic benefit to the affected area.

23. The only Avoidance Area identified within the project area is wetlands. Minnesota Power testified that there will be a negligible impact to wetland resources; however the impact is so minor, that notification to the US Army Corps of Engineers is not required. Minnesota Power has carefully designed the Bison 2 facilities to first avoid and then minimize impacts to wetlands.

24. According to North Dakota Geological Survey data provided by the applicant, two small underground lignite coal reserves have been identified within the project area, but no viable economic reserves have been identified within the project area.

## Cultural Resources

25. The Bison 2 Wind Project will avoid all known archaeological sites.
26. On June 28, 2011 the North Dakota State Historic Preservation Office issued a letter concurring with the conclusion of the Class III Cultural Resource Inventory for the Bison 2 Wind Project by Beaver Creek Archaeology of Mandan, North Dakota, regarding the “No Significant Sites Affected” and “No Historic Properties Affected” determinations.

## Wetlands and Wildlife

27. Minnesota Power has consulted with numerous local, state, and federal agencies, which are identified in Appendix C of the Application, and Appendix A of the June 29, 2011 Supplement. Two agencies providing significant input were the North Dakota Game and Fish Department and the United States Fish and Wildlife Service (USFWS). Neither agency has objected to construction of the project.
28. The North Dakota Game and Fish Department indicated its primary concern is with disturbance of native prairie and wetlands. Minnesota Power met with North Dakota Game and Fish Department to discuss the project area and plans to mitigate any impacts. The disturbance of native prairie and wetlands will be minimal.
29. Concerns of the USFWS focused on migratory birds, wetlands, native grasslands, and threatened and endangered species. Minnesota Power will implement measures to avoid and minimize effects to wildlife at the proposed site by locating facilities away from habitat and wetlands when possible.
30. At the request of USFWS, Minnesota Power is developing an Avian and Bat Protection Plan (ABPP) that will be implemented during construction and for post-construction monitoring. The ABPP will include protocols for field technicians to report and document avian mortalities during routine maintenance operations.
31. The whooping crane is a federally endangered species that may use the project area during their spring and fall migration. The project occurs outside of the central migration corridor flyway where 50 percent of confirmed whooping crane sighting in North Dakota have occurred, but within an 80 mile corridor where 75 percent of sightings have occurred. Impacts thought to occur primarily from the loss of stopover habitat will be minimal as only 54 acres (0.1% of the project area) will be permanently disturbed.
32. A wetland delineation was conducted for the Bison 2 Wind Project and the results were submitted to the Commission. Wetlands will be avoided to the extent practicable during the construction phase of the project. If impacts to Clean Water Act jurisdictional waters are unavoidable and less than one-half acre, Minnesota Power will seek project authorization under a Section 404 USACE Nationwide Permit (NWP) application.

Permanent impacts to jurisdictional waters will be mitigated according to USACE requirements.

#### Further Mitigative Measures

33. Morton County has established setbacks for wind turbine towers from property boundaries, road right-of-ways (ROW), and occupied residences. Each wind turbine must be no less than 1.25 times its total height, or 1,320 feet (whichever is greater) from the nearest occupied dwelling, commercial building or publicly-used structure or facility, and state and county parks. From public road and above ground transmission lines, turbines must be located no less than 250 feet from the center line of the existing ROW. And from the wind energy facility perimeter, each turbine must be set back no less than 1.0 to 1.5 times its rotor diameter. Oliver County has not established setback requirements for wind turbines.

34. No turbines will be placed within 1,400 feet of an occupied residence.

35. Minnesota Power conducted noise and shadow flicker analyses, utilizing both “worst case” and “realistic” scenarios. These studies indicated that the Project will not cause adverse effects due to either noise or shadow flicker. As shown in Late Filed Hearing Exhibit 8, the highest expected cumulative noise level at any residence is less than 50 decibels (dB). As shown in Late Filed Hearing Exhibit 9, shadow flicker models show that the participating residence with the greatest potential cumulative exposure will experience about 27 hours annually. Those same models predict that the highest level of exposure at a non-participating residence would be about 12 hours annually.

36. Minnesota Power will maintain ground water protection and soil conservation practices to protect topsoil and adjacent resources, and to minimize soil erosion during construction and operation of the project. Best management practices (BMPs) for erosion and sediment control will be used to minimize wind and water erosion in the project area during and after construction. Only land needed for the facility will be impacted. Temporarily disturbed areas will be restored.

