

Rugby Wind Farm

A Large Wind Energy Conversion System

Application to the North Dakota
Public Service Commission for a
Certificate of Site Compatibility

June 15, 2005





June 15, 2005

Ms. Illona Jeffcoat-Sacco
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard Avenue, Department 408
Bismarck, ND 58505-0480

RE: PPM Energy, Inc. Application for a Certificate of Site Compatibility for the Rugby Wind Farm, and Waiver of Procedures and Time Schedules and Consolidated Application for a Certificate of Corridor Compatibility and Route Permit for the Rugby Wind Farm Transmission Line

Dear Ms. Jeffcoat-Sacco:

Pursuant to North Dakota Century Code 49-22-08 and 49-22-08.1, under the Energy Conversion and Transmission Facility Siting Act, and promulgated rules, PPM has enclosed the following:

1. An original and ten copies of an Application for a Certificate of Site Compatibility for the Rugby Wind Farm, Docket Number PU-05-47.
2. An original and ten copies of an Application for a Waiver of Procedures and Time Schedules and Consolidated Application for a Certificate of Corridor Compatibility and Route Permit for the Rugby Wind Farm Transmission Line, Docket Number PU-05-305.

PPM previously sent to the North Dakota Public Service Commission (Commission) a check for \$85,000 for the Certificate of Site Compatibility and a check for \$13,750 for the Waiver of Procedures and Time Schedules and the Consolidated Application for a Certificate of Corridor Compatibility and a Route Permit.

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North Dakota Public Service Commission
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Commission staff requested that PPM address in this cover letter the timeline for filing a Final Plan and Profile for the proposed transmission line. PPM has proposed tower locations in the Route Permit application that are representative of the final placement particularly since PPM seeks to parallel the pole placement of Xcel's existing 230 kV transmission line that is immediately adjacent to PPM's proposed transmission line (Figure 17). PPM proposes to parallel the pole placement of the existing line to make it easier to farm around the structures of both lines. There are limited instances where PPM proposes to deviate from the pole placement of the existing line to avoid or minimize potential wetland impacts in Section 28 in Spring Lake Township, Section 33 in Torgerson Township, and Section 7 in Meyer Township.

PPM proposes to submit the Final Plan and Profile drawings at least 14 days prior to the pre-construction hearing. Waiting until after the route permit is issued before proceeding with the surveying ensures that PPM is expending its resources on a route that is approved by the Commission.

PPM believes that this approach to the Final Plan and Profile drawings is consistent with Commission Guidelines with respect to transmission siting. PPM was unable to identify any transmission siting guidelines or statutes requiring a Final Plan and Profile be submitted to the Commission before they would issue a Route Permit. Nonetheless, PPM requests that the Commission stipulate in the Route Permit that a Final Plan and Profile be submitted to the Commission at least 14 days prior to the preconstruction hearing.

Please contact me by phone at 651-917-9285 or e-mail at timothy.seck@ppmenergy.com should you have any questions with respect to this filing.

Sincerely,



Tim Seck
Manager of Midwest Renewables

cc: Michelle Bissonnette – HDR Engineering, Inc.

RUGBY WIND FARM

Case No.: PU-05-47

Application to the North Dakota Public Service Commission for a Certificate of Site Compatibility

June 15, 2005

Prepared for:



Prepared by:

HDR

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1.0 INTRODUCTION

PPM Energy, Inc. (PPM) submits this application for a Certificate of Site Compatibility (Certificate) to construct the Rugby Wind Farm (the Project). The Project is located in Pierce County, North Dakota, (Figure 1) and will be approximately 150 megawatts (MW) in size, consisting of up to 100 wind turbine generators. The application uses the General Electric (GE) 1.5 MW machine as a representative turbine for the 1.5 MW Class. The application uses the Vestas 3.0 MW machine as a representative turbine for the 3.0 MW Class. Together these two turbines span the spectrum of the turbine models in the 1.5 to 3.0 MW range. PPM may elect to select turbines by other turbine vendors in the 1.5 to 3.0 MW range. Associated facilities include a Project Substation, Operations and Maintenance building, and wind farm electrical collection system. A 230 kV transmission line associated with the Project will be evaluated in a separate application to the North Dakota Public Service Commission (Commission or PSC).

PPM develops environmentally responsible electric generation projects in the Western, Midwestern and United States. PPM owns and operates or markets the output for over 800 MW of renewable energy generation capacity, including two projects in the Upper Midwest – the 51 MW Moraine Wind Project located in Pipestone and Murray Counties, Minnesota, and the 44 MW Flying Cloud Wind Project in Dickinson County, Iowa. In addition, PPM owns gas storage and gas-fired generation facilities in the Western United States. PPM is headquartered in Portland, Oregon.

1.1 COMPLIANCE WITH THE ENERGY CONVERSION AND TRANSMISSION FACILITY SITING ACT CHAPTER 49-22

The North Dakota Energy Conversion and Transmission Facility Siting Act requires an application for a Certificate to meet the criteria set forth in North Dakota Century Code (NDCC) 49-22. The siting of an energy conversion facility is to be made in an orderly manner compatible with environmental preservation and the efficient use of resources (NDCC 49-22-02).

To the extent available, PPM has presented information required by the North Dakota Energy Conversion and Transmission Facility Siting Act. PPM has considered exclusion areas, avoidance areas, the selection criteria, and the policy criteria in the design of the Project. In addition, sufficient project design, wind resource, and technical information have been provided for a thorough evaluation of the reasonableness of the proposed site.

Table 1 outlines the information required to fulfill the requirements for a Certificate with the Commission and where these requirements are addressed in this document.

PPM will submit a Certificate of Corridor Compatibility (Corridor Certificate) and a Route Permit for a 230 kV transmission line associated with the Project in a separate application to the Commission. PPM will submit applications for Conditional Use Permits from Pierce County for the wind project and transmission line.

**Table 1
Certificate Completion Checklist**

State Authority	Description	Section
Chapter 49-22	PSC Guidelines: Energy Conversion and Transmission Facility Siting	1.1
Section A	Description	1.2, 1.3, 1.3.3, 1.5, 4.4, 6.0-6.6, 9.0
1.	Type: Describe the type of energy conversion facility proposed and provide a diagram of the major process system or a flow diagram.	1.0, 4.1, Figure 6 and 7
2.	Product: Describe in general terms and technical terms the products to be produced by the proposed facility.	1.3.4, 6.1, 6.3
3.	Size and Design: Provide the following description of the production capacity and design	1.3.4, 4.1, 4.2, 4.3, 6.0
a.	Gross design capacity;	1.3.4
b.	Net design capacity;	1.3.4
c.	Estimated thermal efficiency of the energy conversion process and the assumptions upon which the estimate is based;	N/A
d.	The number of acres that the proposed facility will occupy; and	1.3.3, 4.2, 4.3, 5.1
e.	One (1) copy of all design data reports separate from the application.	Appendix B
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following:	1.4
a.	Certificate of Site Compatibility;	1.4
b.	Land acquisition complete;	1.4
c.	Construction start date;	1.4
d.	Construction complete;	1.4
e.	Test operations;	1.4
f.	Commercial production date;	1.4
g.	100 percent capacity factor; and	1.4
h.	Any expansion or additions.	1.4

State Authority	Description	Section
Section B	Studies	
	Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state or local agency.	Appendix C
Section C	Need for Facility	2.0
1.	An analysis of the need for the proposed facility based on present and projected demand for the product or products to be produced by the proposed facility, including the most recent system studies supporting the analysis of the need.	2.1
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	Location	1.3.3
1.	Select a study area, which includes the proposed facility site, of sufficient size to enable the Commission to evaluate the factors addressed in Section 49-22-09, NDCC.	1.3.1, 1.3.2, 10.0-10.11, Figures 2 and 3
2.	Discuss the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	Appendix A
3.	Identify and map the criteria that led to the proposed facility location within the study area.	Figures 2 and 3, 1.3.3, 3.0
4.	Discuss in detail the relative value of each criteria and how the proposed facility location was selected giving consideration to all criteria.	3.0
5.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	3.0
a.	Exclusion areas;	3.1, Figures 3 and 15
b.	Avoidance areas;	3.2, Figures 3 and 17
c.	Selection criteria;	3.3
d.	Policy criteria;	3.4
e.	Design and construction limitations; and	3.5
f.	Economic considerations.	3.6

State Authority	Description	Section
6.	Discuss the mitigative measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	7.2.3, 7.3.3, 7.4.3, 7.5.3, 7.6.3, 7.7.3, 7.8.3, 7.9.3, 7.10.3, 7.11.3, 7.12.3, 7.13.3, 7.14.3, 7.15.3, 7.16.3, 7.17.3, 7.18
7.	List the qualifications of the people in the various disciplines that contributed to the facility site location study	11.0
8.	Maps	Figures
a.	Map the criteria within the study area showing the proposed facility location. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures
b.	Furnish one Mylar map, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	Figures (PSC Staff supports not providing a Mylar map)
NDCC 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	10.0
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	10.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	10.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	10.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	10.4
5.	Alternatives to the proposed site, corridor or route which are developed during the hearing process and which minimize adverse effects.	10.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	10.6
7.	The direct and indirect economic impacts of the proposed facility	10.7

State Authority	Description	Section
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	10.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	10.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	10.10
11.	Problems raised by federal agencies, other state agencies, and local entities	10.11

1.2 FLEXIBILITY IN SITING

Wind facility siting is a process through which input is considered from several different entities. When considering where to locate the wind farm in North Dakota, PPM originally identified four study areas. These study areas were identified based on expected wind resource and transmission availability. Next PPM conducted a “fatal flaw” analysis for the top two study areas. The fatal flaw analyses looked at environmental conditions at each study area and also further assessed wind resource and transmission. The Rugby study area was identified as an optimal site from environmental, wind resource, transmission, and economic perspectives.

The next step in the development process was to secure the site by entering into agreements with landowners that were interested in having PPM place wind turbines and associated facilities on their property.

Once a site was selected and secured, the next step in the process was to identify preliminary turbine locations based on initial site inspection, topographic maps, known environmentally sensitive areas, review of the North Dakota’s power plant siting exclusion and avoidance areas, review of Pierce County wind siting requirements, and communications with Local, State and Federal agencies. These preliminary turbine locations are presented in this application for a Certificate. This preliminary site plan is the commonly accepted standard for applications in other jurisdictions. PPM is not seeking a permit for each wind turbine indicated on the map. Instead, the preliminary layout indicates areas of the site with good wind resource and no known siting issues.

PPM suggests that the Certificate define the site, maximum number of turbines and other structures related to wind generation to be located in the site. Within the permitted site, PPM proposes to locate turbines and other structures related to wind generation subject to required setbacks from environmentally sensitive areas, roads, residences or other setbacks described in the permit.

Once the Commission issues the Certificate, PPM would complete the studies required by the Certificate or PPM's siting process including microwave beam path analysis, geotechnical studies, wetland, biological, and cultural resource surveys. PPM would also further evaluate the site based on efficient construction of the Project. In addition, PPM would seek further input from landowners regarding the location of wind facilities. Once these additional studies and communications are completed, preliminary turbine and access road locations are re-evaluated for their appropriateness with the Certificate conditions and buffers. A final site plan for the 150 MW project would be submitted to the Commission prior to construction and a pre-construction meeting held with Commission staff to ensure that the site plan conforms to the Certificate requirements.

Wind project siting is unique in that the project occupies a large area and must not only conform to Certificate conditions but must also optimize the wind resource at the site. Ideally, the Certificate provides the parameters within which the developer may optimize the site. With Certificate conditions in place, the developer is able to proceed with planning and development. Early approval of a Certificate is not only consistent with circumstances unique to wind project siting but it is also essential to timing given the uncertainty and limited duration of the federal production tax credit necessary for wind project development.

PPM believes that the aforementioned siting process is consistent with North Dakota siting rules and provides PPM the flexibility necessary to develop a timely, cost-effective project in an environmentally responsible manner. PPM previously submitted a letter to the Commission requesting this kind of flexibility in permitting and siting the proposed wind farm (Appendix D). PSC staff prepared a memo dated March 8, 2005 on PPM's proposed siting and permitting approach and concluded that the proposed approach is acceptable (Appendix D). On March 8, 2005 the Commission agreed with staff that PPM's approach was workable.

1.3 PROJECT SUMMARY

PPM studied potential wind resource locations in North Dakota for siting a 150 MW wind generation facility. Based on this review, PPM selected a study area north of Rugby, North Dakota for additional study and preparation of a Certificate to the Commission.

1.3.1 Project Study Area Alternatives

A study area alternative near Harvey, North Dakota was considered during initial project planning. The potential site was also located in Pierce County in Hillside, Truman, and White townships. The study area was similar in general land uses to the Project study area, and is a lightly populated, rural area. Much of the area was planted in row crops and grasslands for grazing of livestock. The Harvey study area was not selected due to exclusion areas within the site, including threatened and endangered species and unique habitat.

1.3.2 Project Study Area Selection

Figure 2 identifies the Study Area vicinity analyzed to select the proposed Project Study Area. The Study Area was identified as optimal from wind resource, transmission interconnection, environmental, and economic perspectives. In reviewing the Study Area vicinity, to the west of the Study Area the land is level and lower in elevation with less desirable wind resources. South of the Study Area the City of Rugby and Rugby Municipal Airport are not compatible land uses with the Study Area. Additionally, cities are avoidance areas. East of the Study Area there is higher elevation, but it is farther from the interconnection point. The higher elevation might seem to be a good location for turbines; however, variability in elevation is important when determining the quality of the wind resource. The area north of the Study Area does have topographical qualities that are desirable when selecting wind sites, but the distance to the transmission interconnection point is greater, which would increase the cost of the Project. Additionally, expanding to the north of the Study Area increases the complexity of the permitting because the Project would extend into adjacent Rolette County. The proposed Study Area was selected considering the exclusion and avoidance criteria outlined in North Dakota Administrative Code (NDAC) 69-06-08 and was chosen as the location for the proposed wind generation site.

1.3.3 Proposed Site

The Project Study Area is the location where leases from landowners have been obtained for the Project site. The Project site was selected to include all areas within the Project Study Area so PPM can optimize wind resources, transmission interconnection opportunities, and economic factors, while avoiding and minimizing impacts to the environmental resources. The Project site is located in Pierce County within the following Township, Range, and Sections (Table 2):

**Table 2
Project Site Location**

Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

The Project site is approximately 46,080 acres (72 mi²) and the southern border of the site is located approximately four miles north of the City of Rugby. The turbines will be placed throughout the Project site. The Project site's location and preliminary site layout is shown in Figures 4 and 5. However, the Project site will generally occupy less than one percent of the total land area.

1.3.4 Projected Output

The Project will have a nameplate (gross) capacity of approximately 150 MW. Assuming net capacity factors of between 35 and 40 percent, projected average annual output is estimated at between 460,000 to 525,000 MWh. As with all wind projects, output is dependent upon wind resource, final design, site-specific features, and equipment.

1.4 PROJECT SCHEDULE

The commercial operation date is dependent upon permitting, power purchase agreements (PPA), Production Tax Credit (PTC) approval and other development activities. The PTC is set to expire at the end of 2005. PPM believes that the PTC will be extended beyond 2005 for at least one to two years. PPM is targeting construction for 2006 provided the PTC is extended sometime in 2005, PPM secures a PPA(s) and it has received all pre-construction permits and approvals.

1. Certificate of Site Compatibility: PPM anticipates the Certificate will be approved in late July or August 2005.
2. Land Acquisition: PPM has secured sufficient easements from landowners to develop a 150 MW project.
3. Permits: PPM is responsible for undertaking all required environmental studies, and will obtain all permits and licenses that are required following issuance of the Certificate. Completing permits is on the “critical path” for the project and will allow PPM to move forward with other commitments on the Project including ordering long-lead time equipment.
4. Equipment Procurement, Manufacture and Delivery: PPM will order the wind turbine components as soon as practicable.
5. Construction: If the Project proceeds in 2006, project construction will likely begin in May or June, subject to road restrictions and weather. The engineering, procurement, and construction (EPC) contractor will be responsible for completing all Project construction, including roads, wind turbine assembly, electrical, and communications work. The construction will take approximately five months to complete.
6. Test and Operations: Testing would be in approximately August/September.
7. Commercial Operation: PPM expects commercial operation will occur in November/December 2006.

As discussed in Section 1.3.4, the capacity factor is dependent upon the final design equipment and site-specific features. The capacity factor for typical wind farms in the area is approximately 35 to 40 percent.

No expansions or additions are anticipated at this time for the Project.

1.5 PROJECT OWNERSHIP

It is anticipated that PPM will construct and own all equipment and associated facilities related to the Project. PPM will likely select a third-party contractor to perform the majority of the EPC of the wind farm. PPM, however, will procure the turbine/tower package directly from a manufacturer.

The interconnection study has commenced on the Midwest Independent System Operator (MISO) interconnection queue position associated with the Project. An interconnection agreement is anticipated in the summer of 2005.

2.0 NEED FOR FACILITY

2.1 NEED ANALYSIS

According to the Department of Energy, coal generation is the primary energy source in the State. Of the 4,699 MW of energy generated in 2002 in North Dakota, 87 percent was generated using coal facilities. According to the report (PanAero Corporation 1999) prepared for the State of North Dakota Division of Community Services, “North Dakota is motivated to become a leading state in non-polluting wind generated electricity. North Dakota’s goals include the following: general economic development, new wind project investments and construction, new landowner income, and new long-term jobs from broad professional services (such as wind project design, wind resource monitoring, legal and accounting services), from commercial project Operations & Maintenance, and from the manufacturing of wind turbine components.” In support of this effort, PPM is cooperating with regional utilities to add wind generation to their energy portfolio.

North Dakota has been identified as having more available wind for development than any other state. In recent years the Mid-Continent Area Power Pool (MAPP) has consistently reinforced the regional need for increased generating capacity in the coming decade. Cost fluctuations and reliability problems serve to reinforce the need for sufficient capacity, low-cost energy, and diverse generation sources. Independent power producers such as PPM are widely recognized as essential to meeting regional energy needs, stabilizing energy costs, and enhancing energy reliability. The Project offers North Dakota and the MAPP/MISO region the opportunity to add to capacity adequacy requirements, to stabilize wholesale power prices, and to provide electricity from a clean, cost-effective renewable energy generation facility.

There is a critical need for additional energy production in the MAPP/MISO region. The May 1, 2002, MAPP Load and Capability Report stated that, under the minimum reserve requirements, deficits were expected as soon as 2005. MAPP members were urged to build additional capacity in order to maintain reserve levels higher than the MAPP minimum. The subsequent MAPP report, dated May 19, 2004, indicated that deficits are now expected by 2010. Table 3 outlines the MAPP surplus/deficit forecasts through 2013.

Table 3
MAPP Summer Season Surplus/Deficit*

Year	MW	Reserve Margin Percentage
2004	1839	20.0%
2005	1250	18.9%
2006	921	17.8%
2007	1583	19.9%
2008	1417	19.3%
2009	1118	18.2%
2010	-94	14.4%
2011	-819	12.2%
2012	-1487	10.3%
2013	-2060	8.7%

* From Pages III-3 and III-4 of the MAPP 2004 Load and Capability Report

While the deficits have been identified, the new sources to fill these voids have not. North Dakota has a unique opportunity to begin providing capacity to meet those forecasted deficits with clean, efficient, renewable energy. The Project intends to be a significant source of energy for meeting the region's needs over the next 30 years.

2.2 ALTERNATIVES

Feasible technology alternatives to wind include generation using coal, natural gas, or biomass. No technology alternatives were considered, because these other technologies do not meet the state's goal of adding new wind energy. However, site alternatives were identified, as described in Sections 1.3.1 and 3.0.

2.3 TEN-YEAR PLAN

PPM will file a Ten-Year Plan with the Commission by July 2005.

3.0 SITE SELECTION CRITERIA

PPM is evaluating the proposed 46,080-acre (72 mi²) site to determine the best locations for up to 100 wind turbines. Siting turbines is a process through which input from several different entities is considered. Initially, several study areas were considered based on the expected wind resources and transmission availability. The Rugby Study Area was singled out as an optimal site from an environmental, wind resources, and economic perspective (Figure 2). South of the site the City of Rugby and Rugby Municipal Airport are areas that are not compatible land uses with the site. Additionally, cities are avoidance areas. East of the site there is higher elevation, but it is further from the interconnection point. The higher elevation might seem to be a good location for turbines; however, variability in elevation is important when determining the quality of the wind resource. The area north of the proposed site does have topographical qualities that are desirable when selecting wind sites, but the point of interconnection distance is increased, which increases the cost of the Project. Additionally, expanding to the north of the proposed site increases the complexity of the permitting because the Project would extend into adjacent Rolette County.

PPM secured voluntary wind option agreements with landowners and then identified preliminary turbine locations based on site inspection, topographic maps, known environmentally sensitive areas, review of North Dakota's power plant siting exclusion and avoidance areas, review of Pierce County wind siting requirements, and communications with Local, State, and Federal agencies. PPM has used this siting process in recent wind turbine projects, including projects in Minnesota. Through this process, PPM not only addresses environmental issues that commonly arise during project development, but also works within the parameters of State rules. North Dakota has several site selection criteria that are considered by the Commission to determine suitability of the site. PPM has reviewed the criteria in Chapter 69-06-08 and has factored these criteria into site design. These criteria are discussed in this section.

3.1 EXCLUSION AREAS

Per Section 69-06-08-01-1, the following geographical areas (Table 4) shall be excluded in the consideration of a site for an energy conversion facility, and shall include a buffer zone of a reasonable width to protect the integrity of the area. Exclusion areas are mapped for the Study Area vicinity in Figure 2 and for the Project site area in Figure 3.

**Table 4
Exclusion Areas**

Exclusion Area	Present within Project Site?	Proposed Buffer	Section Addressed
Designated or registered national areas: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	Present	PPM is consulting with the USFWS. PPM recommends establishing a buffer of 0.25 miles from Waterfowl Production Areas.	7.9, 7.14, 7.15, Figures 2, 3 and 9
Designated or registered state areas: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.	None		7.8, 7.9, 7.17
County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.	None		7.9
Prime farmland and unique farmland, as defined by the land inventory and monitoring division of the soil conservation service, United States department of agriculture, in 7 C.F.R. part 657; provided, however, that if the Commission finds that the prime farmland and unique farmland 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 productions, such exclusion shall not apply.	Present	No buffer is proposed. Prime farmland has been avoided to the extent practicable. Impacts to prime farmland will affect less than 0.1% of the yearly production for the top five commodities in Pierce County.	7.10, 7.11, Figures 15 and 16
Irrigated land	Present	No conflicts with irrigated land are anticipated. One parcel of land with an irrigation permit was identified within the Project site. PPM will avoid this parcel of land. No impacts are anticipated.	7.10, Figures 3 and 17
Areas critical to threatened or endangered animal or plant species	None	No areas critical to threatened and endangered species have been identified in the Project site.	7.17
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.	None	No unique or rare areas have been identified in the Project site. PPM is working with USFWS and ND Game and Fish Dept. to avoid potential impacts.	7.13, 7.14, 7.15, 7.17

3.2 AVOIDANCE AREAS

Per Section 69-06-08-01-2, the following geographical areas (Table 5) shall not be approved as a site for an energy conversion facility 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 alternative sites. Avoidance areas are mapped for the Study Area vicinity in Figure 2 and for the Project site area in Figure 3.

Table 5
Avoidance Areas

Avoidance Areas	Present within Project Site?	Proposed Buffer	Section Addressed
Historical resources which are not designated as exclusion areas	Unknown	In consultation with the North Dakota SHPO, a professional archaeologist would establish buffers appropriate to the resource, once turbine locations have been established and resources have been identified.	7.8, Appendix C.6
Areas within the city limits of a city or the boundaries of a military installation	None		7.3, Figures 2 and 3
Areas within known floodplains as defined by the geographical boundaries of the hundred-year flood	None		7.13
Areas that are geologically unstable	None		7.12
Woodlands and wetlands	Present	PPM recommends a buffer of 500 feet to protect the large wetland complexes and associated resources on the site. All other wetland resources will be avoided to the extent practicable. Woodland impacts are not anticipated. If woodland impacts occur, individual trees or shrubs will be replaced at a 2:1 ratio and will be kept alive for five years.	7.14, 7.15, Figures 3, 14 and 17
Areas of recreational significance which are not designated as exclusion areas	None		7.9

3.3 SELECTION CRITERIA

Per Section 69-06-08-01-3, a site shall be approved in an area only when it is demonstrated to the Commission by the applicant that any significant adverse effects resulting from the location, construction, and operation of the facility in that area, as they relate to the following, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum (Table 6).

**Table 6
Selection Criteria**

Selection Criteria	Potential Adverse Effects	Section Addressed
The impact upon agriculture:		
Agricultural production	For the 1.5 MW turbines, approximately six acres of land will be impacted due to turbine placement and an additional 62 acres due to the access roads. Approximately 3 acres of land would be impacted for 3.0 MW turbines and an additional 48 acres for access roads. Both configurations would result in a insignificant impacts to agricultural production.	7.10
Family farms and ranches	No turbines will be placed within 750 to 800 feet of family homes. Land area lost to the construction of access roads and turbines and aesthetic impacts are the potential adverse effects to family farms; however, wind lease payments to farmers will provide a supplemental source of income.	7.2, 7.3, 7.10, Figures 3, 4 and 5
Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	No owner, where impacts are expected, has expressed concerns related to economically suitable irrigation on their land.	7.10, Figures 16 and 17
Surface drainage patterns and ground water flow patterns	No impacts to surface drainage patterns or groundwater flow patterns are anticipated.	7.12, 7.13, 7.14, Figure 17
The agricultural quality of the cropland	No impacts to the agricultural quality of the cropland are anticipated. If compaction of soils occurs during construction, PPM will work with the landowners to alleviate the compaction.	7.10
The impact upon the availability and adequacy of:		
Law enforcement	No impacts are anticipated.	7.4
School systems and education programs	No adverse effects are expected.	7.4
Governmental services and facilities	Governmental services and facilities will not be impacted.	7.4
General and mental health care facilities	General and mental health care facilities will not be impacted.	7.4
Recreational programs and facilities	No impacts are anticipated.	7.4
Transportation facilities and networks	During construction an increase in vehicle trips per day is anticipated for approximately 6 months. During facility operation no significant impacts are anticipated.	7.4, Figures 4 and 10

Selection Criteria	Potential Adverse Effects	Section Addressed
Retail service facilities	No adverse impacts anticipated.	7.4
Utility services	PPM will utilize station service from the local electrical utility. MISO will suggest appropriate configurations for the electrical system, and PPM will abide by the recommendations to prevent impacts to the transmission system.	2.0, 7.4
The impact upon:		
Local institutions	No impacts are anticipated.	7.4
Noise sensitive land uses	The noise sensitive land uses within the Project site are the residences near turbine locations. As long as no turbines are sited within 750 feet of a sensitive land use for the 1.5 MW turbines or 800 feet for the 3.0 MW turbines, noise levels will not exceed the allowable 50 dBA standard.	7.6, Figures 3, 4, 5 and 11
Rural residences and businesses	No turbines will be placed within 750 to 800 feet of family homes.	7.2, 7.3, 7.10, Figures 3, 4 and 5
Aquifers	No impacts are anticipated.	7.12
The impact upon:		
Human health and safety	If mitigative measures are implemented as discussed in Section 7.5.3 and maintenance schedules are met, no impacts to human health and safety are anticipated.	6.3, 6.5.2, 6.5.3, 7.5
Animal health and safety	No impacts to livestock are anticipated from operation of the facility. Based on biological surveys there is a potential for small numbers of avian and bat collisions with the turbines for the Project, but the impact is expected to be minimal. Mitigative measures in turbine siting will minimize the potential for these impacts. PPM will conduct pre-construction avian monitoring and post-construction monitoring for avian and bat species.	7.10, 7.16, 7.17, Appendix C.3 and C.4
Plant life	For the 1.5 MW turbines, approximately 68 acres of land will be used for the turbines and access roads. For the 3.0 MW turbines and access roads approximately 51 acres of land will be used. The land where the turbines will be sited is primarily agricultural.	7.10, 7.15, Figure 14
Temporary and permanent housing	Temporary housing will be utilized during construction. No adverse impacts are anticipated.	7.2
Temporary and permanent skilled and unskilled labor	No adverse effects are anticipated.	7.2
The cumulative effect of the location of the facility in relation to existing and planned facilities and other industrial development	No impacts are anticipated to existing and planned facilities and other industrial development.	7.3

3.4 POLICY CRITERIA

Per Section 69-06-08-01-4, the Commission may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices (Table 7).