37. Minnesota Power has a legal obligation to decommission the wind energy facilities.

38. Minnesota Power made other representations and agreements as contained in the Certification Relating to Order Provisions – Wind Energy Conversion Facility Siting executed by Minnesota Power and filed with the Commission on June 30, 2011, which is incorporated in these Findings of Fact. The Commission accepts Minnesota Power’s modification to Paragraph 16 that it shall bury all underground collection and feeder lines to a depth of at least 42 inches to the top of the lines due to Minnesota Power’s representation at the July 7, 2011 hearing about increased costs and that safety will not be compromised.

From the foregoing Findings of Fact, the Commission now makes its:

## **Conclusions of Law**

1. The Commission has jurisdiction over this proceeding under North Dakota Century Code Chapter 49-22.
2. The energy conversion facility proposed by Minnesota Power is an energy conversion facility site as defined in North Dakota Century Code section 49-22-03(11).
3. The Application submitted by Minnesota Power meets the site evaluation criteria required by North Dakota Century Code chapter 49-22.
4. The location, construction, and operation of the proposed energy conversion facility will produce only minimal adverse effects on the environment and upon the welfare of the citizens of North Dakota.
5. The proposed energy conversion facility is compatible with environmental preservation and the efficient use of resources.
6. The proposed energy conversion facility will minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.
7. The Commission has jurisdiction to ensure compliance with National Electric Safety Code standards in the construction and operation of the proposed energy conversion facility.
8. The proposed project is of such design, location and purpose that it will produce minimal adverse effects

From the foregoing Findings of Fact and Conclusions of Law, the Commission now make its:

## **Order**

The Commission orders:

1. Certificate of Site Compatibility for an Energy Conversion Facility No. \_\_\_ is issued to Minnesota Power for the construction, operation, and maintenance of a wind energy facility known as Bison 2 Wind Project in accordance with this Order.
2. The site as designated in the Application is located in Morton and Oliver counties, North Dakota, approximately 10 miles north and northwest of New Salem, North Dakota, and is designated as the site for construction of the energy conversion facility.

3. Minnesota Power is authorized to site and construct approximately 35 wind turbines totaling approximately 105 MW of wind turbines in proposed and alternate locations, along with electric collection and communication lines, a project substation, operations and maintenance buildings, meteorological towers, access roads and other associated facilities identified in the application and at the July 7, 2011 public hearing.
4. Minnesota Power shall comply with the rules and regulations of all other agencies having jurisdiction over any phase of the proposed project, including all city, township, and county zoning regulations.
5. Minnesota Power shall obtain all other necessary approvals and permits, including concurrence from the State Historic Preservation Office, and provide copies to the Commission prior to any construction activity associated with the energy conversion facility that requires said concurrence, license or permit.
6. Minnesota Power shall conduct a pre-construction conference prior to the commencement of any construction, and must include a Minnesota Power representative, its construction supervisor, and a representative of the Commission staff to ensure that Minnesota Power fully understands the conditions set forth in this Order.
7. Minnesota Power shall inform the Commission of its intent to start construction on the energy conversion facility prior to the commencement of construction, and while construction is underway, Minnesota Power shall keep the Commission updated of construction activities on a weekly basis.
8. Minnesota Power shall construct and operate the energy conversion facility in the manner described in its application, at the hearing, in the late-filed exhibits, and in accordance with all applicable safety requirements.
9. Minnesota Power shall construct the energy conversion facility in compliance with the National Electric Safety Code.
10. Minnesota Power shall report to the Commission the presence in the permit area of any critical habitat of threatened or endangered species that Minnesota Power becomes aware of and were not previously reported to the Commission.
11. If any cultural resources, paleontological resources, archeological site, historical resource, or grave site is discovered during construction of the facility, earth disturbing activities in the immediate vicinity of this discovery must be halted. The resource must be marked, preserved, and protected from further disturbance until a professional examination can be made in consultation with the North Dakota SHPO. A report of such examination must be filed with the Commission, and clearance to proceed must be given by the SHPO and the Commission.
12. All pre-existing township and county roads and lanes used during construction must be restored to a condition that will accommodate their previous use, and areas

used as temporary roads during construction must be restored to their original condition except as authorized by Morton and Oliver counties.

13. Construction must be suspended when weather conditions are such that construction activities will cause irreparable damage, unless adequate protection measures approved by the Commission are taken.

14. Reclamation, fertilization, and reseeding will be completed by Minnesota Power according to the Natural Resource Conservation Service recommendations, unless otherwise specified by the landowner and approved by the Commission.

15. Minnesota Power's obligations for reclamation and maintenance of the site shall continue throughout the life of the energy conversion facility.

16. When the energy conversion facility is retired, structures and other facilities must be removed in accordance with applicable rules and the areas restored to as near as original condition as is practicable.

17. The Certification Relating To Order Provisions – Wind Energy Conversion Facility Siting executed by Minnesota Power and filed with the Commission on June 30, 2011 is incorporated by reference and attached to this Order.

18. Minnesota Power shall repair or replace all fences and gates removed or damaged during all phases of construction and operation of the proposed energy conversion facility.

19. Minnesota Power shall repair or replace all drainage tile, broken or damaged, during all phases of construction and operation of the proposed energy conversion facility.

20. Staging areas or equipment must not be located on cultivated land unless otherwise negotiated with landowners.

21. Minnesota Power shall remove all waste that is a product of construction and operation, restoration and maintenance of the site, and properly dispose of it on a regular basis.

22. Minnesota Power shall, as soon as practicable, upon the completion of the construction of each wind turbine, restore the area affected by the activities to as near as is practicable to the condition as it existed prior to the beginning of construction.

23. Minnesota Power shall provide, if requested, educational material for landowners within the site boundaries about the proposed energy conversion facility, and any restriction or possible danger concerning the proposed energy conversion facility.

24. Minnesota Power shall provide any necessary safety measures for traffic control or to restrict public access to the energy conversion facility.

25. Minnesota Power shall advise the Commission of any extraordinary events that take place at the site of the energy conversion facility, such as tower collapse, extensive turbine failure, injured worker or private individual, mortality events of any threatened or endangered species, or the discovery of a large number of dead birds or bats on the site within five business days of such event.

26. Minnesota Power shall implement a procedure for how complaints concerning the proposed energy conversion facility will be handled by Minnesota Power.

27. All underground electric line crossing of graded roads must be bored unless the responsible governing agency permits Minnesota Power to open cut the road.

28. Where available, at least 12 inches of topsoil over and along open cut areas, roadways, tower locations, and locations of associated facilities must be stripped and segregated from the subsoil and be replaced only after the subsoil is replaced.

29. Minnesota Power shall work with landowners and residents in the area to mitigate any increase in television and residential radio interference that results from the construction of the energy conversion facility.

30. Minnesota Power shall provide the Commission with engineering design drawings showing surveyed structure and collection substation locations prior to construction, and shall obtain approval from the Commission or from Commission staff prior to any changes in those surveyed locations.

31. Minnesota Power shall provide the Commission with as-built engineering design drawings and an electronic version of the as-built drawings that can be imported into ESRI GIS mapping software within six months after construction of the energy conversion facility is complete.

32. The Certificate of Site Compatibility is subject to suspension or revocation and may, in an appropriate and proper case, be suspended or revoked for failure to comply with the Commission's Order, requirements of the One-Call Excavation Notice System under North Dakota Century Code Chapter 49-23, the conditions and criteria of each Certificate or subsequent modification, or failure to comply with the applicable statutes, rules, regulations, standards, and permits of other state or federal agencies.

33. Minnesota Power shall maintain records that will demonstrate that it has complied with the requirements of this Order and each Certificate of Site Compatibility, and that it will preserve these records for Commission inspection at any reasonable time upon reasonable notice.

34. When the facility is at the end of its useful life Minnesota Power will remove turbine structures and decommission the project area in accordance with all decommissioning rules adopted by the Commission and as delineated under North Dakota Century Code section 49-02-27.

35. The authorizations granted by each Certificate of Site Compatibility for this energy conversion facility are subject to modification by order of the Commission if deemed necessary to further protect the public or the environment.

**PUBLIC SERVICE COMMISSION**

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**Kevin Cramer  
Commissioner**

**Tony Clark  
Chairman**

**Brian P. Kalk  
Commissioner**