**Table 7
Policy Criteria**

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
Recycling of the conversion byproducts and effluents	None	N/A
Energy conservation through location, process, and design	PPM is developing the site to maximize the energy output. PPM will develop a site layout that optimizes wind resources while minimizing the impact on land resources and any potentially sensitive areas. Wind-powered electric generation is entirely dependent on the availability of the wind resource at a specific location. The energy available from the wind increases at the third power of the wind speed. In other words, a doubling of the wind speed will increase the available energy by a factor of eight times.	4.2
Training and utilization of available labor in this state for the general and specialized skills required	PPM will use local labor to the extent practicable.	7.2.2
Use of a primary energy source or raw material located within the state	The energy generated at the site will utilize the wind resources of the state of North Dakota.	5.2
Non-relocation of residents	No residents will be relocated as a result of the Project.	7.2, 7.3, 7.10
The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management	The Project will not interfere with adjacent land uses. As such, it is not anticipated that areas adjacent will be dedicated to recreation, agriculture, or wildlife management issues.	7.3, 7.9, 7.10, 7.16, 7.17, Figure 18
Economies of construction and operation	PPM will utilize local contractors to the extent practicable.	7.2
Secondary uses of appropriate associated facilities for recreation and enhancement of wildlife	None	N/A
Use of citizen coordinating committees	PPM will work with landowners of properties for the Project.	8.0
A commitment of a portion of the energy produced for use in this state	Energy transmitted will be sold at the Rugby Substation busbar to a regional utility.	2.1, 6.1
Labor relations	No labor relations will be affected.	7.2
The coordination of facilities	Existing facilities and facility corridors were considered in the location of the wind farm and the associated facilities.	3.0, 3.6
Monitoring of impacts	PPM and EPC will practice BMPs during construction to monitor soil impacts and segregate topsoil. PPM will monitor tree and shrub replacement for five years, if needed. Preconstruction monitoring of avian species is being conducted. Additionally, PPM proposes to monitor avian and bat species for one-year following construction.	7.11, 7.15, 7.16

3.5 DESIGN AND CONSTRUCTION LIMITATIONS

In general there are two design and construction limitations when building any wind farm: wind resources and landowner easements. The wind resource is essential to selecting and designing a wind farm. PPM conducts a thorough analysis of sites they select to ensure that the site has ample wind energy to generate revenue for the wind farm. Easements are another limitation to the design and construction of the Project. PPM secured voluntary land agreements with landowners necessary to develop the wind project.

Specific to the Project, there are several additional items that are limiting factors when designing and constructing the Project. Pierce County has established setbacks from property boundaries, road right-of-way (ROW), and occupied residences. PPM proposes setbacks from transmission lines consistent with their experience in developing other wind farms. These setbacks limit the amount of land available for wind development. In addition, as noted in Section 3.6, proximity to adequate transmission is key to wind project siting.

The (U.S. Fish and Wildlife Service) USFWS administers fee title Waterfowl Production Areas (WPA) and wetland and grassland easements on private property as part of their National Wildlife Refuge System. There are limitations to construction on these lands, and construction is not allowed in WPAs. PPM proposes setbacks from WPAs and large wetland complexes. Any direct impacts to wetlands or grasslands within USFWS easements will result in a compatibility assessment by local USFWS staff. The process considers the magnitude of the impact, the type or quality of the habitat which is impacted, and the feasibility of avoiding the impact. If compatibility is found, a ROW permit will be issued for the impact. Figure 9 identifies the USFWS wetland easements and land holdings within the Project site.

3.6 ECONOMIC CONSIDERATIONS

Economics were considered when selecting a location for the Project. As discussed above, it is important to select a site with a wind resource capable of generating energy. The Rugby Wind Farm has ample wind resources in the area. Information on the wind resource at the site is discussed in Sections 5.2 and 5.3.

Another factor that is considered in relation to economics is the availability of a transmission system in the vicinity of the Project site. Furthermore, having permission to interconnect into an existing transmission system is essential. If no transmission system is present, the cost of interconnection increases due to the need of constructing a lengthy transmission line and large substation to an existing electricity service provider. There are currently two transmission systems in the Project site. The first is owned by Central Power and is a 115 kV transmission line. The second is a 230 kV transmission line owned by Xcel Energy, which interconnects at the Rugby Substation owned by Otter Tail Power Company and Central Power. PPM has filed an interconnect request with MISO that will allow a connection into the Rugby Substation.

One of the most important economic considerations related to the Project is the need to qualify for the PTC. The Federal PTC is approximately 1.8 cents per kWh for 10 years. The Project would not be viable without receiving the PTC, which is set to expire at the end of 2005. It is expected that the PTC will be renewed at some point. PPM expects the PTC to be extended for at least one to two years. Approval of permits will help ensure PPM is ready to build the Project when the PTC is extended for the next period of time.

4.0 GENERAL DESCRIPTION OF THE PROPOSED FACILITY

4.1 WIND POWER TECHNOLOGY

As the wind passes over the blades of a wind turbine, it creates lift and causes the rotor to turn. The rotor is connected by a hub and main shaft to a system of gears, which are connected to a generator. Exact turbine models are subject to change to ensure selection of a turbine that is both cost effective and optimizes land and wind resources. PPM is proposing to use wind turbines in the 1.5 MW to 3.0 MW size range. If PPM selects a 1.5 MW turbine, 100 turbines would be used, while the selection of a 3.0 MW turbine would result in the use of 50 turbines. PPM proposes to finalize its turbine choice when it submits its final site plan to the Commission prior to construction.

The application uses the GE 1.5 MW machine as a representative turbine for the 1.5 MW Class. The application uses the Vestas 3.0 MW machine as a representative turbine for the 3.0 MW Class. Together these two turbines span the spectrum of the turbine models in the 1.5 to 3.0 MW range. PPM may elect to select turbines by other turbine vendors in the 1.5 to 3.0 MW range.

The GE Wind Energy 1.5 MW utility-grade wind turbine has a nominal nameplate rating of 1,500 kW. Each turbine will have an 80-meter (262 ft) hub height and 70 to 82 meter (231 to 269 ft) rotor diameter (RD) (Figure 6). The GE 1.5 MW turbine begins operation in wind speeds of 3 m/s (6.7 mph) and reaches its rated capacity (1.5 MW) at a wind speed of 11.8 m/s (26.4 mph). The turbine is designed to operate in wind speeds of up to 25 m/s (45 mph) and can withstand sustained wind speeds of over 45 m/s (100 mph).

On the other end of the size spectrum is the Vestas V90-100 3.0 MW turbine. The 3.0 MW turbines have a rating of 3,000 kW. Each turbine will have an 80 to 105 meter (262 to 345 ft) hub height and a 90 meter (295 ft) RD (Figure 6). The 3.0 MW turbine begins operation in wind speeds of 4 m/s (8.9 mph) and reaches its rated capacity (3.0 MW) at a wind speed of 15 m/s (33.6 mph). The turbine is designed to operate in wind speeds up to 25 m/s (45 mph) and can withstand sustained wind speeds of over 42.5 m/s (95 mph).

Each tower will be secured by a concrete foundation that can vary in design depending on the soil conditions. 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's control system to signal when sufficient winds are present for operation. Both turbines feature variable-speed control and independent blade pitch to assure aerodynamic efficiency.

The electricity generated by each turbine is brought to a pad-mounted transformer where the voltage is raised (stepped up) to power collection line voltage of 34.5 kV. The electricity is collected by a system of underground or overhead power collection lines within the Project site. Both power collection lines and communication cables will be buried in trenches or may be constructed as overhead lines on private property or public ROW. Typically, this infrastructure is run adjacent to the Project access roads or along

public ROWs or easements. In cases where such infrastructure must be sited on property that is not governed by the existing wind easement and land lease options, PPM will obtain easements for the necessary property.

Each wind turbine will be accessible via all-weather Class 5 gravel roads approximately 16 feet in width providing access to the turbines via public roads. At the point where the access and public roads meet, the communication and power lines will either rise from underground to overhead lines or continue as underground feeder lines. Figure 7 is a diagram of the path of energy from the wind farm to energy users. Figure 8 shows a typical wind farm facility layout. The feeder system distributes power to the Project Substation. At the Project Substation, the power will be transformed to 230 kV and transmitted via overhead 230 kV transmission lines, interconnecting with the transmission grid at the Rugby Substation.

The Project Substation and interconnection into the Rugby Substation will conform to MISO standards.

4.2 WIND FARM PROJECT LAYOUT

PPM will develop a site layout that optimizes wind resource while minimizing the impact on land resources and any potentially sensitive areas.

Wind-powered electric generation is entirely dependent on the availability of the wind resource at a specific location. The energy available from the wind increases at the third power of the wind speed. In other words, a doubling of the wind speed will increase the available energy by a factor of eight times. Analysis of wind direction data suggests that the optimal turbine string alignments are from west to east and from west-northwest to east-southeast. Design of the turbine array and collection system will minimize energy loss due to wind turbine wakes and turbulence and electrical line losses.

Pierce County has established setbacks of wind turbine towers from property boundaries, road ROWs and occupied residences. PPM will request a Conditional Use Permit seeking variances from four Pierce County setback requirements. Pierce County established setbacks from all property lines of 200 feet or the fall down area of the turbine, whichever is greater. PPM proposes to meet this setback between a property owner under lease with PPM and an adjacent landowner that is not part of the wind project. However, PPM seeks to avoid this setback if the landowners on both sides of the property line are under lease with PPM. Pierce County ordinances also limit turbine height to 300 feet. PPM will request a Conditional Use Permit that would allow turbine heights up to 345 feet. In addition, Pierce County has established a noise standard of 50 decibels (dBA) at each property boundary. PPM seeks to modify this requirement to 50 dBA at occupied residences which is a more common standard in other jurisdictions. Pierce County requires the collection system to be underground. PPM seeks the flexibility to use aboveground collection lines to cross a steep gully, for example. Alternatively, PPM seeks the flexibility to use an aboveground collection system when collecting energy from strings of turbines over five miles away.

Based on experience with other wind farms, PPM is using setbacks of 500 feet from large wetland complexes, 0.25 miles from USFWS WPAs, and 400 feet from transmission lines. The USFWS has reviewed the proposed buffers for large wetland complexes and the WPAs. The USFWS has

acknowledged that its land management jurisdiction does not extend beyond the resource and it has stated that these setback distances are suitable for the resources at the site. Table 8 identifies the most conservative setbacks applicable to the Project.

**Table 8
Setback Distances for Wind Turbines**

Setback Type	Distance
Property Boundary	400 feet ¹
Occupied Residence	750 feet (1.5 MW); 800 feet (3.0 MW)
Large Wetland Complexes	500 feet
USFWS Waterfowl Production Area (WPA)	0.25 miles
Road ROW	400 feet
Transmission Line	400 feet

¹ Setback distance applies to properties on neighboring land not under lease with PPM.

4.3 ASSOCIATED FACILITIES

In addition to the wind turbines and the step-up transformers, the Project will include several miles of gravel access roads that allow for easy access to the wind turbines year-round. These roads will be approximately 4.9 meters (16 feet) wide and low profile to allow cross-travel by farm equipment. PPM will work closely with the landowners in locating access roads to minimize land use disruptions to the extent possible. Consideration will be taken in locating access roads to minimize impact on current or future row crop agriculture, grazing and environmentally sensitive areas.

An Operations and Maintenance (O&M) building will be constructed in the middle of the Project site pending the interconnection study and the location of the Project Substation. The O&M building and Project Substation will be located in Section 28 of Spring Lake Township. See Section 6.5.4 for a description of the O&M building.

The electricity generated by each turbine is stepped up by a pad-mounted transformer at the base of each turbine to power collection line voltage of 34.5 kV. The electricity generated at each turbine is collected by a system of underground or overhead power collection lines within the Project site and brought to the Project Substation.

The substation will be a 230/34.5 kV substation and will facilitate the relaying of the wind-generated energy to the Rugby Substation along a new 230 kV transmission line. The footprint of the Project Substation and O&M building will be approximately three acres located on 10 acres of land.

PPM has constructed five meteorological towers within the Project site boundaries. It is anticipated that the site will include one permanent meteorological tower.

4.4 LAND RIGHTS

PPM has obtained wind rights and easements for a 150 MW project. Land rights will encompass the proposed wind farm and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access, underground collector and feeder lines and overhead transmission lines located on public roads when necessary, and possibly land to mitigate environmental impacts incurred due to development.

5.0 PROPOSED SITE

5.1 IDENTIFICATION OF PROJECT SITE

In addition to wind resource considerations, the Project site was selected based on its close proximity to existing transmission infrastructure, an existing substation, and landowners' interest in participating in the Project. Land-use patterns and environmentally sensitive features were factored into the site selection criteria. The site boundary encompasses an area of approximately 46,080 acres. However, the land occupied by the wind farm would be less than one percent of this area, assuming up to 100 turbines and access roads. It is anticipated that the area of direct land use for the turbines and associated facilities would be approximately 68 acres and this would include approximately 32 miles of 16-foot wide gravel access roads for 1.5 MW turbines. If 3.0 MW turbines are used, approximately 51 acres of direct land use will be required for the turbines and associated facilities. This includes approximately 25 miles of 16-foot wide gravel access roads. See Section 7.0 for a detailed description of the Project and site impacts. Figures 4 and 5 show preliminary turbine locations for the 1.5 MW turbines, which are subject to change during micrositing.

5.2 WIND RESOURCE AREAS – GENERAL

The United States Department of Energy (DOE) and the North Dakota Division of Community Services have conducted wind resource assessment studies in North Dakota. The May 2004 DOE wind map for the state of North Dakota indicates that the wind resources within the Project vicinity are Class 3 and Class 4 winds. Class 3 wind resources have an average annual wind speed of 12 miles per hour, whereas Class 4 winds have an average annual wind speed of 13 miles per hour.

PPM has reviewed and analyzed meteorological information for the Pierce County area and the Project site. This information is described in Section 5.3.

5.3 WIND CHARACTERISTICS IN PROJECT SITE

PPM has one meteorological tower in the Project site, located in Section 26 of Township 158N, Range 72W, which has been collecting data since the middle of 2004. Recently, four additional meteorological towers were constructed on the site. The data from the Project site was supplemented using data from a meteorological tower in Rolla, ND. This meteorological tower is located approximately 25 miles north of the site and has been collecting data since the middle of 2003. In addition, PPM has secured information from other long-term references to aid in correlating the wind data on-site. WindPRO and WASP software were used to analyze the available wind data from the Rolla meteorological tower and make corrections for the site effects (topography, surface roughness, and obstacles) to produce a site-independent characterization of the local wind climate. The resulting local wind climate was applied in

conjunction with the Project site effects to predict the spatial wind variations at the Project site. Various site layouts and wind turbine generator parameters can be tested to predict the energy production and array efficiency to optimize the site layout and turbine selection. Project site data has been compared to the long term Rolla data and other regional wind measurements using a parallel time period. There is a good correlation between the long-term wind measurements and the short-term Project site wind measurements. Based on the available data, the Rolla and Rugby Wind Farm sites can be judged as having similar wind climates.

6.0 ENGINEERING AND OPERATIONAL DESIGN ANALYSIS

This section provides a summary description of the Project, which includes a description of the Project layout, turbines, electrical system, and associated facilities. A summary of this information is included in the Design Data Report (Appendix B). Additional information addressed in this section is project construction, schedule, operation, and decommissioning of the site. Currently, PPM wishes to preserve the right to evaluate and select turbine equipment of varying sizes and outputs. There are other turbines that are feasible choices for the Rugby site that are available from various manufacturers, and include turbines up to 3.0 MW in size. Turbine type may affect the number and configuration of the turbine array.

6.1 RUGBY PROJECT LAYOUT AND ASSOCIATED FACILITIES

The Project will consist of an array of wind turbines, transformers, and roads. The turbines will be interconnected by communication and electric power collection cable within the wind farm. In addition, the wind farm facilities will include feeder lines, a Project Substation, and a 230 kV transmission line that will deliver the electricity to the Rugby Substation.

Land will be graded on-site for the turbine pads. Drainage systems, access roads, storage areas, and O&M facilities will be installed as necessary to fully accommodate all aspects of Project construction, operation, and maintenance.

The electrical system design and interconnection details will be determined as a result of studies and discussions with MISO. The feeder system will deliver the power to the Project Substation which will transform the energy to 230 kV and will be transmitted via an overhead transmission line to the Rugby Substation.

The Project includes a computer-controlled communications system that permits automatic, independent operation, and remote supervision, thus allowing the simultaneous control of many wind turbines. PPM will be responsible for Project operation and maintenance for the life of the Project. PPM will contract with the most appropriate supplier of operations and maintenance services at the time of operation, to assure timely and efficient operations. PPM will maintain a computer program and database for tracking each wind turbine's operational history.

6.2 DESCRIPTION OF WIND TURBINES

PPM anticipates using up to 100 1.5 MW turbines. PPM seeks the flexibility to select the most appropriate technology at the time for the Project to ensure optimization of wind and land resources and cost efficiency. The preliminary site layout is based on 100 1.5 MW wind turbines. PPM will update the site layout, consistent with the parameters laid out in the Certificate, when equipment is selected and if information regarding the wind resource identifies opportunities to further optimize the site. As stated in

Section 6.0, other turbines up to 3.0 MW in size are also under consideration. A comparison of the smallest turbine under consideration, the 1.5 MW generator and the 3.0 MW generator are presented below.

6.2.1 Turbine

In this application PPM provides information on the GE 1.5 MW machine as a proxy for the 1.5 MW class of turbine. Figure 6 represents the components of a typical wind turbine. The GE 1.5 MW turbine begins operation in wind speeds of 3 m/s (6.7 mph) and reaches its rated capacity (1.5 MW) at a wind speed of 11.8 m/s (26.4 mph). The turbine is designed to operate in wind speeds of up to 25 m/s (45 mph) and can withstand sustained wind speeds of over 45 m/s (100 mph).

As with the 1.5 MW machines, in this application, PPM provides information on the Vestas V90 3.0 MW wind turbines as an example of a 3.0 MW class of turbine. They have a rating of 3,000 kW. Figure 6 represents the components of a typical wind turbine. The 3.0 MW turbine begins operation in wind speeds of 4 m/s (8.9 mph) and reaches its rated capacity (3.0 MW) at a wind speed of 15 m/s (33.6 mph). The turbine is designed to operate in wind speeds up to 25 m/s (45 mph) and can withstand sustained wind speeds of over 42.5 m/s (95 mph).

The 1.5 MW and 3.0 MW turbines have active yaw and pitch regulation and asynchronous generators. The turbines use a bedplate drive train design where all nacelle components are joined on common structures to improve durability.

The 1.5 MW and 3.0 MW turbines have Supervisory Control and Data Acquisitions (SCADA) communication technology to control and monitor the wind farm. SCADA communications system permits automatic, independent operation and remote supervision, thus allowing the simultaneous control of many wind turbines. Operations, maintenance and service arrangements between the turbine manufacturer and PPM will be structured so as to provide for timely and efficient operations. The computerized data network will provide detailed operating and performance information for each wind turbine. PPM will maintain a computer program and database for tracking each wind turbine's operational history.

Other specifications of the turbines include:

1. Rotor blade pitch regulation.
2. Gearbox with three-step planetary spur gear system (1.5 MW) and a 2-stage planetary gear and a 1-stage helical gear (3.0 MW).
3. Double fed three-phase asynchronous generator (1.5 MW) and an asynchronous 4-pole generator with a wound rotor.
4. A braking system for each blade (three self contained systems) and a hydraulic parking brake (disc brake).
5. Yaw systems are electromechanically driven.

6.2.2 Rotor

The rotor consists of three blades mounted to a rotor hub. The hub is attached to the nacelle, which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems. The preliminary 1.5 MW turbine design identifies a 70.5 m (231 feet) to an 82 m (269 feet) RD, whereas the 3.0 MW turbine will have a RD of 90 m (295 ft). For the 1.5 MW turbine, the swept area for the 70.5 m RD would be 3,904 m² (42,022 ft²), and the 82 m RD would be 5,281 m² (56,844 ft²). The swept area for the 90 m RD would be 6,362 m² (68,480 ft²). The rotor speed would be 10.1 to 20.4 rpm for the 1.5 MW turbines and 9.9 to 18.4 rpm for the 3.0 MW turbines.

6.2.3 Tower

The towers are conical tubular steel with a hub height of 80 to 105 meters (262 to 345 feet). The turbine towers, on which the nacelle is mounted, consist of three to four sections manufactured from certified steel plates. All welds are made in automatically controlled power welding machines and ultrasonically inspected during manufacturing per American National Standards Institute (ANSI) specifications. All surfaces are sandblasted and multi-layer coated for protection against corrosion. Access to the turbine is through a lockable steel door at the base of the tower.

6.2.4 Lightning Protection

Each entire turbine is equipped with a lightning protection system. The turbine is grounded and shielded to protect against lightning. The grounding system will be installed during foundation work, and must be designed for local soil conditions. The resistance to neutral earth must be in accordance with local utility or code requirements. Lightning receptors are placed in each rotor blade and in the tower. The electrical components are also protected.

6.3 DESCRIPTION OF ELECTRICAL SYSTEM

At the base of each turbine a step-up transformer will be installed to raise the voltage to power collection line voltage of 34.5 kV. Power will be run through an underground collection system to the Project feeder system that will feed power to the Project Substation and eventually the point of interconnection. The electrical lines will be buried in trenches adjacent to the Project access roads. At the point where the access and public roads meet, the collection system will either rise from underground to the feeder system or continue as underground lines. The feeder system will deliver the power from the wind farm to the new Project Substation. A new 230 kV transmission line will exit the Project Substation and will transmit power to Otter Tail's and Central Power's Rugby Substation, where it will interconnect into the transmission grid.

An interconnection study for the Project is underway with MISO. The electrical system design and interconnection details will be determined as a result of studies and discussions with MISO. The existing Rugby Substation will require upgrades. A fourth 230 kV circuit breaker will be added to the existing three-breaker ring bus.

All utility protection and metering equipment will meet PPM, and National Electric Safety Code (NESC) standards for parallel operations. The construction manager will ensure that proper interconnection protection is established. Detailed interconnection information will be supplied to the Commission in PPM's application for a Corridor Certificate and Route Permit.

6.4 RUGBY WIND FARM CONSTRUCTION

Several activities must be completed prior to the proposed commercial production date. The majority of the activity relates to equipment ordering lead-time, as well as design and construction of the facility. Below is a preliminary schedule of activities necessary to develop the Project. Pre-construction, construction, and post-construction activities for the Project include:

- ♦ ordering of all necessary components including towers, nacelles, blades, foundations, and transformers;
- ♦ final turbine micrositing;
- ♦ complete survey to establish locations of structures and roadways;
- ♦ soil borings, testing and analysis for proper foundation design and materials;
- ♦ complete construction of access roads, to be used for construction and maintenance;
- ♦ construction of overhead or underground feeder lines;
- ♦ design and construction of the Project Substation;
- ♦ installation of tower foundations;
- ♦ installation of underground cables;
- ♦ tower placement and wind turbine setting;
- ♦ acceptance testing of facility; and
- ♦ commencement of commercial production date.

Access roads will be built adjacent to the towers, allowing access both during and after construction. The permanent roads will be approximately 4.9 meters (16 feet) wide and have Class 5 gravel as cover, adequate to support the size and weight of maintenance vehicles. These roads will meet State and Local requirements. The specific turbine placement will determine the amount of roadway that will be constructed for the Project.

During the construction phase, several types of light, medium and heavy-duty construction vehicles will travel to and from the site, as well as private vehicles used by the construction personnel. PPM estimates that there will be 25 trips per day in the area during peak construction periods. That volume will occur during the peak time when the majority of the foundation and tower assembly is taking place. At the completion of each construction phase this equipment will be removed from the site or reduced in number.

6.4.1 Construction Management

An EPC contractor will be primarily responsible for the construction management of the Project. The EPC contractor will use the services of local contractors, where possible, to assist in Project construction. The EPC contractor, in coordination with local contractors, will undertake the following activities:

- ♦ Securing building, electrical, grading, road, and utility permits
- ♦ Perform detailed civil, structural and electrical engineering
- ♦ Schedule execution of construction activities
- ♦ Complete surveying and geotechnical investigations
- ♦ Forecast Project labor requirements and budgeting

The EPC contractor also serves as key contact and interface for subcontractor coordination. The EPC contractor will oversee the installation of communication and power collection lines as well as the substation. The EPC contractor will also oversee the installation of roads, concrete foundations, towers, machines, and blades, as well as the coordination of materials receiving, inventory, and distribution.

The Project will be constructed under the direct supervision of on-site construction manager with the assistance of local contractors. The construction consists of the following tasks:

- ♦ Site development, including roads
- ♦ Foundation excavation
- ♦ Concrete foundations
- ♦ All electrical and communications installation
- ♦ Tower assembly and machine erection
- ♦ System testing

The construction team will be on site to handle materials purchasing, construction, and quality control.

The EPC contractor will manage local subcontractors to complete all aspects of construction.

Throughout the construction phase, ongoing coordination occurs between the Project development and the construction teams. The on-site manager helps to coordinate all aspects of the Project, including ongoing communication with local officials, citizens groups and landowners. Even before the Project becomes fully operational, the O&M staff is integrated into the construction phase of the Project. The construction manager and the O&M staff manager work together continuously to ensure a smooth transition from construction through wind farm commissioning and, finally, operations.

6.4.2 Foundation Design

The wind turbines' freestanding 80 to 105 meter (262 foot) tubular towers will be connected by anchor bolts to an underground concrete foundation. Geotechnical surveys, turbine tower load specifications and cost considerations will dictate final design parameters of the foundations. Foundations for similar sized turbines are approximately 40 to 60 feet across and seven to 10 feet thick.

6.4.3 Civil Works

Completion of the Project will require various types of civil works and physical improvements to the land. These civil works may include the following:

- ◆ Improvement of existing access roads to the Project site
- ◆ Construction of roads adjacent to the wind turbine strings to allow construction and continued servicing of the wind turbines
- ◆ Clearing and grading for wind turbine tower foundation installations
- ◆ Trenching for underground cabling for connecting the individual wind turbines
- ◆ Installation of an on-site feeder system for connecting wind turbine strings for delivery to the electricity collection/metering location
- ◆ Clearing and grading for pad-mount transformers and other installations
- ◆ Clearing and grading for Project Substation and O&M building
- ◆ Installation of any site fencing and security

Any improvements to existing access roads will consist of re-grading and filling of the gravel surface to allow access even in inclement weather. No asphalt or other paving is anticipated. Access roads will be constructed along turbine strings or arrays. These roads will be sited in consultation with local landowners and completed in accordance with local building requirements. They will be located to facilitate both construction (cranes) and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. All roads will include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The roads will be approximately 4.9 meters (16 feet) wide and will be covered with road base designed to allow passage under inclement weather conditions. The roads will consist of graded dirt and covered with Class 5 gravel. Once construction is completed, the roads will be regraded, filled, and dressed as needed.

6.4.4 Commissioning

The Project will be commissioned after completion of the construction phase. The Project will undergo detailed inspection and testing procedures. Inspection and testing occurs for each component of the wind turbines, as well as the communication system, meteorological system, high voltage collection and feeder system, and the SCADA system.

6.5 PROJECT OPERATION AND MAINTENANCE

Each wind turbine in the Project will communicate directly with the SCADA system for the purposes of performance monitoring, energy reporting and trouble-shooting. Under normal conditions each wind turbine operates autonomously, making its own control decisions.

PPM will enter into contractual agreements with the most appropriate supplier to provide on-site service and maintenance for the Project.

6.5.1 Project Control, Management, and Service

PPM and the appropriate supplier will control, monitor, operate, and maintain the Project by means of a SCADA computer software program. In addition to regularly scheduled on-site visits, the wind farm may be monitored via computer.

The SCADA system offers access to wind turbine generation or production data, availability, meteorological, and communications data, as well as alarms and communication error information. Performance data and parameters for each machine (generator speed, wind speed, power output, etc.) can also be viewed, and machine status can be changed. There is also a “snapshot” facility that collects frames of operating data to aid in diagnostics and troubleshooting of problems.

The primary functions of the SCADA system are to:

- ♦ monitor wind farm status,
- ♦ allow for autonomous turbine operation,
- ♦ alert operations personnel to wind farm conditions requiring resolution,
- ♦ provide a user/operator interface for controlling and monitoring wind turbines,
- ♦ collect meteorological performance data from turbines,
- ♦ monitor field communications,
- ♦ provide diagnostic capabilities of wind turbine performance for operators and maintenance personnel,
- ♦ collect wind turbine and wind farm material and labor resource information,
- ♦ provide information archive capabilities,
- ♦ provide inventory control capabilities, and
- ♦ provide information reporting on a regular basis.

6.5.2 Maintenance Schedule

PPM will remotely monitor the Project on a daily basis. This will be accompanied by a visual inspection by a maintenance manager. Several daily checks will be made in the first three months of commercial operation to see that the Project is operating within expected parameters.

Once installed, the Project service and maintenance is carefully planned and divided into the following intervals:

- A) First service inspection
- B) Semi-annual service inspection
- C) Annual service inspection
- D) Two years service inspection
- E) Five years service inspection

A) First Service Inspection. The first service inspection will take place one to three months after the turbines have been commissioned. At this inspection, particular attention is paid to the tightening up of all bolts by 100 percent, a full greasing, and filtering of gear oil.

B) Semi-Annual Service Inspection. Regular service inspections commence six months after the first inspection. The semi-annual inspection consists of lubrication and a safety test of the turbine.

C) Annual Service Inspection. The yearly service inspection consists of a semi-annual inspection plus a full component check. Bolts are checked with a torque wrench. The check covers 10 percent of every bolt assembly. If any bolts are found to be loose, all bolts in that assembly are tightened 100 percent and the event is logged.

D) Two Years Service Inspection. The two years service inspection consists of the annual inspection, plus checking and tightening of terminal connectors.

E) Five Years Service Inspection. The five years inspection consists of the annual inspection, an extensive inspection of the wind braking system, checking and testing of oil and grease, balance check, and tightness of terminal connectors.

6.5.3 General Maintenance Duties

The O&M field duties include performing all scheduled and unscheduled maintenance including periodic operational checks and tests, regular preventive maintenance on all turbines, related plant facilities and equipment, safety systems, controls, instruments, and machinery, including:

- ◆ Maintenance on the wind turbines and on the mechanical, electrical power, and communications system.
- ◆ Performance of all routine inspections.
- ◆ Maintenance of all oil levels and changing oil filters.
- ◆ Maintenance of the control systems, all Project structures, access roads, drainage systems and other facilities necessary for the operation.
- ◆ Maintenance of all O&M field maintenance manuals, service bulletins, revisions, and documentation for the Project.
- ◆ Maintenance of all parts, price lists, and computer software.
- ◆ Maintenance and operation of Project Substation.
- ◆ Provide all labor, services, consumables, and parts required to perform scheduled and unscheduled maintenance on the wind farm, including repairs and replacement of parts and removal of failed parts.
- ◆ Cooperate with avian and other wildlife studies as may be required to include reporting and monitoring.
- ◆ Manage lubricants, solvents, and other hazardous materials as required by Local and/or State regulations.
- ◆ Maintain appropriate levels of spare parts in order to maintain equipment. Order and maintain spare parts inventory.
- ◆ Provide all necessary equipment including industrial cranes for removal and reinstallation of turbines.
- ◆ Hire, train, and supervise a work force necessary to meet the general maintenance requirements.
- ◆ Implement appropriate security methods.

6.5.4 Operations and Maintenance Facility

PPM will enter into a contractual agreement with the O&M supplier for operations and maintenance services. The service and maintenance activities will be performed by qualified technicians who will report to an operations manager. The operations manager will be responsible for all management, administration, service and maintenance activities.

The O&M facility will be located in the middle of the site, in Section 28 of Spring Lake Township, adjacent to the Project Substation. Typically buildings used for this purpose are 5,000 square feet, which house all the necessary equipment to operate and maintain the Project.

6.6 DECOMMISSIONING AND RESTORATION

PPM has a contractual obligation to the landowners to remove the Wind Facilities, including foundations to a depth of four feet, when the wind easement expires. PPM also reserves the right to explore alternatives regarding Project decommissioning at the end of the Project Certificate term. Retrofitting the turbines and power system with upgrades based on new technology may allow the wind farm to produce efficiently and successfully for many more years. Based on estimated costs of decommissioning and the salvage value of decommissioned equipment, the salvage value of the wind farm will exceed the cost of decommissioning.

7.0 ENVIRONMENTAL ANALYSIS

This section provides a description of the environmental conditions that exist within the Project. Consistent with North Dakota Energy Conversion and Transmission Facility Siting Act, the exclusion and avoidance criteria were considered as well as selection and policy criteria in the selection and design of the site. To support this siting process, maps of the site were generated that indicate the presence or absence of many of the criteria highlighted in NDCC 69-06-08. Consistent with PPM's policy that people and conservation of the environment come first in the conduct of their operations, the Project has been designed to limit the environmental impact of the proposed facility. This policy is attached as Appendix A.

7.1 DESCRIPTION OF ENVIRONMENTAL SETTING (INTRODUCTION)

The Project is located in an area that is entirely rural with an agricultural and services-based economy. The economy is driven primarily by crop-based agricultural products. Wheat is the predominant crop in Pierce County. The landscape in the Project site is primarily rolling hills with multiple isolated wetlands and small lakes throughout the site. Elevations in the Project site range from 1,500 to 1,750 feet above sea level.

7.2 DEMOGRAPHICS

7.2.1 Description of Resources

The Project is located within a lightly populated rural area in north-central North Dakota. There is no indication of any new residential construction on the site. Information on demographics and housing for this section was taken from the 2000 U.S. Census.

The site is located in portions of Torgerson Township and North Pierce Unincorporated Township (UT) in Pierce County, North Dakota. The North Pierce UT includes Spring Lake, Juniata, Tofte, Walsh, and East Barton townships. The population of Pierce County is 4,675, the population of Torgerson Township is 73, and the population of North Pierce UT is 609. The per capita income in these townships is lower than the County average. However, a lower percentage of the township populations are below the poverty level than the County population. None of the population of Torgerson Township is below the poverty level, and approximately 10.7 percent of the population of North Pierce UT is below the poverty level. Approximately 12.5 percent of the population of Pierce County is below the poverty level. Table 9 summarizes the population and economic characteristics within the Project site.

According to the 2000 U.S. Census, the largest industries employing residents of Pierce County are Agriculture and Services.

**Table 9
Population and Economic Characteristics**

Location	Population	Per Capita Income	Percentage of Population Below Poverty Level
Pierce County	4,675	\$14,055	12.5%
North Pierce UT	609	\$13,844	10.7%
Torgerson Township	73	\$13,788	0%

7.2.2 Impacts

Short-term impacts to socioeconomic resources will be relatively minor. Under the 1.5 MW turbine development scenario, up to 68 acres of agricultural land will be removed from production due to conversion to turbine sites and associated access roads; the 3.0 MW turbine development scenario would remove up to 51 acres of agricultural land. Landowner compensation will be established by individual lease agreements. In general, agricultural areas surrounding each turbine can still be farmed. In addition, in an environment of uncertain and often declining agricultural prices and yields, the supplemental income provided to farmers from wind energy leases will provide stability to farm incomes and thus will help assure the continued viability of farming in the Project area. Project construction will not cause additional impacts to leading industries within the Project site. There is no indication that any minority or low-income population is concentrated in any one area of the Project, or that the wind turbines will be placed in an area occupied primarily by any minority group.

To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in Pierce County will contribute to the total personal income of the region. Additional personal income will be generated for residents in both Counties and the State by circulation and recirculation of dollars paid out by the applicant as business expenditures and State and Local taxes. Expenditures made for equipment, energy, fuel, operating supplies and other products and services benefit businesses in the counties and the state.

It is likely that general skilled labor is available either in the County or the State to serve the basic infrastructure and site development needs of the Project. Specialized labor will be required for certain components of the wind farm development; it is likely that this labor will be imported from other areas of the State or from other states as the relatively short duration of construction does not warrant special training of Local or Regional labor. Balancing the use of local contractors and imported specialized contractors would likely alleviate any labor relation issues.

No effects on permanent housing are anticipated. During construction, out-of-town laborers will likely use lodging facilities in and around the City of Rugby. Operation and maintenance of the facility will require few laborers; sufficient permanent housing is available within the county to accommodate these laborers.

Long-term beneficial impacts to the County's tax base as a result of the construction and operation of the wind farm will contribute to improving the local economy in this area of North Dakota. The development of wind energy in this region will be important in diversifying and strengthening the economic base of central North Dakota.

Continuing to establish the north-central region of North Dakota as an important producer of alternative energy sources, such as wind, may spur the development of wind-related businesses in the area, in turn contributing to the economic growth in the region.

7.2.3 Mitigative Measures

Socioeconomic impacts associated with the Project will be primarily positive with an influx of wages and expenditures made at local businesses during the Project construction and an increase in the County's tax base from the construction and operation of the wind turbines and associated infrastructure. In addition, the lease payments paid to landowners will offset potential financial losses associated with removing the land from agricultural production.

7.3 LAND USE

7.3.1 Description of Resources

The Project would be located in northern Pierce County, approximately four miles north of the City of Rugby. The Project proposes to install approximately 150 MW of wind power, consisting of wind turbines ranging in size from 100 1.5 MW to 50 3.0 MW turbines within the 72-square mile (46,080 acres) Project site. The current land use within the Project site is rural agricultural land used for crops and grazing cattle. Several locations within the Project site are currently, or were previously, mined for aggregate resources. These gravel pit locations are more fully described in Section 7.12.1 in Geologic and Groundwater Resources. The Project site is not within the Rugby city limits or within an area of military installation. The development of the Rugby Wind Farm will not displace any residences or existing or planned industrial facilities. Wind turbines will be sited a minimum of 750 feet (1.5 MW turbine) to 800 feet (3.0 MW turbine) from occupied residences. Figure 9 identifies school trust lands within the Project site.

Based on a review of aerial photographs, land use database information, database information, and visits to the Project site, it was determined that the majority of the land area at the site is agricultural land use. Table 10 identifies current land use in the Project site based on the USFWS database. Over 85 percent of the Project site is used for agricultural purposes. Forty-seven percent of the site is cropland and hayland. Undisturbed grasslands are lands placed in the Conservation Reserve Program (CRP). Approximately five percent of the site is former cropland that is now enrolled in CRP. Native grasslands form 38 percent of the site and are primarily used for grazing livestock. The native grasslands include remnant native prairie of various quality dependent on grazing pressure and herbicide applications to control weed species. Approximately 10 percent of the site is wetland, lake, open water, or riparian area.

Table 10
Major Habitats and Their Relative Abundance in the Project Site

Habitat	Acreage	Percent of Project Site
Cropland	21,030	46%
Hayland	335	0.7%
Undisturbed Grassland (CRP)	2,433	5%
Native Grassland	17,704	38%
Open Water, Lake, Riparian	1,686	4%
Wetlands	2,759	6%
Undefined (Farmsteads, Roads, etc.)	91	0.2%

7.3.2 Impacts

The development of the wind project will not result in a significant change in land use. The area would retain the rural sense and remote characteristics of the vicinity. Wind turbines would be sited a minimum of 750 feet (1.5 MW turbine) to 800 feet (3.0 MW turbine) from occupied residences. At other wind developments in the upper Midwest, landowners frequently plant crops and/or graze livestock to the edge of the access roads and turbine pads. The access roads are 16 feet wide and low profile, so they are easily crossed while farming. PPM will work closely with the landowners in locating access roads to minimize land use disruptions to the extent possible. Consideration will be taken in locating access roads to minimize impact on current or future row crop agriculture and environmentally sensitive areas. During the construction of the wind power facilities, additional area may be temporarily disturbed for contractor staging areas and underground power lines. These areas will be graded to original contour and if necessary reseeded with appropriate vegetation.

The permanent site layout has not been determined, but a 150 MW facility at the site would result in a conversion of approximately six acres of land for the 1.5 MW turbine and three acres of land for the 3.0 MW turbines and approximately 62 acres (1.5 MW turbine) to 48 acres (3.0 MW turbine) for gravel access roads. The Project facilities will also include an O&M facility, Project Substation, and transmission line. These areas will be permanently converted from agricultural land use into wind facilities. Approximately three acres will be converted for the O&M facility and Project Substation. Impacts from the transmission line will be addressed in a future application. Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas.

At other wind farms, the public has expressed concerns over potential devaluation of property in and adjacent to proposed wind projects. A study published in October 2002, *“Economic Impacts of Wind Power in Kittitas County, Final Report,”* conducted by Dr. Stephen Grover of ECONorthwest of Portland, OR, summarized survey results as:

“Views of wind turbines will not negatively impact property values. Based on a nationwide survey conducted of tax assessors in other areas with wind power projects, we found no evidence supporting the claim that views of wind farms decrease property values.”

7.3.3 Mitigative Measures

PPM is working closely with the landowners, the USFWS, and other agencies in locating wind turbines and access roads to minimize land use disruptions and impacts to environmentally sensitive areas to the extent possible. Operation of the wind farm will not change the land use in the Project site. The proposed land use would not involve any ongoing industrial use of non-renewable resources or emissions into the environment.

7.4 PUBLIC SERVICES

7.4.1 Description of Resources

Local Services

The Project is located in a lightly populated, rural area in north-central North Dakota. There is an established transportation and utility network that provides access and necessary services to the light industry, small cities, homesteads, and farms existing near the Project site. The closest town to the Project site is the City of Rugby and is the Pierce County seat. The City provides sanitary sewer, water, cable television, DSL, telephone, recreational facilities such as a pool, ball fields and parks, school and library services. Additionally, the City’s local services include emergency services, a volunteer fire department, ambulance service, a hospital and four full-time police officers. There are also several local retail service facilities and institutions.

Electrical Service

There are currently two utility corridors running through the Project site. Xcel Energy owns a 230 kV transmission line that runs north and northeast through the Project site. Central Power owns a 115 kV transmission line that runs north through the western portion of the Project site.

Roads

County and township (section line) roads characterize the existing roadway infrastructure in and around the Project site. There are two State Highways within and adjacent to the Project site. Highway 17 runs through the middle of the Project site west to east. Highway 3 abuts the western edge of the site and runs north to south.

Traffic

The existing traffic volumes on the area’s county highways are documented in Table 11 and Figure 10. Determining the specific capacity of any highway is a complex process, however, general estimates are used for planning purposes. For purposes of comparison, the functional capacity of a two-lane paved rural highway is approximately 5,000 vehicles per day, or Average Daily Traffic (ADT). In general, the

State Highways in and near the Project site carry higher levels of traffic for rural North Dakota, but represent only a fraction of the capacity of the roadway.

Additional county and township roads run through the Project site, but have no count data available. In general, the North Dakota Department of Transportation (NDDOT) indicated that roads under 100 ADT are rarely counted. As indicated in Table 11, all non-State routes are less than 100 ADT. As per NDDOT, the routes with no counts are likely lower than those with count data.

**Table 11
Existing Daily Traffic Levels**

Roadway Segment	Existing Average Daily Traffic (ADT)
Highway 17 through Project site	210
Highway 3 north of Highway 17	1,025
Highway 3 south of Highway 17	1,425
Rolette Road north of Highway 17	55
33 rd Avenue NE through the Project site	95

Source: 2002 Traffic Volumes from NDDOT, Bismarck

Water Supply

Townships have limited public infrastructure services, which is typical of most townships. Homes typically utilize septic systems and water wells for their household needs.

Telephone, Fiber Optic and Microwave Communications

Microwave telecom systems are present in the southern portion of the Project site. Four beam paths were identified; three of these paths generally run east-west and have a node in the City of Rugby. The fourth runs roughly northwest-southeast, and has a northern terminal node at or adjacent to the Rugby Substation. A summary of the results is identified as Appendix C.1. The microwave interference study and worst case Fresnel Zone calculations from Comsearch are attached as Appendix C.2.

A number of land mobile telecom systems are present, but generally confined to the western and southern portions of the Project site.

7.4.2 Impacts

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

Local Services

No impact is expected to local services.

Electrical Service

The Project will require station service from the local electric provider when the wind project is not generating electricity.

Roads

Constructing the Project will require between 32 miles, for the 1.5 MW turbine option, and 25 miles, for the 3.0 MW turbine option, of gravel access roads. In addition, during operation of the Project, the access roads will be used by operation and maintenance crews while inspecting and servicing the wind turbines. The access roads will be between towers, offset as necessary to allow for adequate crane access. One road will be required for each string. The permanent access roads will be approximately 4.9 meters (16 feet) wide and low profile to allow cross-travel by farm equipment. Temporary roads for crane travel will be 10.7 meters (35 feet) wide.

Traffic

The maximum construction workforce is expected to generate approximately 25 additional vehicle trips per day. Using any combination of State and County highways and other township roads throughout the Project site, the traffic impacts are considered negligible. Since many of the area roadways have minimal ADT currently, the addition of 25 vehicle trips represent a large percentage increase (and likely would be perceptible), but would still be less than seasonal variations such as autumn harvest. The capacity of any route and Level-of-Service to the traveling public would not be impacted.

Truck access to the Project site is served by US Highway 2 into Rugby, which is a four-lane divided highway connecting to I-29 in Grand Forks and US Highway 83 in Minot (another four-lane divided highway to I-94 in Bismarck). From Rugby, Highway 3 to Highway 17 will serve as the primary truck access into the Project site. Specific additional truck routes will be dictated by the location required for delivery. Additional operating permits will be issued by the State, County and/or township for over-sized truck movements.

Water Supply

Construction and operation of the Project will not significantly impact the water supply. The abandonment of any wells is not required for the Project. The Project will not require appropriation of surface water or permanent dewatering; temporary dewatering of groundwater may be required during construction of turbine foundations. It is likely that the Project will require a single domestic-sized well for the O&M facility.

Telephone, Fiber Optic and Microwave Communications

Construction and operation of the Project will not impact the telephone and/or fiber optic service to the Project site. No microwave telecom system impacts are anticipated from the Project since no beam paths are present in the turbine siting area. Land mobile telecom system impacts are not anticipated.

7.4.3 Mitigative Measures

Construction and operation of the wind farm Project will be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during Project construction and operation, extensive mitigation measures are not anticipated.

Local Services

With the addition of substation and transmission capacity, no impact to local services is anticipated, and no mitigation is required.

Electrical Service

PPM will purchase station service from a local electrical utility. MISO will suggest appropriate configurations for the electrical system, and PPM will abide by the recommendations to prevent impacts to the transmission system. PPM has established a setback of 400 feet from existing transmission lines. No additional mitigation is necessary.

Roads

PPM is working closely with the landowners to locate access roads to minimize land-use disruptions to the extent possible. A map depicting the preliminary layout of the turbines and access roads is shown in Figures 4 and 5.

Traffic

No impacts are anticipated; as such no mitigation is necessary.

Water Supply

In the event wells are abandoned, they will be sealed as required by North Dakota law. If temporary dewatering of groundwater is required during construction activities, discharge of dewatering fluid will be conducted under the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Pollution Prevention Plan (SWPPP).

Telephone, Fiber Optic and Microwave Communications

Utilities Underground Location Center will be contacted prior to construction to locate and avoid underground facilities. To the extent Project facilities cross or otherwise affect existing telephone or fiber optic lines or equipment, PPM will enter into agreements with service providers so as to avoid interference with their facilities.

Since no impacts to microwave or land based telecom systems are anticipated, no mitigation should be required.

7.5 HUMAN HEALTH AND SAFETY

7.5.1 Description of Resources

Air Traffic

Rugby Municipal Airport is located two miles northwest of the City of Rugby in Section 25, Township 157 North, Range 73 West. The airport is located three miles south of the southwest corner of the Project boundary. There is one asphalt runway oriented in the northwest-southeast directions. The runway elevation is 1,548 feet. This small airport has approximately 2,800 flights annually that include 64 percent local single-engine airplanes.

Electromagnetic Fields

The term electromagnetic fields (EMF) refers to electric and magnetic fields that are present around any electrical device. 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 (wire). EMF can occur indoors and outdoors. However, there are no discernible health impacts from power lines. Turbines and collector lines will be no closer than 800 feet to occupied residences where EMF will be at background levels.

Hazardous Materials / Hazardous Waste

The site is located in a relatively rural area of North Dakota. Hazardous wastes from large industrial or commercial activities are not likely. Potential hazards may exist in rural areas from old gasoline facilities, landfill sites, and private activities.

A Phase I Environmental Site Assessment (ESA) of the Project site is being conducted to identify any Recognized Environmental Conditions (RECs) that may exist.

Security

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

7.5.2 Impacts

Air Traffic

The installation of wind turbines creates a potential for air traffic collision. However, power collection lines are expected to be similar to distribution lines that are present already (located along the edges of fields and roadways), and the wind turbines and meteorological towers themselves would be visible from a distance. The wind turbines and meteorological towers will have lighting and markings that comply with Federal Aviation Administration (FAA) requirements. In addition, the FAA's review will include evaluation of any potential interference with air traffic.

Electromagnetic Fields

While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. Based on the most current research on electromagnetic fields, and the distance between any turbines or collector lines and houses, the Project will have no impact to public health and safety due to EMF.

Hazardous Materials / Hazardous Waste

The Phase I ESA will be used to minimize risk associated with potential RECs as defined by the American Society for Testing and Materials (ASTM) standard that may pose a threat to human health and safety. Significant findings are not anticipated due to the known historic uses of the property.

Security

Project construction and operation will have minimal impacts to security and safety of the local community.

7.5.3 Mitigative Measures

Air Traffic

PPM is coordinating with FAA on the Project layout and lighting and will seek approval from FAA. Wind turbines and meteorological towers will have lighting and markings according to FAA requirements that minimize any potential for air traffic impacts.

Electromagnetic Fields

PPM, will follow “prudent avoidance” methods to EMF exposure such as encouraging conservation, encouraging distributed generation, continuing to monitor EMF research, encouraging utilities to work with customers on household EMF issues, and providing public education (White Paper 36).

Hazardous Materials / Hazardous Waste

Since no significant findings are anticipated, no mitigation is proposed at this time.

Security

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

- ♦ The towers will be placed 400 feet from road ROW and 750 feet (1.5 MW turbine) to 800 feet (3.0 MW turbine) from occupied homesteads. These distances are considered to be safe based on developer experience and are consistent with the required local setbacks. They also serve to reduce noise.
- ♦ Security measures will be taken during the construction and operation of the Project, including temporary and permanent (safety) fencing, warning signs, and locks on equipment and wind power facilities.

- ♦ Turbines will sit on solid steel enclosed tubular towers in which all electrical equipment will be located, except for the pad-mounted transformer. Access to the tower is only through a solid steel door that will be locked when not in use.
- ♦ Where necessary or requested by landowners, PPM will construct gates or fences such as those around the Project Substation.

7.6 NOISE

7.6.1 Description of Resources

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

For the noise evaluation, PPM used representative sound power levels (L_p) of the GE 1.5 MW and Vestas 3.0 MW wind turbines that were provided by the manufacturers.

7.6.2 Impacts

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

The wind turbines will create sources of additional noise. Since the noise levels provided did not include any time-weighted average sound levels, the sound power levels of 104.5 dBA for the 1.5 MW turbine and 106.7 dBA for the 3.0 MW turbine were converted to sound pressure levels and compared to the Pierce County Standard of 50 dBA at the nearest property line. The turbines were modeled to determine at what distance turbine noise would not exceed the standard. Turbines were modeled using the following equation for a hemispherical point source: $L_p = L_w - 10 \log (2\pi r^2) - A_{atm}$ where L_p is defined as the sound pressure level at the distance of interest (r), L_w is the sound power level provided by the turbine manufacturers and A_{atm} is defined as the attenuation provided by atmospheric absorption. Sound is generated from the wind turbine at points near the hub or nacelle, eighty meters in the air, from the blade rotation, and motors near ground level. Therefore the noise source could be considered both spherical and hemispherical. Use of the sound propagation equation for a hemispherical point source is therefore conservative and predicts the maximum distance for noise exceedences.

The maximum distances calculated where an exceedence of the 50 dBA standard would no longer occur is 190 meters (623 feet) for the 1.5 MW turbine and 240 meters (788 feet) for the 3.0 MW turbine (Figure 11). Turbines will be sited according to the siting plan in Section 4.2.

7.6.3 Mitigative Measures

Impacts to nearby residents and other potentially affected parties in terms of noise will be taken into consideration as part of the actual siting of the turbines. In its application for a Conditional Use Permit for the Project, pursuant to item three of the Pierce County Ordinance, Section 10. Wind Power Generation Facilities and Towers, PPM will ask for authorization to limit the noise generated by the turbines to a maximum level of 50 dBA at the nearest residence versus the nearest property line. PPM has discussed the Pierce County wind ordinance noise setback requirements with the County and the County indicated that this approach to noise compliance would be acceptable to the County.

7.7 VISUAL IMPACTS

7.7.1 Description of Resources

The topography of the Project site is a mixture of open plains with rolling fields broken by large hills and adjacent lakes. Elevations range between 1500 and 1750 feet above sea level. The highest elevations occur at the peaks of steep moraines located in the central portion of the site. The dominant landforms in the site are glacial deposits including a stagnation moraine, sand and gravel outwash deposits, and silty/sandy lacustrine deposits. A topographic map of the Project site is shown in Figure 5.

Within the Project site the dominant land use is pasture. The most widely grown crops in the Project site are wheat, corn, and sunflowers. Wetland areas are dominated by cattails, sedges, rushes, and willows. A mix of deciduous and coniferous trees planted for windbreaks typically surrounds farmsteads. Generally, these forested areas are isolated groves or windrows established by the landowner/farmers to prevent wind erosion and shelter dwellings. Typical tree species include box elder, bur oak, and cottonwood.

The site is located in a topographically isolated portion of the Willow Creek watershed which empties into the Souris River. It is five miles from the edge of the Devil's Lake watershed. Most of the site consists of isolated basins associated with wetlands or lakes. The few small intermittent creeks that exit the site flow to the west-southwest. Figure 12 shows the typical landscape in the site.

7.7.2 Impacts

The placement of turbines will have an effect on the visual quality within the site and vicinity. However, discussion of the aesthetic effect of the proposed wind farm is based on subjective human response. The wind farm would have a combination of effects on the visual quality/rural character of the area. For some viewers, the Project could be perceived as a visual intrusion, characterized as metal structures, 80 to 105 meters (262 to 345 feet) high at hub height for both the 1.5 and 3.0 MW turbines, intruding on the natural aesthetic value of the landscape. Figure 13 shows a photo simulation of what a view of the wind farm would look like from 33rd Street, south of Herd Lake, for both the 1.5 and 3.0 MW turbines. The visual difference between the 1.5 MW and 3.0 MW turbines will be in the RD. The 1.5 MW turbine design will have a maximum of an 82 m (269 feet) RD, whereas the 3.0 MW turbine will have a RD of 90 m (295 feet). The difference in visual impacts between the 1.5 and 3.0 MW turbines RD will be difficult to ascertain. The major difference will be in the number of turbines associated with the wind farm. The

PPM does not anticipate adverse impacts to previously identified archaeological resources as a result of the Project. PPM will make every effort to avoid these archaeological resources and any resources identified during the Class III field inventory.

7.8.3 Mitigative Measures

PPM will make every effort to avoid impacts to identified archaeological resources. In the event that an impact would occur, PPM would determine the nature of the impact and consult with the SHPO on whether or not the resource was eligible for listing in the National Register of Historic Places (NRHP). Mitigation for project-related impacts on NRHP-eligible archaeological resources may include an effort to minimize Project impacts on the resource and/or additional documentation through data recovery.

If the Class III cultural resources inventories should determine that such a plan is appropriate, PPM would also develop a discovery plan to be in place should previously unknown archaeological resources or human remains be inadvertently encountered during the Project. The plan would outline the framework for handling such discoveries in an efficient and legally compliant manner. The discovery plan may include the following topics: construction contractor training, identification of resources in the field, contact information for PPM-designated professionals to address a discovery, procedures for avoidance, and associated tasks in the event of work stoppage in a construction area. With regard to a discovery of human remains, procedures would be followed to ensure that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.

7.9 RECREATIONAL RESOURCES

7.9.1 Description of Resources

Recreational opportunities in Pierce County include camping, hiking, biking, swimming, hunting, fishing, and nature observation. Review of state and federal databases indicates that no registered national wildlife refuges, state wildlife management areas, state game refuges, game management areas, nature preserves, county parks, or formal recreational areas are present within or near the Project site. No lakes with public boat access are located on or within four miles of the Project site. There are, however, areas of state and federal land, designated federal WPAs. In addition, there are private properties over which the USFWS has an easement for protection of wetland and grassland resources. The wetland easements stipulate that the landowner can not drain, fill, or burn the wetlands within the easement. The grassland easements stipulate that a landowner can not disturb the sod or burn the native grasslands within the easement. The WPAs and easement areas are depicted in Figure 9.

The purpose of WPAs, wetland easements, and grassland easements is to protect wetland areas and grassland buffers for the reproduction and growth of waterfowl species. USFWS WPAs and wetland and grassland easements in the Project site are managed through the J. Clark Salyer National Wildlife Refuge and Wetland Management District (WMD). While the Project site is not in or part of the wildlife refuge, the WMD covers all of Pierce County, including the Project site.

7.9.2 Impacts

In general, recreational impacts will be visual in nature and limited to individuals using public or private property in the Project site for hiking, hunting, fishing, or nature observation. See Section 7.7 for detailed discussion of anticipated visual impacts and proposed mitigative measures. Depending on the turbine layout, supporting infrastructure (e.g., roadways, feeder lines, substations, etc.) may have limited impact to USFWS grassland and wetland easements, and public lands. These impacts will be evaluated with the USFWS and public agencies to determine methods to minimize or mitigate impacts and required permitting. WPAs will be avoided. No other significant impacts to recreational resources are anticipated.

7.9.3 Mitigative Measures

As noted, wind turbines and supporting infrastructure will not be located within WPAs. PPM recommends that wind turbines will not be located within 0.25 miles of WPAs. The USFWS is supportive of PPM's proposed buffer around WPAs. Turbines may be located within public land if appropriate land use agreements can be reached with the local, state, or federal agency landowner. Turbines may be located in USFWS easement areas as long as impacts to wetland areas are avoided or mitigated. Locating turbines in these easements will require USFWS coordination, compatibility analysis, and permits. To the extent practicable, supporting infrastructure will be placed in a manner to avoid impacts to public land and USFWS easements. Where it is not possible to avoid impacts to these lands, alternative construction methods, such as directional boring, will be considered to minimize impacts.

Since it is not anticipated that any significant recreational resources will be removed from service by implementation of the Project, no adjacent land will be converted or dedicated to recreational use or wildlife management. No other mitigation is anticipated to be necessary.

7.10 EFFECTS ON LAND-BASED ECONOMIES

7.10.1 Description of Resources

Agriculture/Farming

The majority of the site is cultivated farmland, pasture, and grasslands as shown in the USFWS Land Use Map, Figure 14. Cultivated land comprises approximately 21,365 acres of the Project site. There are also numerous small areas of cultivated land that are currently enrolled in the CRP. These areas account for approximately 2,433 acres of the Project site. Native grasslands comprise 17,704 acres of the land. Approximately 85 percent of the land in the Project site is utilized for agricultural purposes.

According to the 2002 Census of Agriculture, Pierce County is ranked 38th overall in agricultural products sold in North Dakota. Within the Project site, wheat is the most widely grown crop. Hay, sunflowers, and corn are additional crops in the Project site. Pierce County has approximately 487 farms, of which the primary commodity is crops, primarily wheat for grain. Cattle are the primary livestock in the County. According to the 2002 Census of Agriculture, the amount of land in farms decreased six percent in Pierce

County. The market value of agricultural products from Pierce County in 2002 was approximately \$36,295,000. Crop sales account for approximately 70 percent of the total value.

Crops are a large percentage of the value and the land type, such as prime farmland, is important in production. Prime farmland is the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. The National Resource Conservation Service (NRCS) has two classifications for prime farmland. The first is where all areas of the soil series are classified prime farmland. The second is where only the drained areas of the soil series are prime farmland. The NRCS also identifies farmland of statewide and local importance, which is land that is important for the production of food, feed, fiber, forage and oilseed crops. Generally, additional farmlands of statewide or local importance include those that are nearly prime and that produce high yields of crops in an economic manner when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmland soils if conditions are favorable. Table 13 lists the soils considered Prime Farmland and soils of statewide or local importance within the Project site. Figure 15 shows the prime farmland soil distribution in the Project site.

There are 26 family homes within the Project site. These homes are identified on Figures 4 and 5.

According to the North Dakota State Water Commission Water Permit Retrieval System, there is one property with an irrigation permit within the Project Site (Figures 3 and 17).

Woodlands

Economically important forestry resources are not found in the Project site. Woodlands are primarily associated with homes in the form of woodlots and windbreaks within the Project site. Woodlands within the Project site are depicted on Figure 3 and 14.

**Table 13
Prime Farmlands Pierce County**

Map Symbol	Soil Unit	All Areas Are Prime Farmland	Soil of Statewide/Local Importance	Prime Farmland Only When Drained
1	Tonka Silt Loam			X
34	Tiffany Fine Sandy Loam			X
35	Embden Fine Sandy Loam, 0-3% Slopes	X		
36B	Embden-Egeland Fine Sandy Loams, 3-6% Slopes	X		
39	Swenoda Fine Sandy Loam, 0-3% Slopes	X		
43	Wyndmere Fine Sandy Loam			X
44	Fossum Soils		Local	
60	Emrick Loam, 0-3% Slopes	X		
62	Emrick-Heimdal Loams, 0-3% Slopes	X		

Map Symbol	Soil Unit	All Areas Are Prime Farmland	Soil of Statewide/Local Importance	Prime Farmland Only When Drained
65	Fram Loam, 0-3% Slopes	X		
66	Gardena Silt Loam, 0-3% Slopes	X		
70	Glyndon Silt Loam, 0-3% Slopes	X		
74	Borup Silt Loam			X
80	Cathay Loam, 0-3% Slopes		Statewide	
81	Cathay-Gardena Silt Loams, 0-3% Slopes		Statewide	
82	Letcher Fine Sandy Loam, 0-3% Slopes		Local	
88B	Arvilla Soils, 0-6% Slopes		Local	
95	Divide Loam, 0-3% Slopes	X		

7.10.2 Impacts

Agriculture/Farming

No impacts are anticipated to animal health and safety due to the construction or operation of the wind farm and associated facilities. Except for the physical locations of the turbines and access roads, all the land surrounding the facility will be available for grazing.

Actual impacts to agriculture production will be determined once turbine and road locations are finalized. Each turbine will impact approximately 0.06 acres of land. A total of between six acres (1.5 MW turbine option) and three acres (3.0 MW turbine option) of land will be impacted due to turbine placement. Roads will be 16 feet wide and will vary in length. Currently, road impacts are estimated at between 62 acres (1.5 MW turbine option) and 48 acres (3.0 MW turbine option). Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas. It is possible that some of this land is not used for agricultural purposes, thus the actual impacts to agriculture production cannot be determined until turbine and road locations are finalized.

Most of the soil considered prime farmland within the Project site is located in the southern and eastern portions of the site (Figure 15). Approximately 45 percent of the site is prime farmland soils. The final layout will site only a limited number of turbines and facilities in prime farmlands. The preliminary layout includes 16 turbines and associated access roads in prime farmland. Even if all the 1.5 MW turbines and associated facilities were placed within prime farmland areas, only approximately 78 acres of prime farmland would be impacted, or less than 0.3% of prime farmland in the Project site. The 3.0 MW scenario would impact approximately 61 acres or less than 0.2% of prime farmland in the site. Using the scenario with all turbines and facilities located in prime farmland, the maximum 0.2-0.3% impact to the site acreage would be a small percentage of prime lands in the County and would be a negligible impact to agricultural production. When considering the impact on production for the top five crops in Pierce

County, if all the turbines and access roads impacted prime farmland, the total area would affect less than 0.1 percent of the yearly production for those commodities (based on yields reported in 2003). As noted earlier, wind lease payments will provide farmers with a supplemental source of income, helping assure that farmers can continue to operate financially viable farms, and thus helping to assure the continuation of farming in Pierce County.

No turbines will be placed within 750 feet (1.5 MW turbine) to 800 feet (3.0 MW turbine) of family homes. Other impacts to homes are discussed throughout Section 7.0. Family farms will be impacted due to the loss of land associated with the construction of the turbines and access roads. The extent of the impact will not be known until final turbine locations are determined in conjunction with the landowner.

No impacts to irrigation are anticipated.

Woodlands

No impacts are anticipated to woodlands. Since a majority of the woodlands are associated with homesteads and windbreaks, no impacts are anticipated.

7.10.3 Mitigative Measures

Agriculture/Farming

The wind turbines and access roads will be located so that the most productive farmland (prime farmland) will be avoided as much as possible. Only land for the turbine and access roads will be unavailable for crop production. PPM will work with landowners to minimize impacts to their land. Once the wind turbines are constructed, all land surrounding the turbines can still be farmed or grazed.

Woodlands

No impacts are anticipated to woodlands. If unavoidable impacts to woodlands arise, then individual trees will be mitigated at a ratio of 2:1 and will be kept alive for five years.

7.11 SOILS

7.11.1 Description of Resources

The soils in the Project site are largely composed of two soils associations; Swenoda-Towner-Barnes (ND015) and Heimdal-Emrick-Esmond (ND057). A small lobe of Gardena-Overly-Aberdeen (ND010) is found along the western edge of the site. The soil associations are mapped in Figure 16.

Swenoda-Towner-Barnes soils are old glacial outwash and glacial till plains with gently rolling to flat topography. The association makes up 26 percent of the soils in Pierce County. They range from well drained to poorly drained and tend to be sandy. The soil association is used for an even mix of crops and pasture/hay. It has a low available water capacity and a seasonal high water table. Strium soils make up a small component of the association and contain most of the wetland areas. The hazard of soil blowing in this association is high.

Heimdal-Esmond-Emrick soils occur in undulating to steep terrain in old glacial till plains. The association makes up 26 percent of the soils in Pierce County. Esmond soils occur at the higher elevations, followed by Heimdal soils in the intermediate elevations, and Emrick soils in the lower elevations. Most of the gently rolling areas are used for cropland. The rolling steep and stony areas are used for pasture or hay. Wetlands in this area tend to occur in Strium and Tonka soils. Hazards of soil blowing and water erosion are significant in this soil association.

Gardena soils compose a small area in the western portion of the Project site. Gardena soils occur in level to undulating terrain in old glacial lake plains. The association makes up only two percent of the soils in the county. Nearly all of the association is used for cropland and is among the most productive in the County.

7.11.2 Impacts

The impact to soils in the site will be limited to areas removed from agricultural production and road construction. Both of these impacts will be relatively minor. Turbine foundations are comparatively small, and access roads will be single lane gravel roadways. In isolated cases, grading may be required for roadway construction. Exact impact acreages will not be known until turbine siting is finalized, but for the 1.5 MW turbine option, expected impacts will be approximately 0.68 acres per turbine for access roads and turbine foundations. The total impact for 100 1.5 MW turbines is therefore expected to be 68 acres. For the 3.0 MW turbine option, expected impacts will be approximately 1.02 acres per turbine for access roads and turbine foundations; this yields a total impact for 50 3.0 MW turbines of 51 acres. Approximately eight acres of land will be temporarily impacted for contractor staging and lay down areas. Since land immediately adjacent to the turbines and access roads can be used for pasture or row crops, the Project will only impact those lands used directly for turbine foundation or roadway construction. A discussion of impacts to prime farmland soils is in Section 7.10.

The potential for wind and water erosion exists in the soil types found on the site. Construction practices will minimize soil erosion during and after turbine construction, and impacts are not expected to be measurable.

7.11.3 Mitigative Measures

Wind and water erosion are potential hazards for the soils found on the site. To minimize erosion during and after construction, BMPs for erosion and sediment control (SN 19389 9/99) will be utilized. Since turbines will not be located on significant slopes, only non-structural practices should be required. These practices include: Temporary Seeding, Permanent Seeding, Mulching, Filter Strips, Erosion Blankets, Grassed Waterways, and Sod Stabilization. Top soil will be segregated if cuts are made during construction and reapplied after final contours have been graded.

7.12 GEOLOGIC AND GROUNDWATER RESOURCES

7.12.1 Description of Resources

Pierce County is covered by glacial drift deposits of Pleistocene age. The surficial deposits are generally referred to as the Coleharbor Formation. In most areas of Pierce County the Coleharbor Formation is comprised of drift material from different periods of glacial advances including pre- and Early Wisconsinan, and late Wisconsinan. The surficial geology in the vicinity of the Project site includes stagnation moraine (till), sand and gravel outwash deposits, and silty/sandy lacustrine deposits. Isolated sand and gravel deposits associated with kames and eskers are also present within the Project site. Glacial material is approximately 100 feet thick in the Project site, and the area is characterized by rolling topography.

The uppermost bedrock unit in the Project site generally is the Cretaceous Fox Hills Formation, although remnants of the Cretaceous Hell Creek Formation may overlie the Fox Hills formation depending on location and bedrock topography. Localized areas of bedrock highs can be found in the Project site. No areas of geologic instability (e.g., fault zones, karst topography) were identified.

Geologic-related mineral resources in the Project site include minor sand and gravel deposits, generally associated with glacial kames and eskers. Field review of the Project site identified several gravel pits; the location of these pits is presented in Table 14.

Groundwater resources in the vicinity of the Project site are generally derived from buried glacial outwash deposits of sand and gravel or the Fox Hills Formation. Review of the North Dakota State Water Commission database indicates that wells in and around the Project site are either screened in the unconsolidated glacial drift aquifer or the Fox Hills aquifer. Depths of these wells range from approximately 60 to 150 feet. The State Water Commission database only identified one domestic well, one stock well, and one observation well within the Project site limits in addition to several wells outside of the project site limits. Given the number of residences in the Project site, it appears that the majority of the existing wells at the site are not recorded in the State Water Commission database. This indicates that more domestic wells are in the site than have been documented; it is assumed that each residence has at least one water supply well. Domestic groundwater supply appears to be fairly accessible in the Project site and is dependent on the relative occurrences of sand and gravel aquifers at any given area.

Groundwater likely occurs at shallow depths locally, as evidenced by the presence of multiple isolated wetlands in the Project site. Groundwater flow direction of the water table aquifer varies greatly and is controlled primarily by topography.

**Table 14
Identified Gravel Pit Locations**

Township	Range	Section	Quarter
158N	72W	23	NE
158N	72W	24	SE
158N	71W	20	NE
158N	71W	30	NE & SE
158N	71W	29	NE
158N	72W	31	SW
158N	72W	33	SW & SE
158N	72W	36	SE
158N	71W	31	SW & NE
158N	72W	4	NW
158N	72W	7	SW & SE

7.12.2 Impacts

Impacts to groundwater resources are not anticipated as water supply needs will be quite limited. It is probable that operations and maintenance water requirements will be satisfied with a single domestic-sized water well. Depending on the location of wind turbines and supporting infrastructure, it is possible that sand and gravel resources could be made unavailable for development.

7.12.3 Mitigative Measures

Wind turbine locations will not impact the use of existing water wells because the turbines will not be sited within 750 feet (1.5 MW turbines) and 800 feet (3.0 MW turbines) of occupied structures. Wind turbines will be sited so as to avoid sand and gravel resources identified in the Project site. Where sand and gravel resources cannot be avoided, PPM will coordinate with landowners regarding impacts and any necessary mitigation. No other mitigation is anticipated to be necessary.

7.13 SURFACE WATER AND FLOODPLAIN RESOURCES

7.13.1 Description of Resources

Surface water and floodplain resources for the site were identified by reviewing U.S. Geological Survey topographic maps, Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA), and USFWS National Wetlands Inventory (NWI) data. The major surface waters located within the site include wetlands (discussed in detail in Section 7.14), and several intermittent streams. These water resources are shown in Figure 17.

The site lies within the Willow Creek subbasin of the Souris basin, near the boundary between the Souris basin and the Devils Lake-Sheyenne basin. Intermittent streams drain primarily to the west and north. The rugged topography of the site includes a number of isolated palustrine and lacustrine wetlands; many of these wetlands have no inlet or outlet and thus are not subject to the jurisdiction of the US Army Corps of Engineers (USACE) wetland regulations under the Clean Water Act. Seasonal variations in precipitation and groundwater recharge are the primary drivers of wetland and lake elevations. Field observations and review of recent historical aerial photography indicate that wetland and lake elevations at the site have been rising over the past several years.

Review of FEMA floodplain maps indicates that the site and its surroundings are not within the 100-year or 500-year floodplain.

7.13.2 Impacts

Construction of the wind turbines, transformer pads, and access roads will disturb land within the Project site. The wind turbines will be built on uplands; this will avoid intermittent streams and wetlands located in the lower positions in the landscape. Access roads to the turbines will be built to avoid impacts to surface waters.

The Project will not impact floodplain areas.

7.13.3 Mitigative Measures

A wetland delineation using USACE standard methods will be completed prior to construction. The Project is not anticipated to impact jurisdictional waters of the United States; therefore permits through the USACE are not anticipated. Since jurisdictional waters as defined by the USACE are not anticipated to be impacted, a Section 401 Water Quality certification is not required from the State of North Dakota. However, any wind turbines or supporting infrastructure within USFWS wetland or grassland easements will require a USFWS permit (see Section 10.11.2 for additional information).

Access roads constructed adjacent to wetlands or intermittent streams and drainageways will be designed in a manner so runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. An NPDES permit application will be prepared by PPM Energy and submitted to the North Dakota Department of Health prior to the construction of the wind turbines and access roads.

7.14 WETLANDS

7.14.1 Description of Resources

Wetlands near the Project site were identified by reviewing NWI Maps. The site was field inspected in November 2004 and April 2005, but no formal wetland delineations were completed. Wetlands on the site represent typical glacial prairie pothole wetlands. Wetlands range in size from isolated basins less than a few hundred square feet in size to large lakes covering 200 acres. The vast majority of wetlands on the site are emergent, but wetland acreage is split between lacustrine and emergent wetlands (see Table 15). No riverine or floodplains wetlands were found on the site.

Some wetlands in farmed areas may have been drained for agriculture, but this practice appears rare in this area. Flooded farm buildings and roadways on the site indicate a rising water table on the site. This suggests that effective wetland conversion to farmland on the site would be difficult. The isolated topography of most of the wetlands on the site also makes wetland drainage complicated. The NWI wetland types and their acreage are presented in Table 15. The wetlands within the site are palustrine and lacustrine systems. See the NWI Map in Figure 17 for locations of wetlands.

Table 15
NWI Wetland Types and Acreages

Wetland Acreages (by type)		
Cowardin Classification	Count	Acres ¹
Palustrine Emergent Temporarily Flooded (PEMA)	991	926
Palustrine Emergent Seasonally to Semipermanently Flooded (PEMC, PEMF)	851	1479
Palustrine Aquatic Bed Semipermanently Flooded (PABF)	114	491
Palustrine Forested Broad-Leaved Deciduous Temporarily to Seasonally Flooded (PFO1A, PFO1C)	2	1
Lacustrine Littoral Aquatic Bed Semipermanently Flooded to Intermittently Exposed (L2ABF, L2ABG)	27	1526

¹ Wetland acreage is calculated using USFWS NWI data.

7.14.2 Impacts

Wind turbines will be built on upland areas, and thus avoiding wetlands on the lower areas of the landscape. Access roads and supporting facility features will be designed to minimize impacts on wetlands. USFWS WPAs will be avoided in all cases and will not be impacted. PPM proposes a 500 foot buffer around large wetland complexes at the site to minimize any potential impacts to important wildlife habitat. A wetland delineation using USACE standard methods will be completed prior to construction.

7.14.3 Mitigative Measures

Wetlands will be avoided to the extent practicable during the construction phase of the Project. If impacts to USACE jurisdictional wetland are proposed, then a Section 404 and 401 permit application will be submitted to the USACE and State of North Dakota, respectively. Permanent impacts to jurisdictional wetlands and waters will be mitigated according to USACE requirements. However, within the site area the USACE has identified that the wetlands are isolated basins and not under USACE jurisdiction.

Because jurisdictional waters, as defined by the USACE, are not anticipated to be impacted, a Section 401 Water Quality certification is not required from the State of North Dakota.

Wetlands within USFWS easements on private property are under USFWS jurisdiction. If wetland impacts in USFWS easements cannot be avoided, PPM will work with the USFWS to obtain permits for the impact and create required mitigation. The USFWS requires a compatibility assessment for any wetland impacts on easement land (see Section 10.11.2).

PPM will use BMPs during construction and operation of the Project to protect topsoil and adjacent wetland resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material, and revegetating disturbed areas with native species.

7.15 VEGETATION

7.15.1 Description of Resources

The Project is located in the Northern Glaciated Plains Ecoregion. The native vegetation is transitional between tall and shortgrass prairie. The potential natural vegetation in the tallgrass/midgrass prairie includes western wheatgrass, green needlegrass, big and little bluestem, blue grama grass, and forbs such as purple cornflower, lead plant, and pasque flower. There are numerous temporary and seasonal wetlands with vegetation that includes cattails, cordgrass, rushes, and sedges. Native tree cover in the Project site primarily would have been limited to lake margins and would have been dominated by aspen and bur oaks.

As a result of settlement in the 1800s, the area was converted into farmland and rangeland. Settlement and farming activities were dependent on slope, presence of rocks in soil, and wetlands. During this process, the wetland areas were frequently ditched and drained. Trees were planted by landowners for wind blocks (windrows and homestead groves) or were established by natural means, such as being transported to the area by animals, birds or wind.

Based on a review of aerial photographs, land use database information, USFWS database information, and a visit to the Project site, it was determined that the majority of the land area at the site is agricultural land use. Table 10 identifies current land use in the Project site based on the USFWS database. Forty-seven percent of the land use at this agricultural site is cropland and hayland. Undisturbed grasslands are lands placed in CRP and they can not be disturbed for the sign-up period of 10 years. Approximately five percent of the site is formerly cropland that is now enrolled in CRP. Native grasslands are 38 percent of the site and are primarily used for grazing livestock. The native grasslands include remnant native prairie of wide-ranging quality dependent on grazing pressure and herbicide applications to control weed species. Approximately 10 percent of the site is wetland, lake, open water, or riparian area.

The principal crop in Pierce County is wheat. Other crops include corn, oats, barley, flax, sunflower, canola, alfalfa, and hay. Grasslands are used for range and pasture of cattle. Heavily grazed range

contains Kentucky bluegrass, quack grass, and brome grasses. Lightly grazed or undisturbed range contains native prairie species. CRP land is typically covered by brome grasses, orchard grass, and alfalfa. CRP may also be planted in native grasses such as big bluestem, little bluestem, and Indian grass. Land is typically put into CRP for 10-year cycles. Additional information on agriculture and farming can be found in Section 7.10.

The USFWS North Dakota Land Cover Classification indicates 100 acres of forested or woody vegetation in the Project site. Generally, these woodland areas are adjacent to lake margins, isolated groves, or windrows established by the landowner to prevent wind erosion and shelter dwellings. Typical tree species include bur oak, cottonwood, aspen, green ash, box elder, American elm, and silver maple.

There are no state or federal grasslands within the Project site. The USFWS does have WPAs in the Project site that include wetlands and grasslands. In addition to the WPAs, the USFWS also has grassland easements and wetland easements throughout the Project site on private lands. These lands are identified in Figure 9.

7.15.2 Impacts

The amount of vegetation that will be removed as a result of the Project will be determined once a permanent site layout is determined. As requested by the USFWS, impacts to grassland easement areas will be limited to one turbine per quarter-section. It is anticipated that six acres of the Project site will be used for 1.5 MW turbines and three acres for 3.0 MW turbines. Approximately 62 acres will be used for access roads for the 1.5 MW turbines and 48 acres for the 3.0 MW turbines. The footprints of the O&M building and substation will require approximately three acres of land. Approximately 10 acres of land will be purchased for these facilities. The vegetation will be permanently removed and replaced by wind turbines, access roads, transformers, O&M facility, substation, and transmission. During the construction of the wind power facilities, additional area may be temporarily disturbed for contractor staging areas and underground power lines. Approximately eight acres of land will be temporarily impacted for contractor staging and lay down areas. Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations to blend in with existing vegetation. No impacts are anticipated to woodlands, shrubs or wetland areas.

7.15.3 Mitigative Measures

PPM will work closely with the USFWS during micro-siting to minimize impacts to vegetation within the Project site. PPM will conduct a pre-construction inventory of existing wetlands, native prairie, and woodlands. The preconstruction inventories will have varying levels of detail with the most specific detail in the vicinity of construction. These preconstruction inventory reports will be filed with the PSC prior to construction. PPM will avoid impacts to USFWS WPAs and work with the USFWS to avoid or minimize impacts to wetlands and native grasslands within USFWS easements. PPM will work to avoid and to minimize impacts to existing trees and shrubs. If impacts to individual trees and shrubs cannot be avoided, these resources will be mitigated at a ratio of 2:1 and will be kept alive for five years.

If impacts are proposed within USFWS wetland or grassland easements, then the USFWS will perform a compatibility analysis and, if acceptable, then issue a Special Use (temporary impact) or ROW Permit (permanent impact). PPM would follow permit conditions for site restoration and replacement.

If jurisdictional wetland impacts are proposed, then a Section 404 and 401 permit application will be submitted to the USACE and State of North Dakota, respectively. Permanent impacts to jurisdictional wetlands and waters will be mitigated according to USACE requirements.

PPM will use BMPs during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material, and revegetating rangelands with native species.

7.16 WILDLIFE

7.16.1 Description of Resources

Information on the existing wildlife in the wind farm site was obtained from a variety of sources including observations during field visits and information from the North Dakota Game and Fish Department (GFD), North Dakota Parks and Recreation Department (NDPRD), and USFWS. PPM hired Western EcoSystems Technology, Inc (WEST) to conduct evaluation of biological and avian resources. WEST used the voluntary USFWS Interim Guidelines to calculate a Potential Impact Index (PII) score and complete a Phase One screening of avian resource for the Project site (Appendix C.3).

Wildlife in the Project site consists of birds, mammals, fish, reptiles, amphibians, and insects, both resident and migratory, which utilize the Project site habitat for forage, migratory stopover, breeding and/or shelter. Species present in the Project vicinity are associated with agricultural fields, pasture grasslands, and wetland areas. Common mammals in the project vicinity include raccoon, mink, skunk, weasel, white-tailed deer, coyote, red fox, badger, porcupine, and rabbit. During field visits of the site, fox squirrel (*Sciurus niger*), white-tailed deer (*Odocoileus virginianus*), and longtail weasel (*Mustela frenata*) were observed. Avian species observed during field visits include snow geese (*Chen caerulescens*), black-billed magpie (*Pica pica*), blue jay (*Cyanocitta cristata*), ring-necked pheasant (*Phasianus colchicus*), sharp-tailed grouse (*Tympanuchus phasianellus*), hairy woodpecker (*Dendrocopos villosus*), bald eagle (*Haliaeetus leucocephalus*), and common raven (*Corvus corax*).

7.16.2 Impacts

Development of the wind farm, including the construction and operation of the Project, is expected to produce a minimal impact to the wildlife. PPM has conducted, and will conduct, environmental studies of this potential site to aid in detailed placement of turbines, roads, and associated facilities to avoid or minimize impacts to wildlife and habitat. In the course of doing good business, PPM implements many of the policies proposed by the American Bird Conservancy and other organizations for siting wind facilities.

A Phase I screening report was completed for the site and is attached as Appendix C.3. A “PII score,” pursuant to the USFWS Interim Voluntary Windpower Guidelines, was determined for the proposed Project and the reference area chosen was the Audubon National Wildlife Refuge. The PII score for the Rugby site is 177 and the reference area was 216 (a higher score indicates a more sensitive site). WEST identified low potential for raptor fatalities at the site based on the general lack of potential above-ground nesting areas, relatively low potential for concentrated prey items during most periods of the year, and lack of a defined ridge or other topographic feature at the site. It is anticipated that direct impacts to raptors will be in the range of 0.006 to 0.033 raptors/turbine/year. This site is similar land use and topography to Buffalo Ridge area in southwestern Minnesota where there was one documented raptor fatality (red-tailed hawk) during four years of searching 354 turbines. The Project site has similar general habitat and species composition compared to other wind farms and it is anticipated that bird fatality rates documented at other locations would be similar to the proposed Project. Studies outside of California have identified an average of 1.83 fatalities/turbine/year for all birds (0.006 are raptors). Studies at Buffalo Ridge in Minnesota estimated 0.98 fatalities/turbine/year. Potential indirect impacts to breeding birds due to displacement is possible in the immediate vicinity of the turbines.

Potential bat roosting habitat at the site includes trees and old farm buildings. Bats may forage over the entire Project area, although the extent of use is not known. Bat fatalities have been reported for most wind farms where post-construction monitoring data is available. Reported estimates of bat mortality at wind farms through 2001 ranged from 0.07 to 10 bats/turbine/year. Bat fatality rates in the Upper Midwest are estimated at 1.7 bats/turbine/year or 2.7 bats/MW/year (NWCC 2004). Most bat casualties at wind farms have been migratory species that conduct long migrations between summer roosts and winter hibernacula. The proposed site does not contain topographic features that may funnel bats during migration.

The impact of the proposed Project on wildlife is expected to be minimal. There is potential for avian and bat collisions with facility turbines or meteorological towers. Additional impacts may include a small reduction in the available habitat that some of the wildlife uses for forage or cover. Operation of the wind farm will not change the existing land use.

7.16.3 Mitigative Measures

The following measures will be used, to the extent practicable, to help avoid potential impacts to wildlife in the Project site during selection of the turbine locations and subsequent development and operation:

- ♦ PPM will exclude established wildlife and recreation areas from consideration for wind turbines, access roads, or feeder/collector line placement. In addition, PPM proposes buffers of 0.25 miles around USFWS WPAs and 500 feet around large wetland complexes to minimize potential for wildlife impacts. The USFWS is amenable to these buffers.
- ♦ PPM contracted WEST to conduct a Phase I screening of existing biological resources at the site, including threatened and endangered species, birds, and bats. This report is attached as Appendix C.3.

- ◆ PPM contracted WEST to conduct pre- and post-construction avian monitoring at the site. The proposed scope of work is attached in Appendix C.5. WEST will also conduct post-construction bat fatality monitoring.
- ◆ PPM is coordinating with USFWS regarding avian monitoring and minimization of impacts to WPAs and easement areas. PPM is also coordinating with the GFD to minimize impacts.
- ◆ PPM will conduct preconstruction inventories of wetlands, native prairies, and woodlands in the vicinity of proposed turbines, access roads, and associated facilities to minimize impacts at the site. Initial site inventories have been conducted and more detailed inventories will occur once turbine siting is completed to assess the construction zone. These inventory reports will be filed with the PSC prior to Project construction.
- ◆ PPM will construct wind turbines using tubular monopole towers and turbines will be minimally lit according to FAA requirements.
- ◆ PPM proposes to place the electrical collection system from the turbines to the Project Substation underground, if site conditions are favorable.
- ◆ PPM will avoid or minimize disturbance of individual wetlands or drainage systems during construction and operation of the Project.
- ◆ PPM will avoid or minimize placement of turbines in high quality native prairie tracts.
- ◆ PPM will protect existing trees and shrubs where practicable. If impacts are unavoidable, PPM will replace existing trees and shrubs at a 2:1 ratio at the site and will keep the vegetation alive for five years.
- ◆ PPM will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, BMPs for erosion and sediment control (SN 19389 9/99) will be utilized. These practices include: Temporary Seeding, Permanent Seeding, Mulching, Filter Strips, Erosion Blankets, Grassed Waterways, and Sod Stabilization.
- ◆ PPM will revegetate non-cropland and pasture areas with seeding mix as recommended by USFWS and NRCS.
- ◆ PPM will inspect and control of noxious weeds in the vicinity of the turbines, access roads, and associated facilities immediately after construction and periodically for the life of the Project.

PPM is committed to minimizing wildlife impacts within the Project site. PPM will design their facility to minimize avian impacts by avoiding high use wildlife habitat, using tubular towers to minimize perching, placing electrical collection lines underground, and minimizing infrastructure.

7.17 RARE AND UNIQUE NATURAL RESOURCES

7.17.1 Description of Resources

The USFWS, GFD and NDPRD departments were contacted to review the Project site for threatened and endangered species and unique habitats. In response to a request for a project review, the USFWS identified the following federally-listed threatened and endangered species for Pierce County:

- ♦ Whooping Crane (Endangered)
- ♦ Bald Eagle (Threatened)
- ♦ Piping Plover (Threatened)

Ms. Karen Kreil of the USFWS Endangered Species program in Bismarck, North Dakota, identified the piping plover as the most significant federally-listed species in Pierce County. There are several piping plover critical habitats in Pierce County, but no site is located within the Project site vicinity. In addition, areas in Pierce County are used by whooping cranes that congregate during migration. Mr. Stan Kohn of the GFD maintains a listing of whooping crane sightings in the state. He stated that Pierce County has more sightings of migratory whooping cranes in the fall than the spring. The whooping crane sightings are spread out across the county where the birds utilize wetlands and shallow lakes. Areas that the whooping cranes use more frequently in Pierce County include Round Lake, located approximately 10 miles west of the Rugby site, and Horseshoe Lake, located approximately 10 miles southeast of the Rugby Site. Potential use of the Project site by these Federal species of concern is more completely reviewed in the attached Phase I Screening Report (Appendix C.3, p.4-6)

The GFD reviewed the Project and identified native prairie habitats as potential areas of concern. PPM will conduct a pre-construction inventory of native prairie habitats and will attempt to avoid high quality prairie areas.

The NDPRD maintains a Natural Heritage Inventory Database (NHID), which is the most complete source of data on North Dakota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features. No threatened and endangered species or unique habitats were identified within the Project site vicinity, however they did state that there is a lack of survey data in the area (Appendix D).

7.17.2 Impacts

No impacts to Rare and Unique Resources are anticipated.

7.17.3 Mitigative Measures

No impacts are anticipated to Rare and Unique Resources. A pre-construction inventory of existing native prairie, woodlands, and wetlands will be conducted in the Project site. PPM will avoid the resources identified to the extent practicable.

7.18 SUMMARY OF IMPACTS

Table 16 summarizes the resources that will be impacted as a result of the Project and the appropriate mitigation.

**Table 16
Summary of Impacts and Mitigation**

Resource	Impact	Mitigation
Demographics	Primarily positive due to increased expenditures during construction and the long term benefits of an increased tax base of the county due to property taxes.	No adverse impacts are anticipated.
Land Use	Approximately 62 acres of land will be impacted for gravel access roads and six acres of land for the 1.5 MW turbines. Approximately 48 acres of land will be impacted for gravel access roads and three acres of land for the 3.0 MW turbines. An additional three acres of land will be required for the O&M facility and substation. Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas.	PPM will work with landowners and regulatory agencies to minimize impacts of the Project.
Public Services	No impacts are anticipated.	PPM will utilize station service from the local electrical utility. MISO will suggest appropriate configurations for the electrical system, and PPM will abide by the recommendations to prevent impacts to the transmission system.
Human Health and Safety	No impacts are anticipated.	Turbines will be lighted to comply with FAA requirements. PPM will follow “prudent avoidance” methods to minimize EMF exposure. A variety of security measures will be implemented to reduce the chance of physical and property damage.
Noise	No impacts are anticipated to noise-sensitive resources.	PPM will locate turbines so the maximum level of 50 dBA is not exceeded at occupied residences.
Visual	Visual impacts will occur. The impacts are based on a subjective human response.	PPM will work with landowners and agencies to site turbines. They will not be located in environmentally sensitive areas. Existing infrastructure will be used where possible. Cut and fill areas will be minimized and mitigated as appropriate.
Cultural and Archaeological	No impacts to previously identified cultural resources are anticipated.	PPM has completed a Class I Cultural Resources Inventory for the Project. PPM will conduct a Class III inventory of construction areas as needed. PPM will make every effort to avoid any resources identified throughout the life of the Project. If avoidance is not possible, PPM will work with the North Dakota SHPO to mitigate potential impacts.
Recreational Resources	Visual impacts to recreational resources are likely and are limited to individuals using the resources.	WPAs will be avoided; no turbines will be located within 0.25 miles of WPAs.

Resource	Impact	Mitigation
Land Based Economies	A total of 68 acres of land will be impacted for the 1.5 MW turbines and 51 acres for the 3.0 MW turbines. Associated facilities will impact approximately 3 acres of land. Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas. Approximately 85 percent of the site is agricultural land.	PPM will work with landowners to minimize impact to their land.
Soils	Approximately 68 acres of land will be impacted for the 1.5 MW turbines and access roads. Approximately 51 acres of land will be impacted for the 3.0 MW turbines and access roads. Approximately 3 acres of land will be impacted by the associated facilities. Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas. Impacts will be limited to land needed for the turbine foundations, access roads, and associated facilities.	BMPs for erosion and sediment control will be utilized to minimize wind and water erosion at the site. Only land needed for the facility will be impacted. Temporarily disturbed areas will be restored.
Geologic and Groundwater Resources	No impacts to groundwater resources are anticipated. It is possible that sand and gravel resources could be made unavailable.	Wind turbines will be sited to avoid known sand and gravel resources to the extent practicable.
Surface Water and Floodplain Resources	Access roads and turbines will be located and constructed in such a manner that no impacts are anticipated.	Impacts to surface waters will be avoided. PPM will implement BMPs to minimize erosion and sedimentation at the site.
Wetlands	No impacts are anticipated.	If impacts cannot be avoided once micro-siting is complete, PPM will work with the USFWS, USACE, and the State of North Dakota to obtain permits and create required mitigation.
Vegetation	Approximately 68 acres of land will be impacted for the 1.5 MW turbines and access roads. Approximately 51 acres of land will be impacted for the 3.0 MW turbines and access roads. Three acres of vegetation will be impacted by the O&M facility and substation. Approximately 8 acres of land will be temporarily impacted for contractor staging and lay down areas.	PPM will work with the USFWS to minimize impacts. PPM will avoid existing trees and shrubs as practicable. PPM will use BMPs during construction and operation to minimize impacts. If impacts to trees or shrubs cannot be avoided, the individual trees or shrubs will be replaced at a ratio of 2:1 and will be kept alive for five years. Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations.
Wildlife	Impacts to wildlife populations are expected to be minimal. Potential avian and bat collisions may occur, but are anticipated to be relatively small.	A variety of mitigative measures will be implemented, as discussed in Section 7.17.3. These include designing the facility to specifically minimize avian impacts. Pre-construction monitoring will be completed for avian species. Post-construction monitoring of avian and bat species will occur.
Rare and Unique Natural Resources	Impacts to rare and unique natural resources are not anticipated.	No additional mitigative measures are necessary.

8.0 PUBLIC COORDINATION

Keeping the public informed on the status of the Project is key component to its success. Principal stakeholders in the Project are landowners that have entered into agreements with PPM to provide wind rights for the Project. PPM has provided written Project updates to the landowners and will continue to do so as it moves forward. In addition, PPM recently hosted a landowner meeting to provide an update on, and to answer questions on, the Project.

PPM has also met with Pierce County Commissioners representing the Project area and staff to inform them of the Project, discuss local permits and answer questions. PPM will continue to meet with County officials as the Project moves forward and PPM seeks a conditional use permit from the County.

PPM has met with Pierce County area state legislators to inform them of the Project. In addition, PPM has been working with key state agencies including the Department of Commerce, the Land Department, the North Dakota Game and Fish Department to inform them of the Project and to address areas of interest particular to each department.

PPM has also been working with key federal agencies that might have an interest in the Project including the United States Fish and Wildlife Service.

PPM is committed to keeping key stakeholders engaged in the Project as it moves forward. PPM expects to host another landowner meeting before the PSC public hearing.

9.0 IDENTIFICATION OF POTENTIAL PERMITS/APPROVALS

The federal and state permits or approvals that have been identified as potentially being required for the construction and operation of the Project are shown in Table 17. Permits dependent on the final site layout will be applied for after receiving PSC approval, but prior to construction. A Waiver of Procedures and Time Schedules, Certificate of Corridor Compatibility, and Route Permit will be obtained prior to construction of the proposed 230 kV transmission line.

**Table 17
Potential Permits and Approvals Required for Construction
and Operation of the Proposed Facility**

Agency	Type of Approval	Status *	Need
Federal Approvals			
USFWS	Compatibility Analysis of Disturbed Easements	3	If constructing in wetlands within wetland easements or in grassland easements, then compatibility analysis by USFWS is required.
	Right of Way Permit	3	If use is compatible, then a Right of Way Permit is required for permanent disturbance in wetlands within wetland easements or in grassland easements.
	Special Use Permit	3	If use is compatible, then a Special Use Permit is required for temporary disturbance in wetlands within wetland easements or in grassland easements.
USACE	Section 404 Permit	3	Permit required for fill in jurisdictional waters of the US. Based on review by USACE, no jurisdictional waters are present at Project site. No permit anticipated for Project.
FAA	Form 7460-1, Notice of Proposed Construction	2	Notice and approval are required for structures over 200 feet in height. FAA approval of lighting and marking of turbines is required.
	Form 7460-2, Part 1, Notice of Actual Construction or Alteration	4	Required to provide FAA with final construction as-built information for their records.
Environmental Protection Agency	Spill Prevention Control and Countermeasure (SPCC) Plan	2	Required if the substation facility has greater than 1320 gallons of oil. A copy of the plan will be maintained on file with the substation's owner/operator and will be reviewed by the certifying engineer every five years.

Agency	Type of Approval	Status *	Need
State of North Dakota			
Public Services Commission	Certificate of Site Compatibility	1	Required for construction of generation facility over 50 MW in size.
North Dakota Department of Health	401 Water Quality Certification	3	Required for fill in jurisdictional waters of US. No permit anticipated for Project.
	NPDES Permit: General Construction Storm Water	2	Required for disturbance of over 1 acre of land. Must prepare a Storm Water Pollution Prevention Plan (SWPPP).
North Dakota Division of Emergency Management	Emergency Planning and Community Right-to-Know Act (EPCRA) Tier II report	2	Required for owner/operators of facilities containing hazardous materials. A copy of the report must be filed annually by March 1 st .
North Dakota Department of Health – Lake Region District Health Unit	Septic Tank and Drainfield Permit	2	Required for installation of septic system at O&M facility.
SHPO	Section 106 Compliance Approval	3	Section 106 Compliance Approval is required if there is federal involvement in the Project (i.e. federal funding or wetland fill). Need for approval is not anticipated at this time.
North Dakota State Land Board	Easements	3	Required if crossing lands owned by State Land Board.
North Dakota Highway Patrol	Overheight/Overweight Permit	2	Permit required for hauling construction equipment and materials on State Highways.
North Dakota Department of Transportation	Road Approach/Access Permit	2	Permit required for construction of access roads from State Highways.
	Utility Permit/Risk Management Documents	2	Permit required for utility crossings on State Highway ROW.
Local Permits			
Pierce County	Conditional Use Permit	1	Permit required for project construction.
	Haul Road Agreement	2	Permit required for hauling construction equipment and materials on County Roads.
	Utility Permit	2	Permit required for utility crossings on County road ROW

* Status Explanation:

- 1 Applied – Decision Pending
- 2 Will Apply Once Certificate is Received
- 3 Final Layout will Determine Whether Permit/Approval is needed
- 4 Will Apply Once Construction is Complete

10.0 FACTORS CONSIDERED

The North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the Commission in the evaluation and designation of the site of the facility.

10.1 PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES, AND THE ENVIRONMENT

The preceding sections discuss the research and investigations relating the effects of the proposed facility on public health and welfare, natural resources, and the environment. These effects and the proposed mitigation to minimize these effects are summarized in Section 7.18.

10.2 TECHNOLOGIES TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS

PPM Energy will utilize the most recent technologies that minimize impacts to the environment. Current wind turbine technologies, including the equipment and siting tools, optimize the wind and land resources.

10.3 POTENTIAL FOR BENEFICIAL USES OF WASTE ENERGY

This factor is not applicable to this Project. No waste energy is created using wind energy.

10.4 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Unavoidable adverse environmental effects include the visual impacts associated with the Project as well as those impacts related to the placement and use of the land within the site. The visual character of the site will be changed due to the construction of the Project. In order to construct the facility, access roads and turbine pads are necessary for the operation and maintenance of the facility. The preliminary turbine and access road layout is expected to impact approximately 68 acres of land for the 1.5 MW turbines and approximately 51 acres of land for the 3.0 MW turbines. Approximately 10 acres of land will be acquired for the O&M facility and Project Substation, of which three acres will be occupied by the footprint of these facilities.

10.5 ALTERNATIVES TO THE PROPOSED SITE

An alternative to the proposed site is discussed in Section 1.3.1. PPM believes that the proposed site is the most viable alternative. PPM is committed to being flexible on the preliminary site layout and will work closely with landowners and regulatory agencies to examine all reasonable alternatives to the preliminary site layout.

10.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but include those resources primarily related to construction.

Construction resources that will be used include aggregate resources, concrete, steel, and hydrocarbon fuel. Each steel turbine requires the construction of a concrete base 40 to 60 feet across and seven to 10 feet thick. Access roads will require aggregate resources for their construction and maintenance. During construction vehicles will be traveling to and from the site, utilizing hydrocarbon fuels.

10.7 DIRECT AND INDIRECT ECONOMIC IMPACTS

Direct economic impacts include the short-term impacts associated with up to 78 acres of agricultural land being removed from production due to conversion to turbine sites, associated access roads, and associated facilities. In general, agricultural areas surrounding each turbine can still be farmed, and landowners will be compensated for the land occupied by the wind turbines and associated facilities.

The remaining direct and indirect economic impacts are primarily positive. To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in Pierce County will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and the state by circulation and recirculation of dollars paid out by the Applicant as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services benefit businesses in the county and the state.

Long-term beneficial impacts to the county's tax base as a result of the construction and operation of the wind farm will contribute to improving the local economy in this area of North Dakota. The development of wind energy in this region will be important in diversifying and strengthening the economic base of central North Dakota. Additional revenues are expected from property and income taxes.

Continuing to establish the north-central region of North Dakota as an important producer of alternative energy sources, may spur the development of wind-related businesses in the area, in turn contributing to the economic growth in the region.

10.8 EXISTING DEVELOPMENT PLANS OF THE STATE, LOCAL GOVERNMENT AND PRIVATE ENTITIES AT OR IN THE VICINITY OF THE SITE

No conflicts are anticipated with existing state and local government and private entities' development plans.

10.9 EFFECT OF SITE ON CULTURAL RESOURCES

PPM has reviewed cultural resources information on file at the SHPO for the study area and prepared a Class I Cultural Resources Inventory (Appendix C.6). A review of 14 identified studies and additional records at the SHPO identified one previously recorded archaeological resource and two archaeological site leads within one mile of the site. Currently, no impacts are anticipated to known cultural resources in the site. PPM is committed to minimize impacts to these resources and will avoid these resources and any additional resources identified throughout the life of the Project. If avoidance is not possible, PPM will work with the North SHPO to mitigate potential impacts.

There are no anticipated impacts to paleontological resources because the site is covered with over 100 feet of glacial sediments overlying the Cretaceous Fox Hills Formation.

10.10 EFFECT OF SITE ON BIOLOGICAL RESOURCES

PPM has implemented measures to avoid and minimize effects to biological resources at the proposed site. The impact of the Project on wildlife is expected to be minimal. There is potential for avian and bat collisions with facility turbines or meteorological towers. The site will be designed to minimize impacts to those species.

10.11 PROBLEMS RAISED BY AGENCIES

Agencies were contacted to comment on the Project. The summary of comments received below apply to the proposed Rugby Wind Farm. Other comments were received in regard to the transmission line corridor, and those comments are summarized in the Transmission Line Application, which was filed concurrent with this application.

10.11.1 North Dakota Game and Fish Department

The GFD reviewed the Project site for wildlife concerns. Their primary concern is the disturbance of native prairie (Appendix D). They also recommended that the USFWS wind turbine siting guidelines be implemented as appropriate. PPM has conducted a voluntary assessment of avian resources at the site using the USFWS "Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines." PPM has contracted with WEST to do preconstruction and post construction monitoring of the site. PPM proposes to survey the site for biological resources such as native prairie and will address potential impacts during micrositing.

10.11.2 U.S. Fish and Wildlife Service

Concerns of the USFWS focused on migratory birds, USFWS property interests, wetland, grassland, and woodland resources, and threatened and endangered species. In relation to migratory birds, the USFWS asked that overhead power lines be constructed in accordance with the current guidelines for preventing raptor electrocutions and asked that PPM conduct collision monitoring studies to determine the effect of several factors related to the Project on avian species. No collisions or electrocutions with overhead power lines are anticipated because most of the Project power collector system will be placed underground and any aboveground collector structures and lines will be constructed using ‘bird-safe designs’ per the Avian Power Line Interaction Committee (APLIC) recommendations. PPM had WEST conduct a Phase I screening of the Project site (Appendix C.3) and based on the results of that study developed pre- and post-construction biological monitoring protocols (Appendix C.5). PPM is coordinating with the USFWS on site layout and monitoring for avian and bat species.

PPM has obtained the information for the wetland and grassland easements leased by the USFWS. PPM proposes to work closely with the USFWS to minimize impacts to these lands. Habitats within the Project site such as native prairie and wetlands were highlighted as USFWS areas of concern. USFWS wetland easements are held throughout the Project site but grassland easements are only held in portions of three sections in the northwestern part of the Project site (Sections 8, 9 and 10, T158N, R72W) (see Figure 9). Any direct impacts to wetlands or grasslands within the respective USFWS easements will result in a compatibility assessment from local USFWS staff. The process will consider the magnitude of the impact, the type or quality of the habitat which is impacted, and the feasibility of avoiding the impact. If compatibility is found, a ROW permit will be issued for the impact. The USFWS grassland easements also restrict turbine density to one turbine per quarter-section. The USFWS also recommended a series of mitigative measures to minimize impacts to existing habitats in their letter to HDR Engineering (Appendix D). PPM will implement these measures as they are applicable to the Project.

10.11.3 North Dakota SHPO

The SHPO recommend that a Class I cultural resources inventory be completed for areas that may be impacted by the Project. They also stated that a Class III cultural resources inventory may also be necessary. PPM has completed the Class I cultural resources inventory. Fourteen cultural resources reports were identified for the site boundaries. A review of these studies and additional records at the SHPO identified one previously recorded archaeological resource and two archaeological site leads (Table 12).

PPM continues to consult with the SHPO during the preparation of the Class I cultural resources inventory to identify the need for a Class III inventory. The inventory will also address the probability for archaeological sites within the Project site and, if warranted, recommend survey strategies to identify additional cultural resources within the project APE.

If the Class I and/or Class III cultural resources inventories should determine that such a plan is appropriate, PPM would also develop a discovery plan to be in place should previously unknown archaeological resources or human remains be inadvertently encountered during the Project. The plan would outline the framework for handling such discoveries in an efficient and legally compliant manner. The discovery plan may include the following topics: construction contractor training, identification of resources in the field, contact information for PPM-designated professionals to address a discovery, procedures for avoidance, and associated tasks in the event of work stoppage in a construction area. With regard to a discovery of human remains, procedures would be followed to ensure that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.

10.11.4 North Dakota Geological Survey

Information regarding geologic resources specific to the Project were provided. No problems were identified (Appendix D).

10.11.5 North Dakota Parks and Recreation Department

The Natural Heritage Inventory had no records within the Project Site. The North Dakota Parks and Recreation Department (NDPRD) stated the Project would not affect State park lands or land and water conservation fund recreation projects. The NDPRD recommended impacted areas be revegetated with native species (Appendix D).

10.11.6 North Dakota Office of Attorney General

The Attorney General's Office was asked to comment on the Project. The Attorney General and members of his staff are prohibited from giving legal advice, opinions, or assistance to private businesses (Appendix D).

10.11.7 North Dakota Department of Commerce

No problems were identified. A Letter of Clearance was given to the Project – State Application Identifier No.: ND050202-0039 (Appendix D).

10.11.8 North Dakota Department of Health

The North Dakota Department of Health was asked to review the Project with respect to environmental impacts. The Department of Health believes the environmental impacts will be minor and can be controlled by proper construction methods. Appendix D is their letter which provides comments and guidance on fugitive dust emissions, degradation of waterways, storm water management, and noise.

10.11.9 North Dakota Department of Transportation

The North Dakota Department of Transportation asked that PPM obtain the appropriate permits and risk management documents from the Devils Lake District office (Appendix D).

10.11.10 North Dakota State Water Commission

The State Water Commission asked that waste material be disposed of properly. No floodplain was identified in the Project site (Appendix D).

10.11.11 Natural Resources Conservation Service

The NRCS did not identify any problems with the Project. Since there are no federal funds, the Farmland Protection Policy Act (FPPA) does not apply. The NRCS encouraged PPM to consider the purposes of FPPA in the site selection (Appendix D). Temporarily disturbed areas will be reseeded per USFWS and NRCS recommendations to blend in with existing vegetation.

10.11.12 North Dakota State Land Department

The State Land Department identified school trust lands that they own within the Project site. Easement agreements or a permit from the Land Board will be required for the use of those lands (Appendix D).

10.11.13 U.S. Army Corps of Engineers

The USACE made a preliminary determination that there are no jurisdictional waters as defined by the USACE within the Project Site (Appendix D). The Project is not anticipated to impact jurisdictional waters of the United States; therefore permits through the USACE are not anticipated. No additional issues were raised.

10.11.14 Aeronautics Commission

PPM sent a letter to the Aeronautics Commission, January 25, 2005 (Appendix D). No response has been received.

10.11.15 North Dakota Department of Agriculture

PPM sent a letter to the North Dakota Department of Agriculture, January 25, 2005 (Appendix D). No response has been received.

10.11.16 North Dakota Department of Human Services

PPM sent a letter to the North Dakota Department of Human Services, January 25, 2005 (Appendix D). No response has been received.

10.11.17 North Dakota Department of Labor

PPM sent a letter to the North Dakota Department of Labor, January 25, 2005 (Appendix D). No response has been received.

10.11.18 North Dakota Department of Career and Technical Education

PPM sent a letter to the North Dakota Department of Career and Technical Education, January 25, 2005 (Appendix D). No response has been received.

10.11.19 North Dakota Governor

PPM sent a letter to the North Dakota Governor John Hoeven, January 25, 2005 (Appendix D). No response has been received

10.11.20 North Dakota Indian Affairs

PPM sent a letter to North Dakota Indian Affairs, January 25, 2005 (Appendix D). No response has been received

10.11.21 North Dakota Office of Management and Budget

PPM sent a letter to the North Dakota Office of Management and Budget, January 25, 2005 (Appendix D). No response has been received

10.11.22 North Dakota Soil Conservation Committee

PPM sent a letter to the North Dakota Soil Conservation Committee, January 25, 2005 (Appendix D). No response has been received

10.11.23 Pierce County Soil Conservation District

PPM sent a letter to the Pierce County Soil Conservation District, January 25, 2005 (Appendix D). No response has been received

11.0 QUALIFICATIONS OF CONTRIBUTORS TO SITING STUDY

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
MICHELLE BISSONNETTE Vice President, Senior Environmental Consultant HDR Engineering	<p>Ms. Bissonnette supervises the Environmental and Resource Management Department and manages environmental assessment and permitting efforts as well as designs, manages, and conducts land reclamation and wetland restoration activities. She develops site-specific aesthetic assessments, designs visual improvement plans, and oversees revegetation plans. She is also responsible for developing computer-aided design graphics for presentations.</p> <p>As an environmental consultant, Ms. Bissonnette is responsible for researching compliance requirements for federal state and local permits. She works closely with regulatory agencies on utility and transportation related projects. She has worked on a variety of utility projects from power generation to transmission and distribution as well as wind, pipeline, and combustion turbine projects. She has also worked on a number of roadway, railroad and river corridor projects.</p> <p>B.S., Landscape Architecture, University of Minnesota, 1982 Foreign Studies/French Minor, University of Grenoble, France, 1977</p>
SARAH EMERY, PG Senior Environmental Scientist HDR Engineering	<p>Ms. Emery is a Senior Environmental Scientist with over eleven years of experience as an environmental consultant. She is experienced in wetland delineation, permitting, and mitigation; biological resource inventories; NEPA/environmental permitting; Phase I environmental assessments; and hydrogeology and remedial investigation of contaminant impacts to soil and ground water. She is experienced with resource evaluation and micrositng at utility-scale wind facilities.</p> <p>Registered Professional Geologist, Minnesota, No. 30677, 1999 M.S., Geological & Related Sciences (Geology), University of MN Twin Cities, 1996 M.S., Natural Resources (Forestry), University of MN Twin Cities, 1994 B.S., Environmental Sciences/Studies (Fisheries and Wildlife), Michigan State University, 1985</p>
BRUCE MOREIRA Environmental Scientist HDR Engineering	<p>Mr. Moreira has three years of experience in wetland delineation, GIS systems, regulatory documentation, and project management. He specializes in wetland delineation, GIS mapping and data collection, plant ecology, database construction/support, and natural resource management. He has a basic knowledge of AutoCAD systems and file transfer between GIS and CAD programs. He has field experience with Trimble, Leica, CMT and Garmin GPS units and their maintenance.</p> <p>M.S., Forestry, Department of Forest Resources, University of Minnesota, 2001 B.A., Biology, Reed College, Portland, Oregon, 1997</p>
ANGELA PINER Environmental Scientist HDR Engineering	<p>Ms. Piner is currently an Environmental Scientist with HDR. She has four years of experience with environmental permitting and two years of academic research. She has experience permitting under Sections 401 and 404 of the Clean Water Act and conducting wetland delineations. Ms. Piner also assists senior scientists and project managers with project research and report writing.</p> <p>B.S., Biological Sciences, California Polytechnic State University, San Luis Obispo, 1999</p>
CRAIG RASMUSSEN, P.E., PTOE Project Manager, Transportation HDR Engineering	<p>Mr. Rasmussen specializes in traffic engineering with emphasis on operations analyses / capacity modeling, multi-agency studies, safety studies, and preparation of construction documents. He has gained increasingly progressive responsibility with project delivery on a variety of projects often combining transportation elements of highway and rail.</p> <p>B.S., Civil Engineering, University of North Dakota, 1999 Professional Engineer, 2003 (Minnesota No. 42711, North Dakota No. 5130) Professional Traffic Operations Engineer, 2003 (No. 1156)</p>

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
SCOTT REED Senior Environmental Scientist HDR Engineering	<p>Mr. Reed has over twelve years of experience in managing environmental projects including Environmental Assessments, Environmental Assessment Worksheets, wetland and water resource permitting, Phase I/Phase II Environmental Site Assessments, Drilling Investigations, Remedial Investigations, and the development and implementation of Response Action Plans and Corrective Actions for transportation projects. Mr. Reed has extensive experience with the Minnesota and federal agency regulatory programs.</p> <p>MBA., Environmental Sciences/Studies (Environmental Management Concentration), University of Minnesota System, 2002 B.S., Geological & Related Sciences (Geology), University of Minnesota System, 1991</p>
BETH REGAN, CIH Environmental Scientist HDR Engineering	<p>Ms. Regan has more than 14 years professional consulting experience in the environmental health and safety field. This includes 12 years of environmental laboratory management and analytical quality control experience. Ms. Regan is a certified industrial hygienist, and she is responsible for researching and performing industrial hygiene, environmental acoustics and environmental compliance services.</p> <p>Ms. Regan also has project experience in mobile and stationary source noise monitoring and modeling. Her experience includes extensive use of the Federal Transit Authority (FTA) and the Federal Railroad Administration (FRA) Noise and Vibration Impact Assessment Methodologies, the Federal Highway Administration Traffic Noise Model (TNM) and spreadsheet models for stationary noise source assessment.</p> <p>Certified Industrial Hygienist, No. 8779 CP, 2004 B. A., Biology, Augustana College, Sioux Falls, South Dakota, 1987</p>
DAN SCHMIDT GIS Manager HDR Engineering	<p>Mr. Schmidt is responsible for Geographic Information Systems (GIS) development in civil, environmental, and architectural areas. He works with ArcGIS, ArcView, and a variety of system support software. He provides development of GIS databases, spatial analysis, GPS data collection and analysis, and mapping services. Mr. Schmidt has extensive experience in GIS evaluation and micro siting of utility-scale wind projects.</p> <p>M.A., Geography – Geographic Information Systems, Western Illinois University, 1994 B.A., Geography, University of Illinois at Chicago, 1991</p>
TIM CASEY, QEP Environmental Specialist HDR Engineering	<p>Mr. Casey is HDR's Environmental Acoustics Program Manager and has over ten years of experience leading HDR's Environmental Acoustics efforts. He specializes in noise and vibration monitoring and modeling for stationary and mobile sources including railroads, highways, combustion turbines, diesel generators, pumps, industrial and municipal installations, etc. Extensive use of the FHWA Stamina 2.0/Optima model, FTA transit noise and vibration analysis methodologies, and PC-based GIS technology. Additional training and experience on FHWA Traffic Noise Model (TNM) 1.0. Mr. Casey's experience includes presentations at public meetings, before city councils, and expert witness testimony for projects in locations throughout the United States and Puerto Rico. Mr. Casey holds the professional certification of Qualified Environmental Professional (QEP).</p> <p>Bachelor of Science, Biological/Life Sciences, Saint Xavier University, 1988 Associate of Science, Science, Valley Community College, 1986</p>
JANE GORDEN Environmental Sciences Administrative Assistant HDR Engineering	<p>Ms. Gorden has over 24 years of administrative experience. During this time she has assisted in research, interviews, data collection and documentation for 20 Phase I Environmental Site Assessments. She has also contributed in the completion of several environmental assessments, impact statements, noise and air analysis reports and various other environmental reports.</p> <p>Bachelor of Arts, English Language & Literature, University of Minnesota System, 1980</p>

NAME PROJECT ROLE	EDUCATION AND PROFESSIONAL EXPERIENCE
CAROLINE STEVERMER Environmental Sciences Administrative Assistant HDR Engineering	<p>Ms. Stevermer has over 20 years of administrative experience. She specializes in copy editing. For more than eight years, she worked on the editorial page production staff of a major metropolitan daily newspaper.</p> <p>Bachelor of Arts, History of Art, Bryn Mawr College, 1977.</p>
TIMOTHY SECK Manager, Midwest Renewables PPM Energy	<p>Mr. Seck is responsible for Midwest business development activities at PPM including new power project development. He has over 10 years of experience in the energy industry including two years at Kenetech Windpower and most recently eight years with Great River Energy. At Great River Energy, Mr. Seck was responsible for wind energy procurement including the 100 MW Trimont project and permitting/siting of transmission lines, natural gas plants and proposed thermal projects.</p> <p>Bachelor of Arts, St. Olaf College, 1989. Juris Doctor, William Mitchell College of Law, 1995.</p>
JAY HALEY President EAPC	<p>Mr. Haley has been involved in wind energy off and on since 1983. He spent 6 years as the Director of Engineering for an Aerospace firm and then 10 years as a Research Engineer for the Energy and Environmental Research Center at the University of North Dakota. Currently Mr. Haley is a Partner with EAPC Architects Engineers in Grand Forks, ND, and is recognized as one of the states leading wind energy experts. He has provided wind energy consulting services for a number of clients in North Dakota, South Dakota, Minnesota, Michigan, Illinois, Utah, and Idaho.</p> <p>Mr. Haley is a member of the North Dakota Wind Coordinating group, Wind Interests of North Dakota group, National Wind Coordinating Committee, and American Wind Energy Association; and Co-chair of the Energy Cluster for North Dakota's New Economy Initiative and Vice Chairman of the North Dakota Renewable Energy Partnership, and Founding Chairman of the Wind Energy Council.</p>
KEVIN ROMULD Mechanical Engineer EAPC	<p>Mr. Romuld has recently been involved in wind energy and prior to that he was designing HVAC systems for commercial facilities. He spent 5 years as a Lead Engineer for the Boeing Company in Seattle, WA and then 10 years as a Partner for a general contracting firm in Grand Forks, ND.</p> <p>Currently Mr. Romuld is a Mechanical Engineer for the firm EAPC Architects Engineers in Grand Forks, ND and aspires to become an expert in wind energy. This past year he consulted with clients on a number of wind projects located in North Dakota, Minnesota, South Dakota, Michigan, Kansas, Illinois, and Idaho. Kevin also provides support and training to users of WindPRO, a world leader in wind farm design software. Kevin has helped clients site and install wind-monitoring stations to collect wind data. He also does data analysis and correlations, develops wind resource maps, performs wind turbine comparisons, tests wind turbine park layouts, estimates turbine wake losses, capacity factors and annual energy production.</p> <p>Bachelor of Science, Mechanical Engineering, University of North Dakota</p>

12.0 REFERENCES

Aircraft Owners and Pilots Association (AOPA) Airport Directory 2003-2004.

American Bird Conservancy Wind Energy Policy. <http://www.abcbirds.org/policy/windpolicy.htm>. Retrieved 4/19/2005.

Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute and the Raptor Research Foundation. Washington, DC. 125 pp.

Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, DC. 78 pp.

Best Management Practices For Erosion And Sediment Control. North Dakota Department of Health. Division of Water Quality SFN 19389 (09/99)

Bluemle, John P., 1991. The Face of North Dakota. North Dakota Geological Survey, Educational Series 21.

Carlson, C.G. and Freers, T.F. 1975. Geology of Benson and Pierce Counties, North Dakota. North

Derby, C. 2005. Phase One Screening Report and USFWS PII Score: PPM Energy Site Rugby, North Dakota. Western Ecosystems Technology, Inc. Cheyenne, WY. 15 pp.

Dakota Geological Survey, Bulletin 59 – Part I, North Dakota State Water Commission, County Ground Water Studies 18 – Part I.

Energy Information Administration. 2002. State Electricity Profiles – North Dakota. Department of Energy. http://www.eia.doe.gov/cneaf/electricity/st_profiles/toc.html. Retrieved 1/27/05.

Flight Planning for General Aviation. <http://www.fltplan.com>. Retrieved 1/31/05.

Grover, S. 2002. Economic Impacts of Wind Power in Kittitas County, Final Report. Funded by State of Washington Office of Trade and Economic Development and the Energy Foundation. ECONorthwest. Portland, OR. 20 pp.

Mid-Continent Area Power Pool. 2004. Mid-Continent Area Power Pool Load and Capability Report, Final Draft. St. Paul, MN. pp. III3-III4.

NWCC. 2004. Wind Turbine Interactions with Birds and Bats: A Summary of Research Results and Remaining Questions. Resolve, Inc., Washington D.C., 7 pp.

National Institute of Environmental Health Sciences EMF-RAPID Program Staff, 1999. NIEHS Report on Health Effects from Exposure to Power Line Frequency Electric and Magnetic Fields. Research Triangle Park, NC.

North Dakota Department of Transportation. Pierce County 2002 Map Counts. Bismarck, ND.

North Dakota Department of Transportation. State of North Dakota GIS Base Map Data, Version 1.1a, 2000.

North Dakota Game and Fish Department. Wildlife Management Area Guide.
<http://www.state.nd.us/gnf/hunting/wildlife.html>. Retrieved January 2005.

North Dakota State Water Commission. Data Resources – Site Inventory Retrieval System.
<http://www.swc.state.nd.us/4DLink2/4dcgi/WellSearchForm>. Retrieved January 2005.

North Dakota State Water Commission. Water Permit Retrieval System.
<http://www.swc.state.nd.us/4DLink7/4dcgi/wpPermitForm>. Retrieved March 2005.

Northwest Economic Associates. 2003. Assessing the Economic Development Impacts of Wind Power. National Wind Coordinating Committee. Washington.
http://www.nationalwind.org/pubs/economic/econ_final_report.pdf.

PanAero Corporation. 1999. Wind Energy in North Dakota Final Report. Division of Community Service, State of North Dakota. <http://www.state.nd.us/dcs/energy/docs/windmark.pdf>. Retrieved 1/27/05.

Rugby Municipal Airport. <http://www.airnav.com/airport/KRUG>. Retrieved 2/1/05.

Theile, J.H., et al. 1978. Soil Survey of Pierce County, North Dakota. United States Department of Agriculture. Washington, D.C. 147 pp.

U.S. Census Bureau. 2000. “Census 2000 Summary File 1. Pierce County, ND; North Pierce UT, Pierce County, ND; Torgerson Township, Pierce County, ND.

U.S. Census Bureau. 2000. Census 2000 Summary File 3. Pierce County, ND; North Pierce UT, Pierce County, ND; Torgerson Township, Pierce County, ND.

U.S. Census Bureau. 2000. Fact Sheet, Lincoln County, MN.

U.S. Census Bureau. American Factfinder. <http://factfinder.census.gov/servlet/BasicFactsServlet>

U.S. Department of Agriculture. 2003 NRCS SSURGO Soils Data, Pierce County

U.S. Department of Agriculture. Geospatial Data Gateway. <http://datagateway.nrcs.usda.gov/>. Floodplain and watershed data. Retrieved Fall 2005.

U.S. Department of Agriculture, National Agriculture Imagery Program. 2003 NAIP Aerial Photography. Pierce County.

U.S. Department of Agriculture. NRCS STATSGO Statewide Soils Data North Dakota.

U.S. Fish and Wildlife Service. 2003. Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines. Washington, D.C. Wind Turbine Siting Working Group.
<http://www.fws.gov/r9dhcbfa/wind.pdf>

U.S. Fish and Wildlife Service. North Dakota Land Cover Classification. North Dakota.

U.S. Fish and Wildlife Service. America's National Wildlife Refuge System. <http://refuges.fws.gov/>. Retrieved January 2005.

U.S. Fish and Wildlife Service. Mountain-Prairie Region – North Dakota. <http://mountain-prairie.fws.gov/nd.html>. Retrieved January 2005.

USGS. 1998. Ecoregions of North Dakota and South Dakota. <http://www.npwrc.usgs.gov/1998/ndsdeco/>

13.0 DEFINITIONS

ADT	Average Daily Traffic
ANSI	American National Standards Institute
APE	Area of Potential Effects
ASTM	American Society for Testing and Materials
Asynchronous Generator	A cage-wound generator, also called an induction generator, used to generate alternating current.
BMPs	Best Management Practices; prevents soil erosion and sedimentation
Capacity	The capability of a system, circuit, or device for storing electric charge.
Certificate	Certificate of Site Compatibility
Class I Cultural Resources Inventory	Existing data inventory – a large-scale review and compilation of known cultural resource data.
Class III Cultural Resources Inventory	Intensive field inventory – complete surface inventory of a specific area.
Class 5 gravel	Crushed rock used in roadbase.
Commission or PSC	North Dakota Public Service Commission
CRP	Conservation Reserve Program
Corridor Certificate	Certificate of Corridor Compatibility
dBA	A-weighted decibel
Distribution	Relatively low-voltage lines that deliver electricity to the retail customer's home or business.
DOE	US Department of Energy
Electromechanical	Of, relating to, or being a mechanical process or device actuated or controlled electrically; especially being a transducer for converting electrical energy to mechanical energy.
EMF	Electric and Magnetic Field
EPC	Engineering, procurement, and construction
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
Ft	Foot/Feet

GE	General Electric
Gearbox	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly.
Generator	A machine by which mechanical energy is changed into electrical energy.
Geotechnical	A science that deals with the application of geology to engineering.
GFD	North Dakota Game and Fish Department
Hub	The central part of a circular object (as a wheel or propeller).
Interconnection	To be or become mutually connected.
kV	kilovolt
kW	kilowatt
MW	megawatt
m	meter
m/s	meter per second
MAPP	Mid-Continent Area Power Pool
Micrositing	The process in which the wind resources, potential environmentally sensitive areas, soil conditions, and other site factors, as identified by local, state and federal agencies, are evaluated to locate wind turbines and associated facilities.
MISO	Midwest Independent System Operator
mph	miles per hour
Nacelle	A streamlined enclosure (as for an engine), which houses the gearbox, generator, brake, cooling system and other electrical and mechanical systems.
NDDOT	North Dakota Department of Transportation
NESC	National Electric Safety Code
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDPRD	North Dakota Parks and Recreation Department
NHID	Natural Heritage Inventory Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O&M	Operations and maintenance facility

Otter Tail	Otter Tail Power Company
PII	Potential Impact Index
Pitch	The action or a manner of pitching; especially an up-and-down movement.
PPA	Power Purchase Agreements
PPM	PPM Energy, Inc.
Project, the	Rugby Wind Farm
PSC or Commission	North Dakota Public Service Commission
PTC	Production Tax Credit
RECs	Recognized Environmental Conditions
Resistance	The opposition offered by a body or substance to the passage through it of a steady electric current.
Rotor	The rotor consists of three blades mounted to a rotor hub.
RD	Rotor Diameter: Diameter of the rotor from the tip of a single blade to the tip of the opposite blade.
ROW	Right-of-Way
rpm	Revolutions per minute
SCADA	Supervisory Control and Data Acquisitions (communications technology)
SHPO	North Dakota State Historic Preservation Office
Step-up Transformer	A transformer that increases voltage
Substation	A subsidiary station in which electric current is transformed.
SWPPP	Storm Water Pollution Prevention Plan
Torque	A force that produces or tends to produce rotation or torsion; also a measure of the effectiveness of such a force that consists of the product of the force and the perpendicular distance from the line of action of the force to the axis of rotation : a turning or twisting force.
Transformer	An electrical device by which alternating current of one voltage is changed to another voltage.
Transmission	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly.
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
UT	Unincorporated Township
WEST	Western EcoSystems Technology, Inc
WMD	Wetland Management District
WPAs	Waterfowl Protection Areas
Yaw	To deviate erratically from a course (as when struck by a heavy sea); especially to move from side to side: to turn by angular motion about the vertical axis.

FIGURES

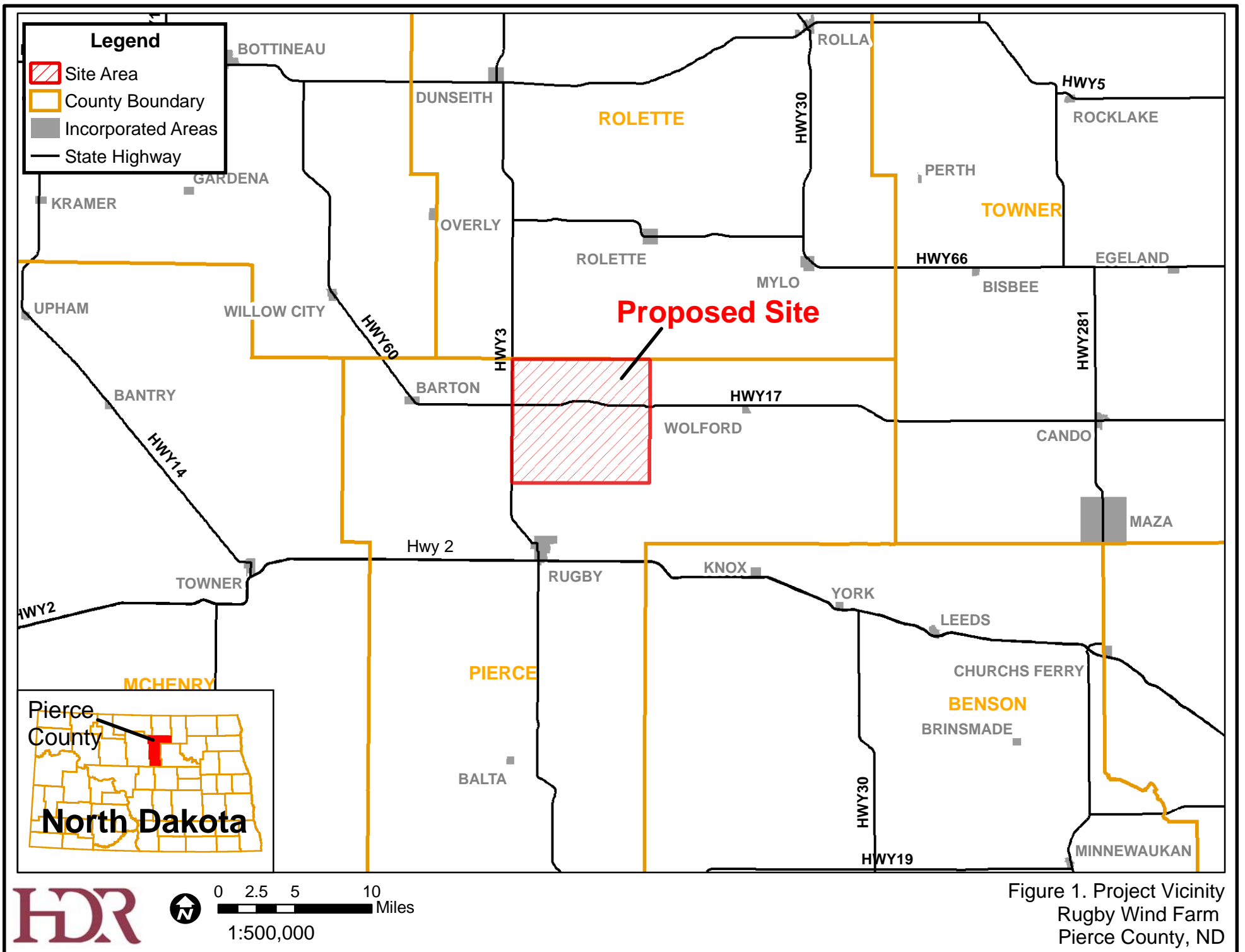


Figure 1. Project Vicinity
Rugby Wind Farm
Pierce County, ND

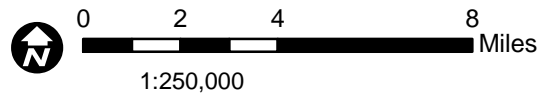
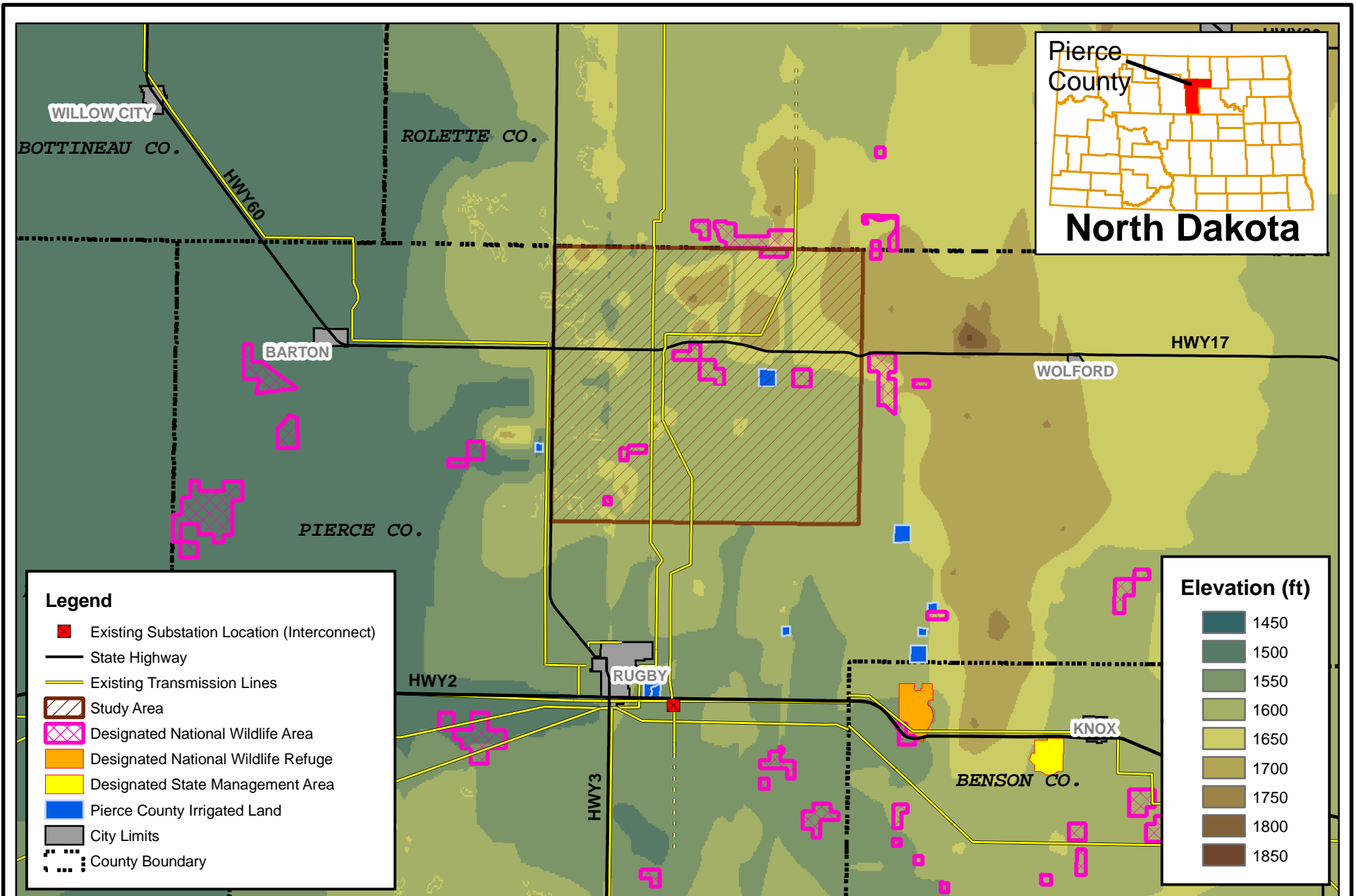


Figure 2. Study Area Selection Map
Rugby Wind Farm
Pierce County, ND

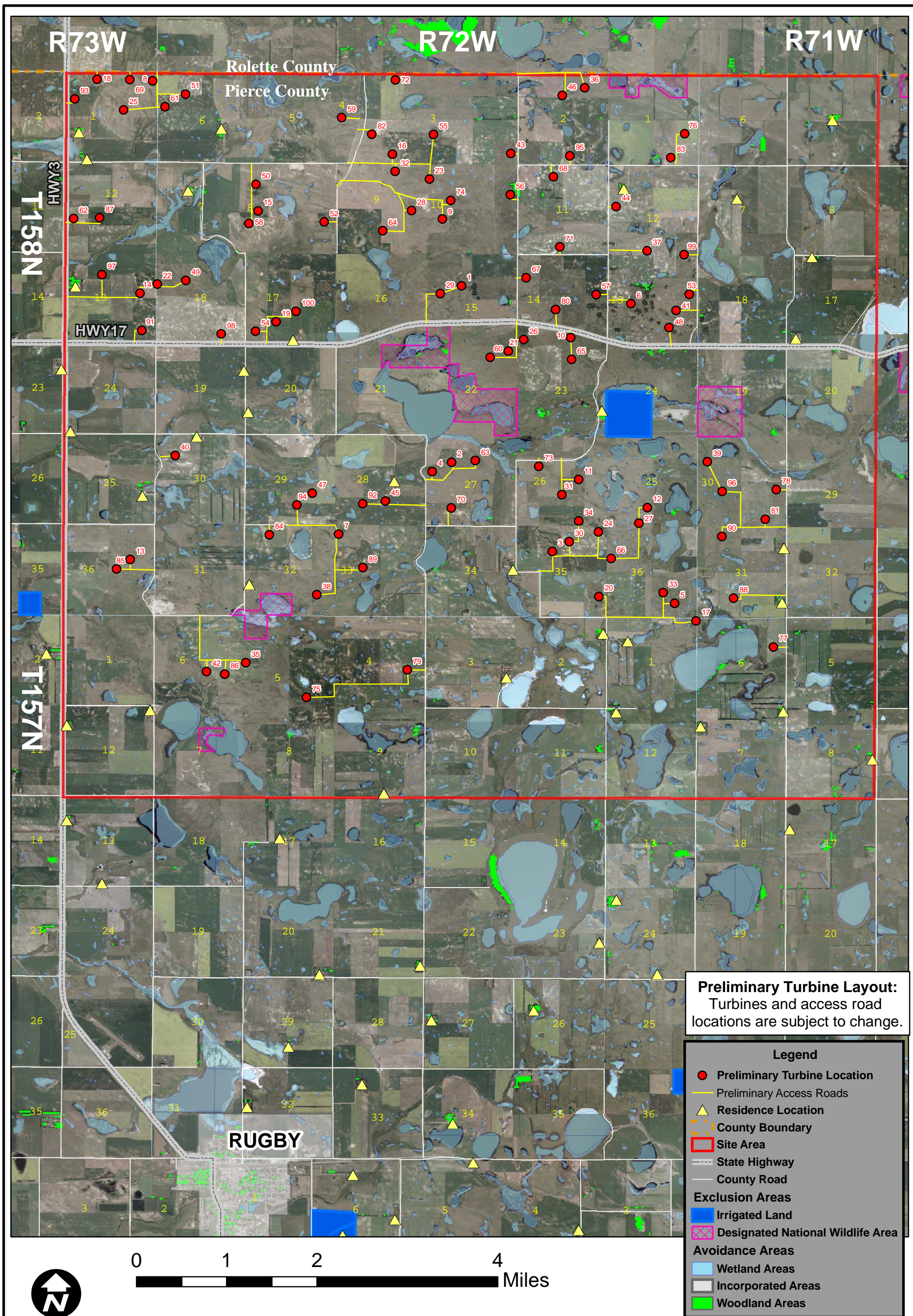
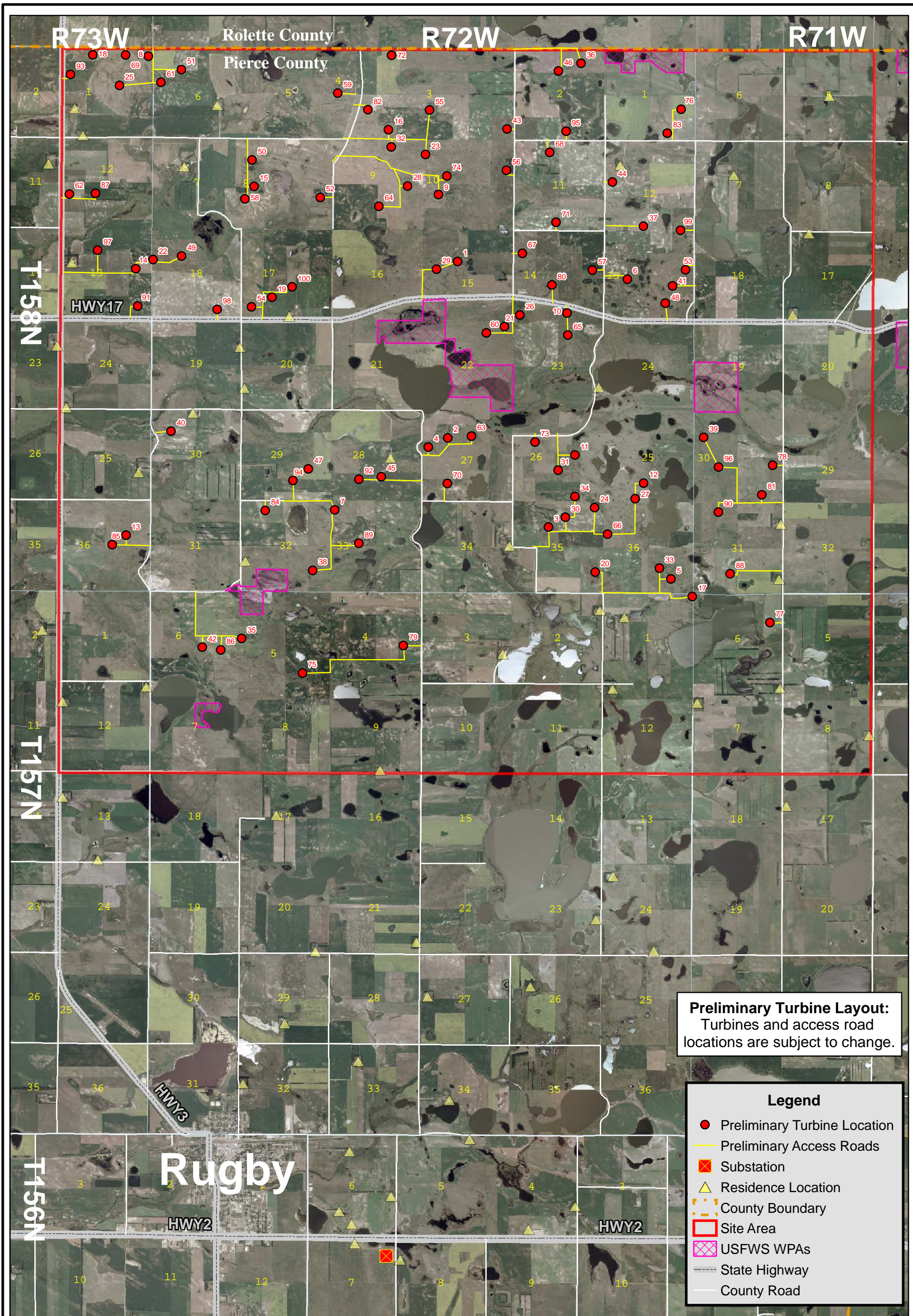


Figure 3. Exclusion and Avoidance Areas
2003 FSA Aerial Photos
Rugby Wind Farm
Pierce County, ND



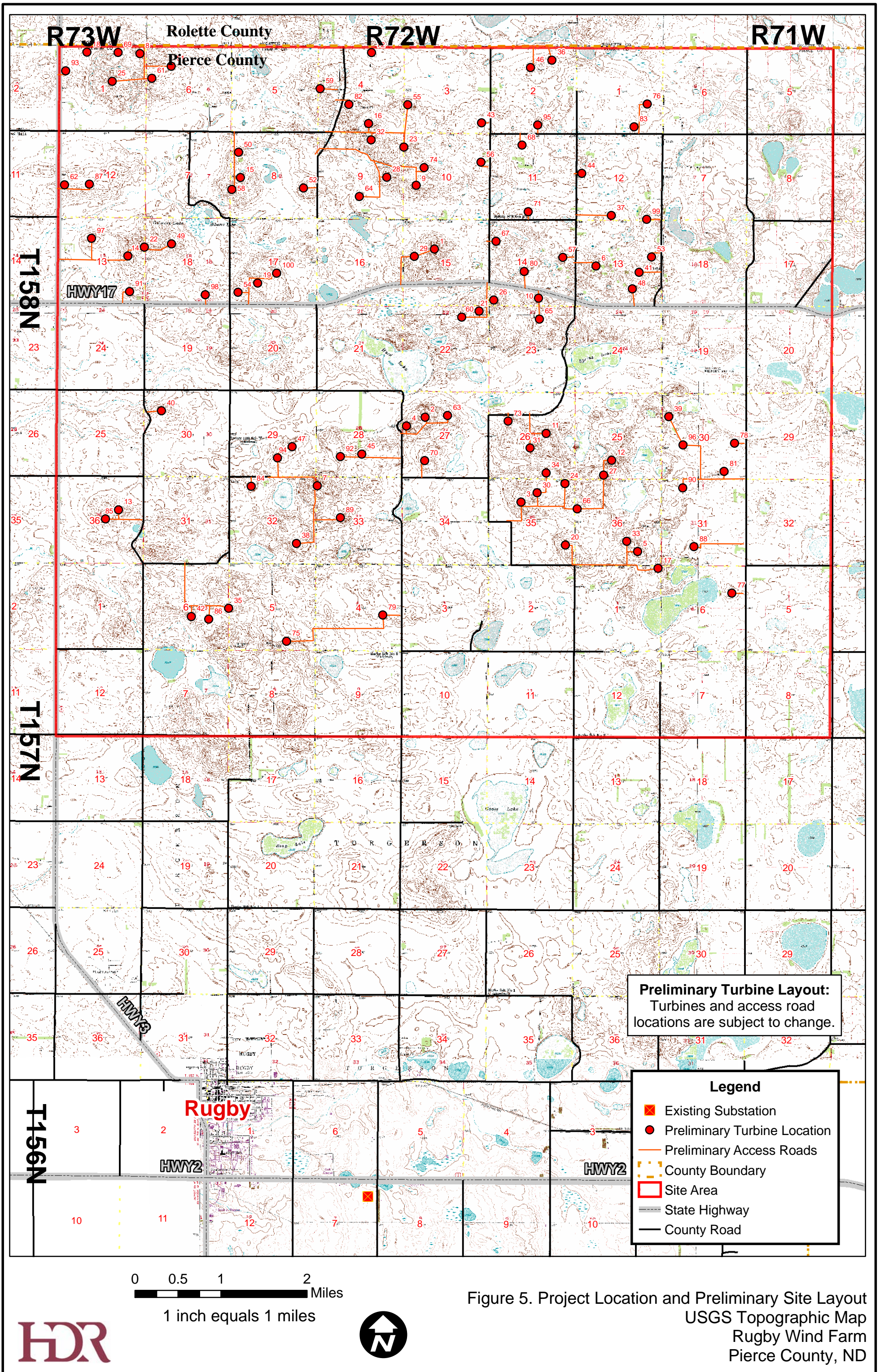
Preliminary Turbine Layout:
 Turbines and access road locations are subject to change.

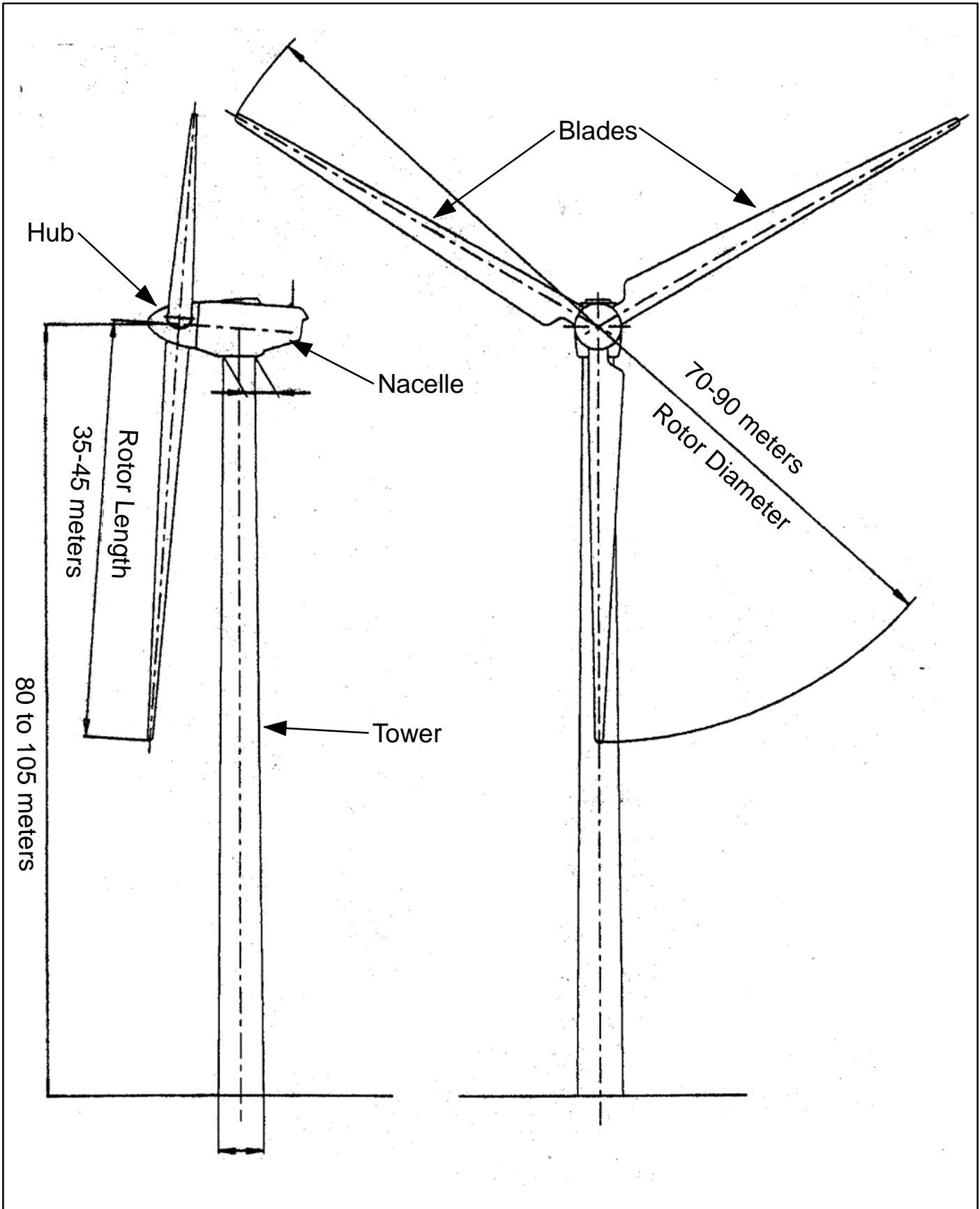
- Legend**
- Preliminary Turbine Location
 - Preliminary Access Roads
 - ⊠ Substation
 - ▲ Residence Location
 - ⊡ County Boundary
 - Site Area
 - ▨ USFWS WPAs
 - State Highway
 - County Road

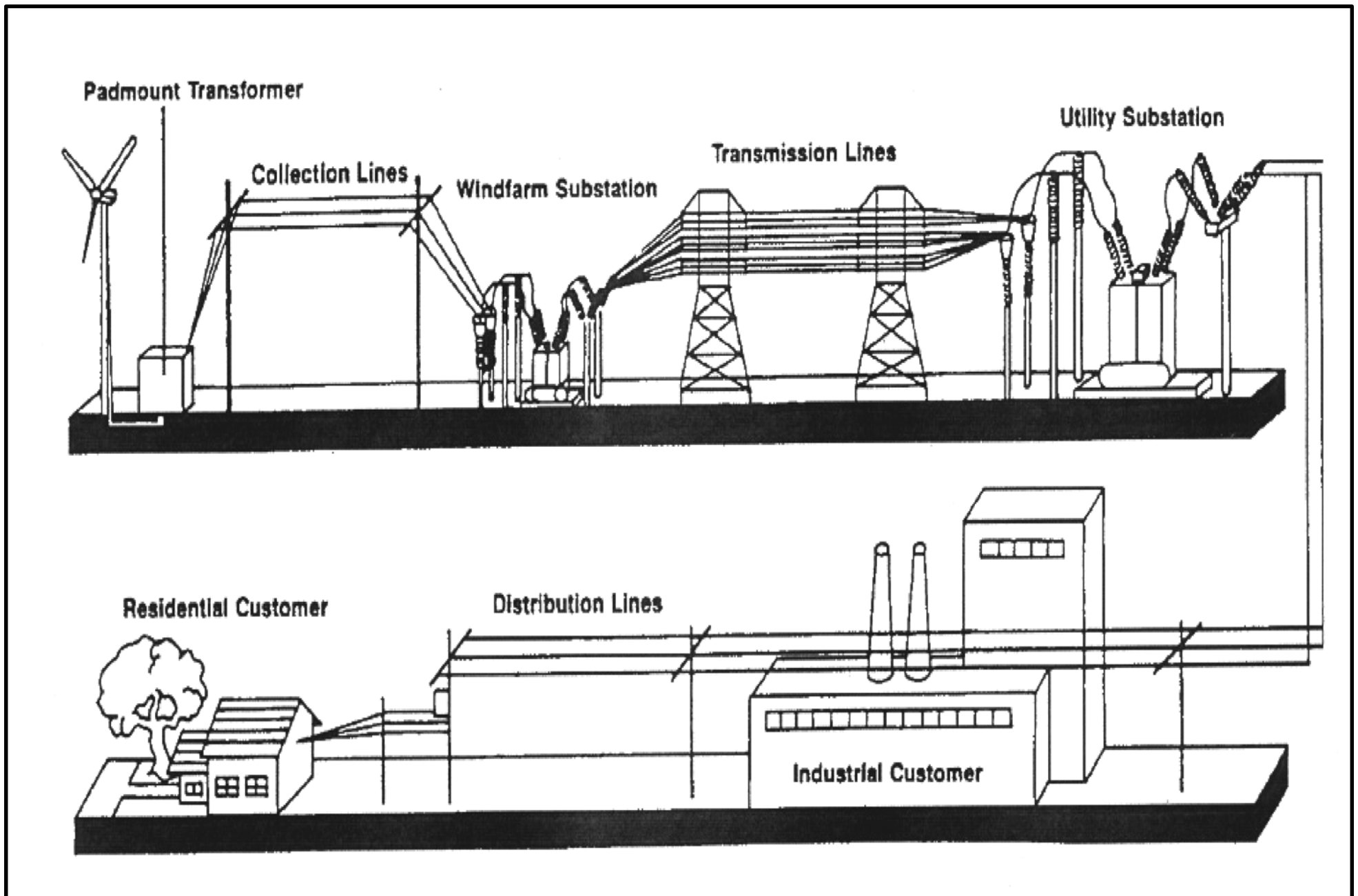
0 0.5 1 2 Miles
 1 inch equals 1 miles



Figure 4. Project Location and Preliminary Site Layout
 2003 FSA Aerial Photos
 Rugby Wind Farm
 Pierce County, ND







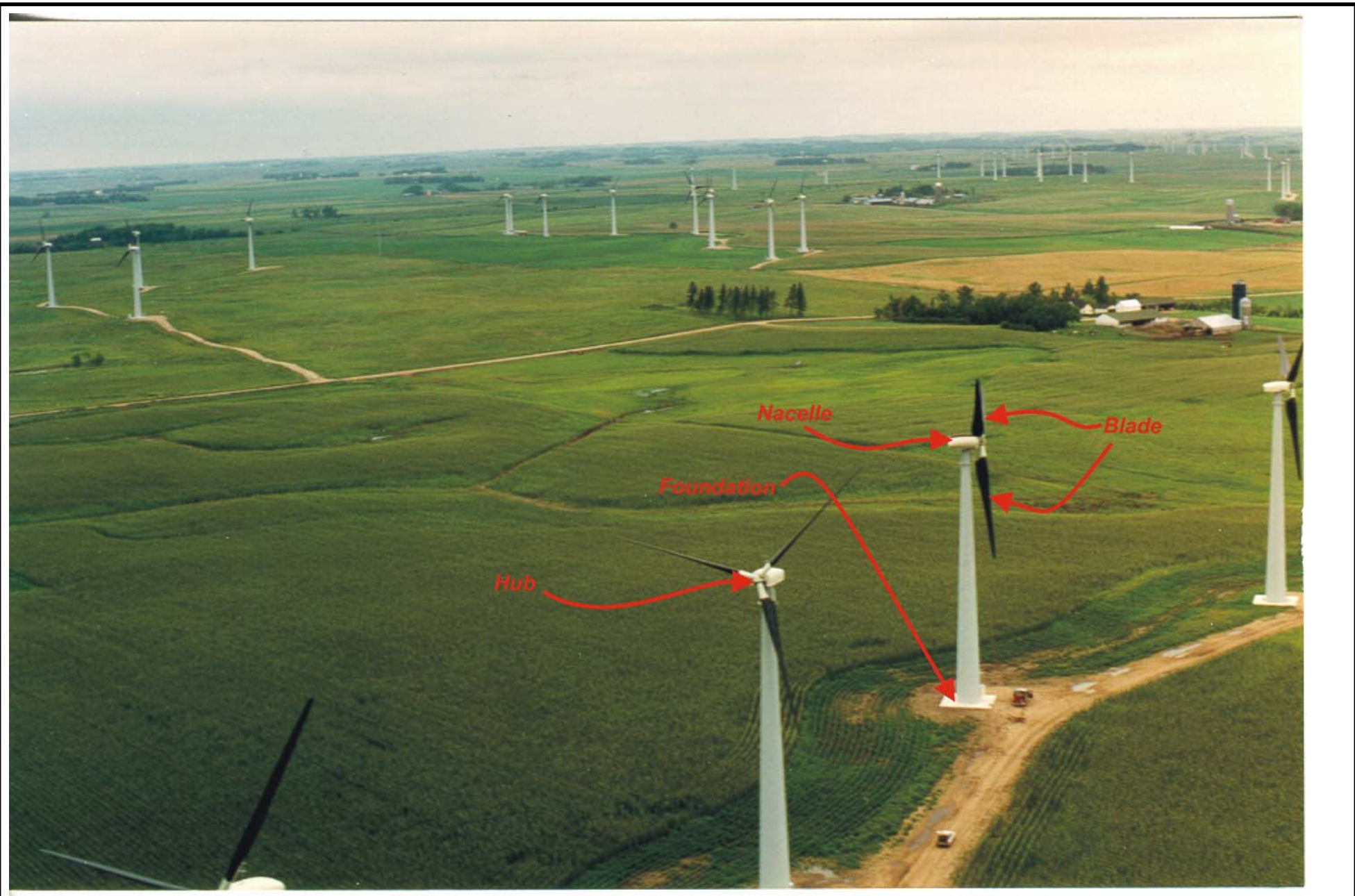
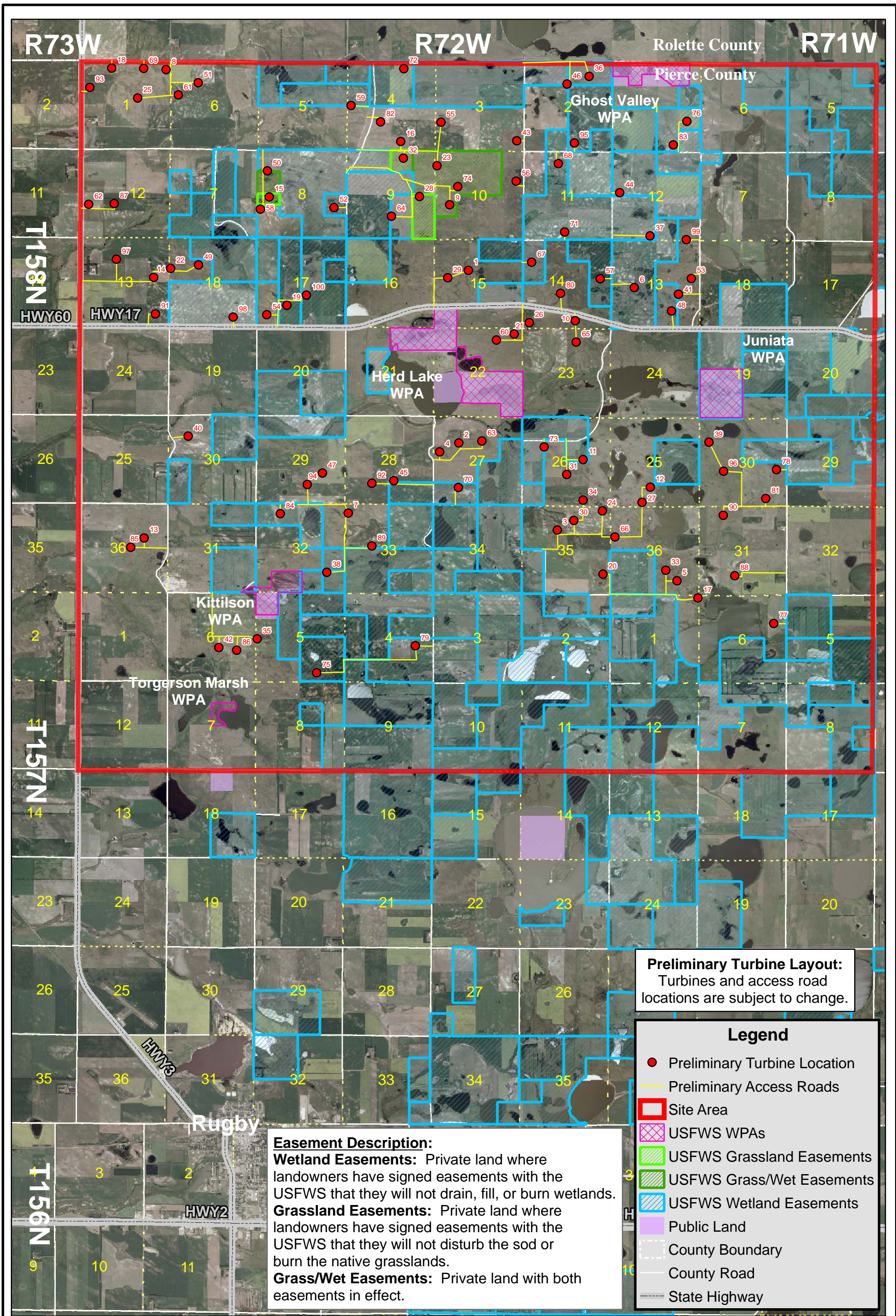


Figure 8. Typical Wind Farm Facility Layout
Rugby Wind Farm
Pierce County, ND



Easement Description:
Wetland Easements: Private land where landowners have signed easements with the USFWS that they will not drain, fill, or burn wetlands.
Grassland Easements: Private land where landowners have signed easements with the USFWS that they will not disturb the sod or burn the native grasslands.
Grass/Wet Easements: Private land with both easements in effect.

Preliminary Turbine Layout:
 Turbines and access road locations are subject to change.

Legend

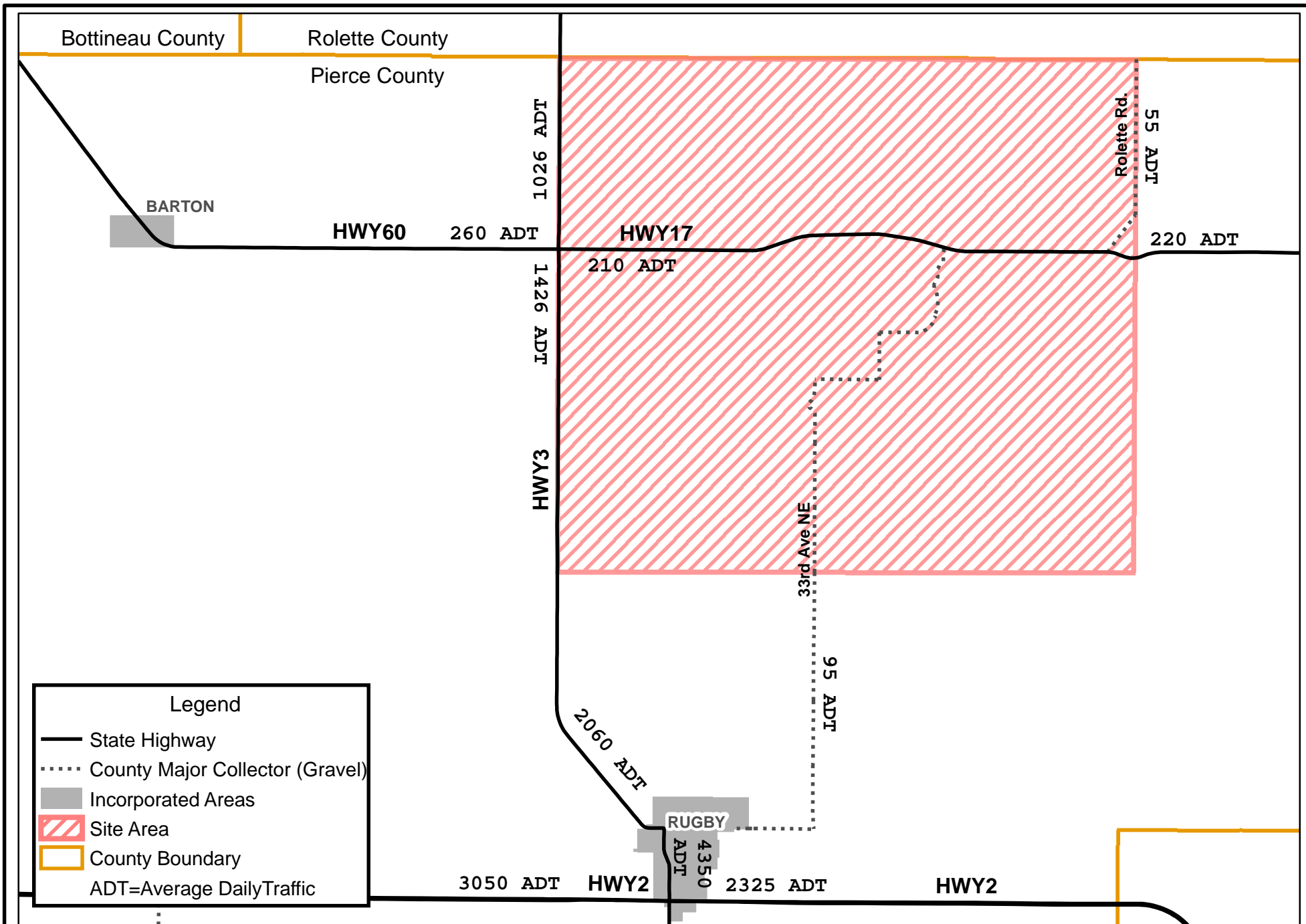
- Preliminary Turbine Location
- Preliminary Access Roads
- Site Area
- ▨ USFWS WPAs
- ▨ USFWS Grassland Easements
- ▨ USFWS Grass/Wet Easements
- ▨ USFWS Wetland Easements
- Public Land
- County Boundary
- County Road
- State Highway

0 0.5 1 2 Miles

1 inch equals 1 miles



Figure 9. Public Lands
 Rugby Wind Farm
 2003 FSA Aerial Photos
 Pierce County, ND



0 0.5 1 2 3 Miles

1 inch equals 2 miles



Figure 10. Average Daily Traffic Map
Rugby Wind Farm
Pierce County, North Dakota

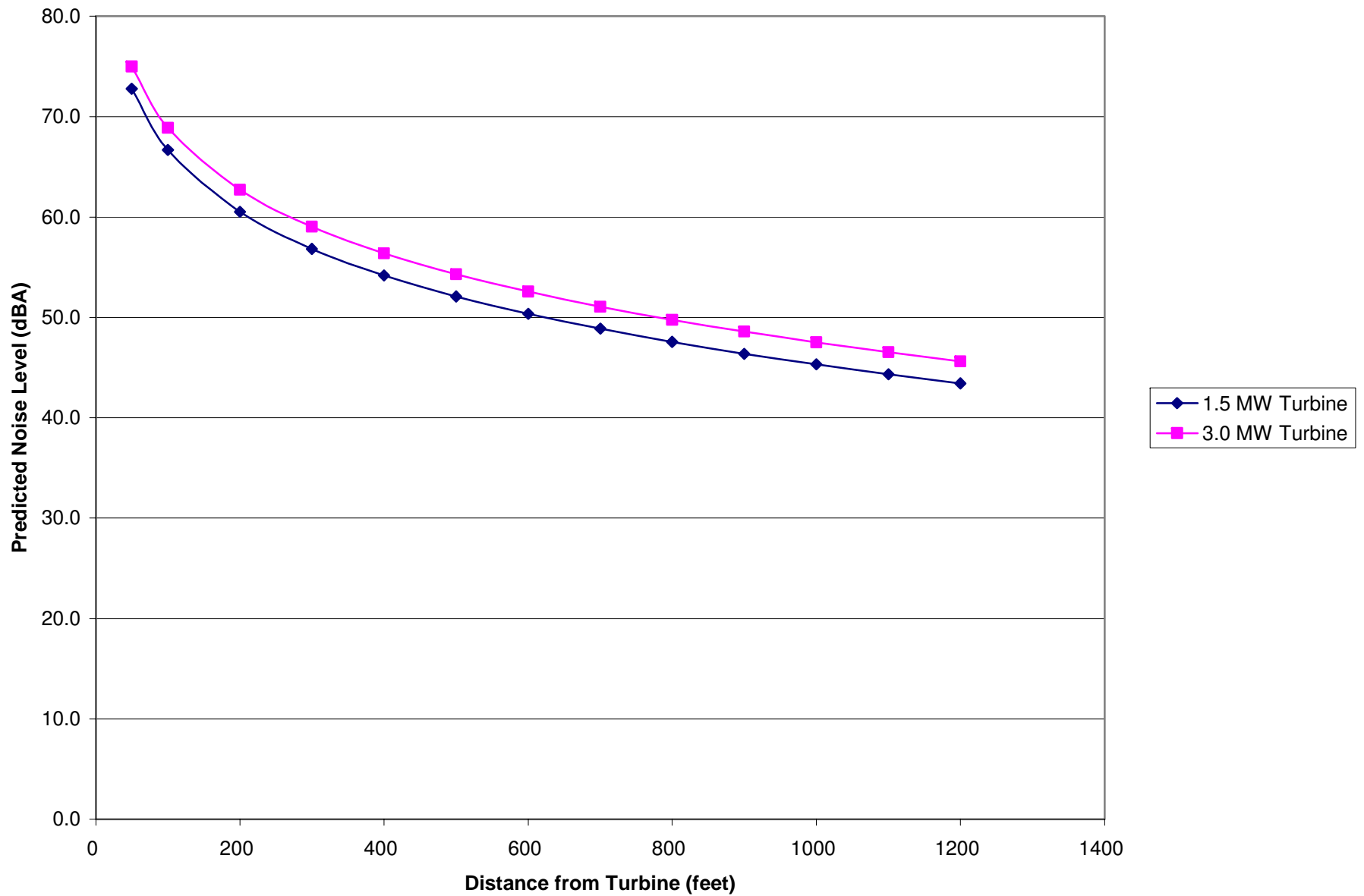


Figure 11. Predicted Noise Levels for 1.5 MW and 3.0 MW Wind Turbines (dBA)
 Rugby Wind Farm
 Pierce County, ND





1.5 MW Turbine Layout Simulation



3.0 MW Turbine Layout Simulation

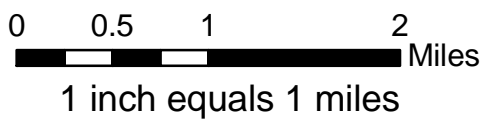
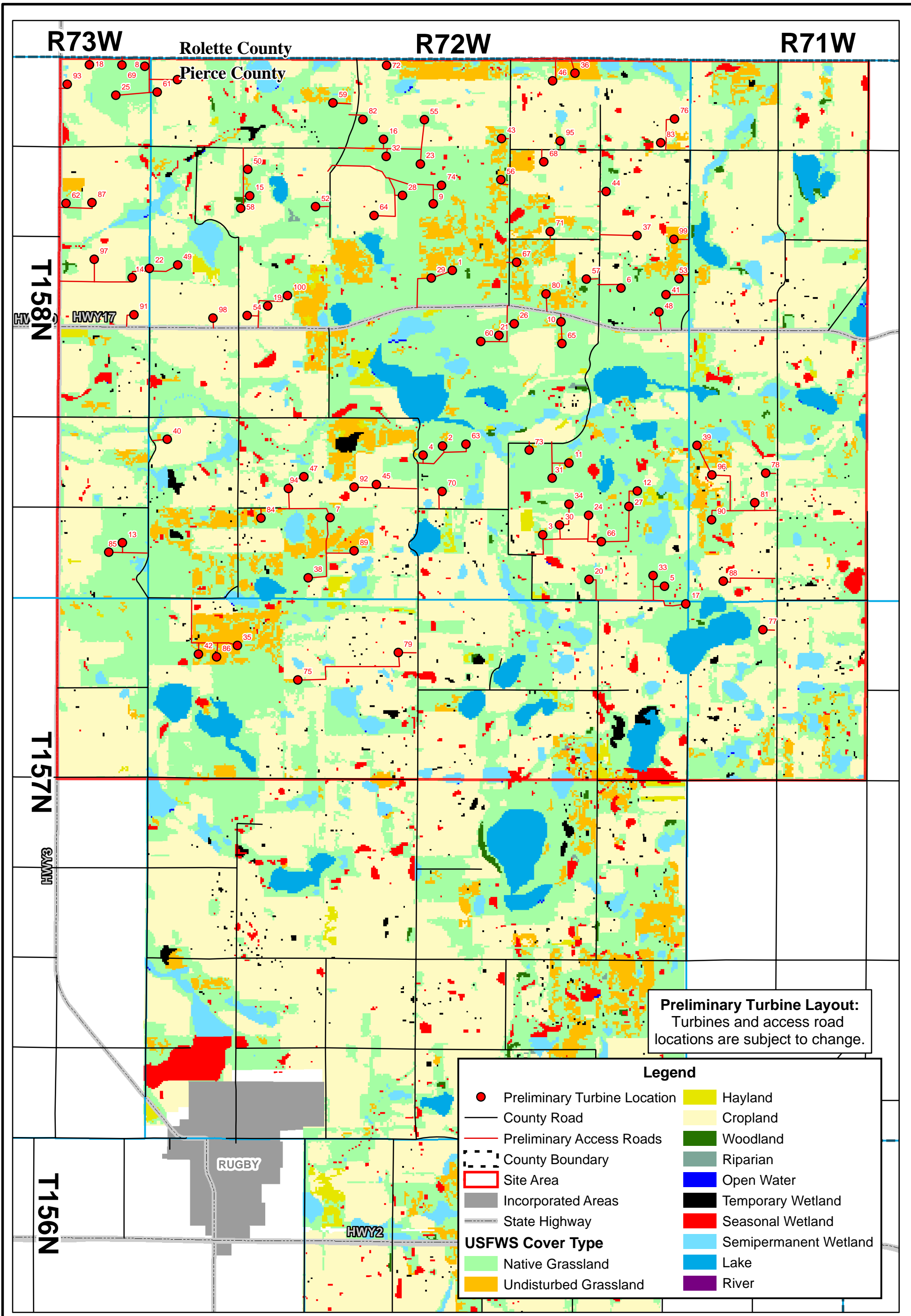
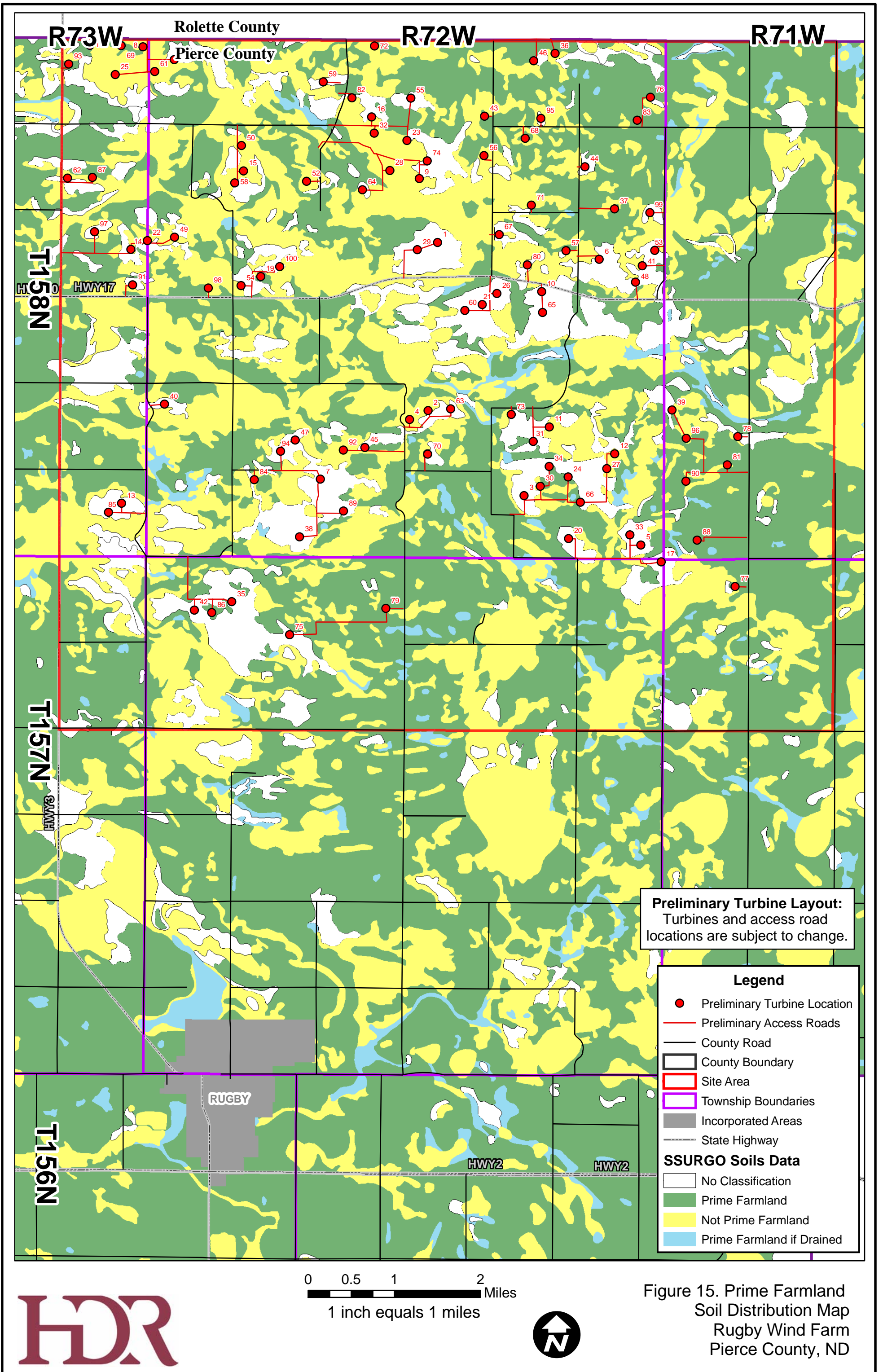


Figure 14. USFWS Land Use Map
Rugby Wind Farm
Pierce County, ND



Preliminary Turbine Layout:
 Turbines and access road locations are subject to change.

Legend

- Preliminary Turbine Location
- Preliminary Access Roads
- County Road
- ▭ County Boundary
- ▭ Site Area
- ▭ Township Boundaries
- ▭ Incorporated Areas
- State Highway

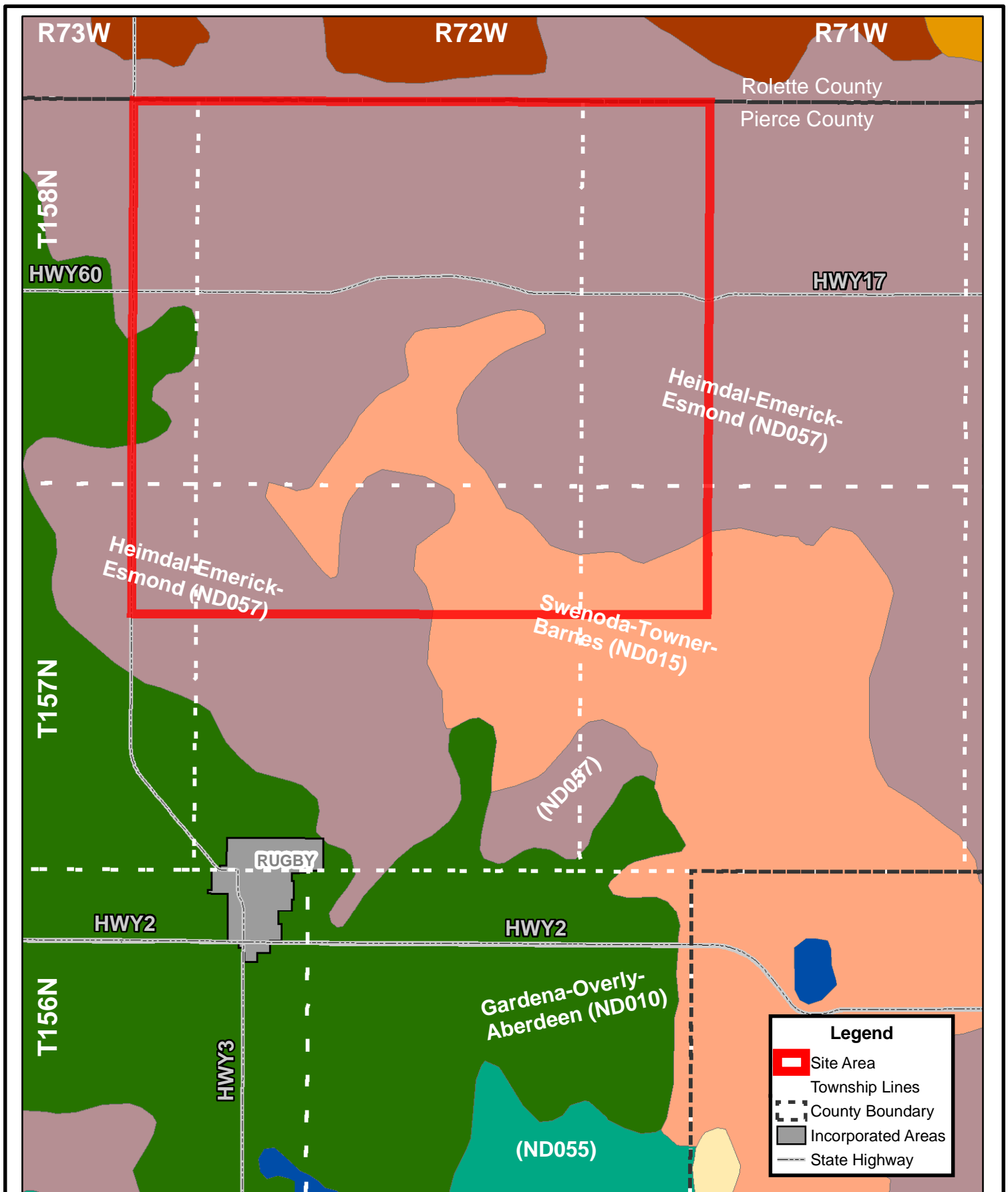
SSURGO Soils Data

- ▭ No Classification
- ▭ Prime Farmland
- ▭ Not Prime Farmland
- ▭ Prime Farmland if Drained

0 0.5 1 2 Miles
 1 inch equals 1 miles



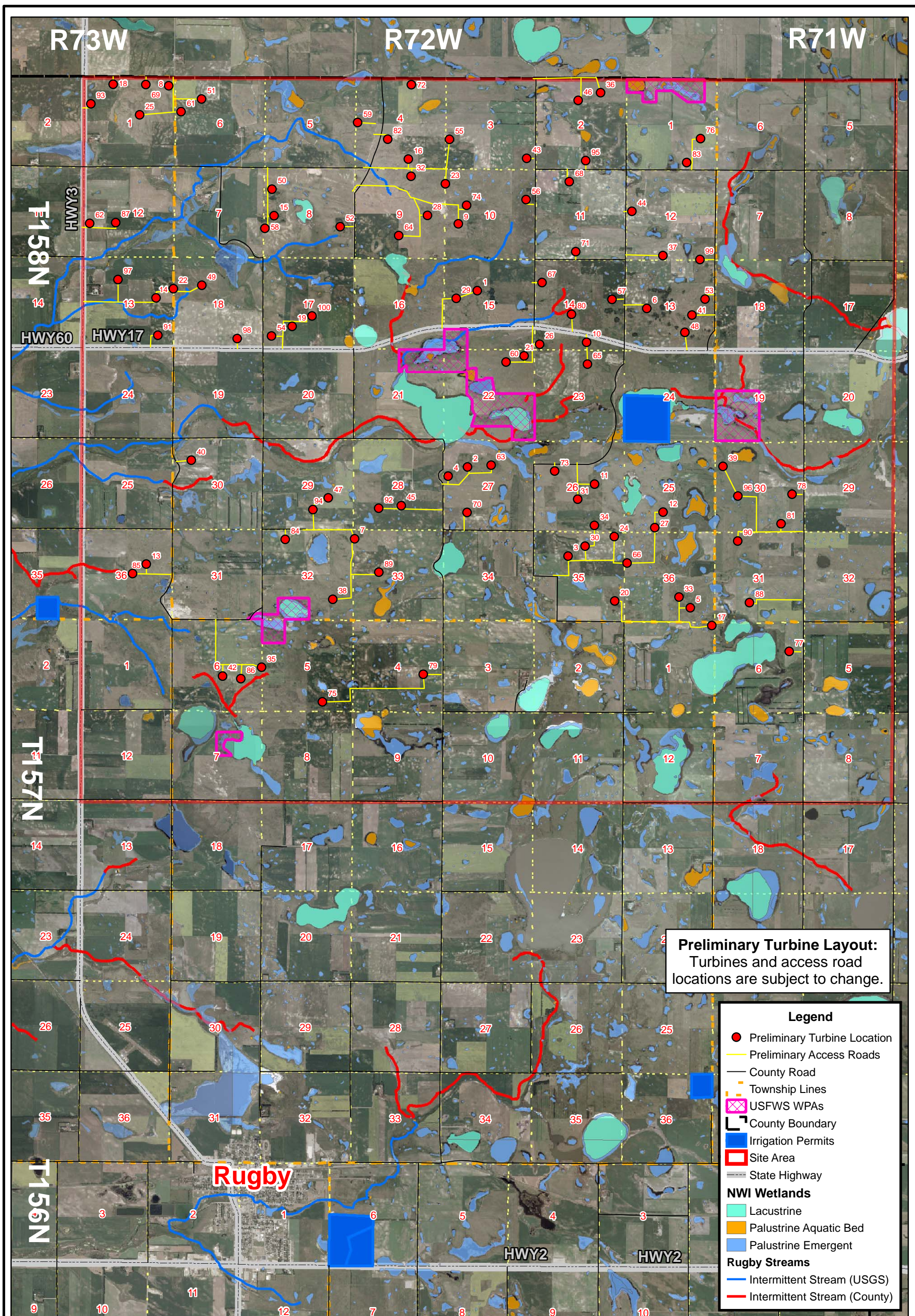
Figure 15. Prime Farmland Soil Distribution Map
 Rugby Wind Farm
 Pierce County, ND



0 0.5 1 2
Miles
1 inch equals 2.0 miles



Figure 16. State Soils Association Map
Rugby Wind Farm
Pierce County, ND



Preliminary Turbine Layout:
Turbines and access road locations are subject to change.

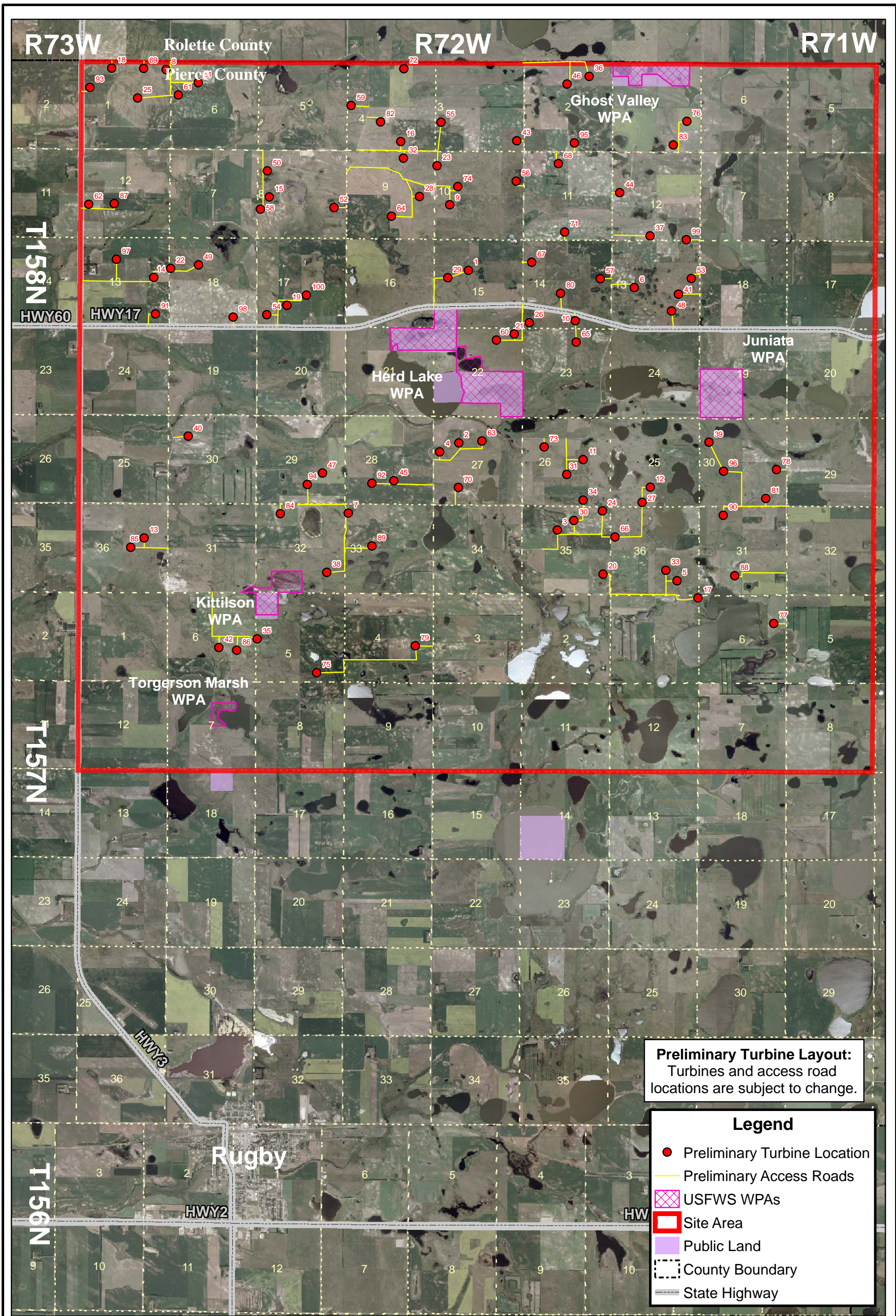
- Legend**
- Preliminary Turbine Location
 - Preliminary Access Roads
 - County Road
 - Township Lines
 - ▨ USFWS WPAs
 - County Boundary
 - Irrigation Permits
 - Site Area
 - State Highway
 - NWI Wetlands**
 - Lacustrine
 - Palustrine Aquatic Bed
 - Palustrine Emergent
 - Rugby Streams**
 - Intermittent Stream (USGS)
 - Intermittent Stream (County)



0 0.5 1 2 Miles
1 inch equals 1 miles



Figure 17. National Wetlands Inventory, Surface Waters and Irrigation Permits Map 2003 FSA Aerial Photos Rugby Wind Farm Pierce County, ND



Preliminary Turbine Layout:
Turbines and access road locations are subject to change.

Legend

- Preliminary Turbine Location
- Preliminary Access Roads
- ▨ USFWS WPAs
- ▭ Site Area
- ▭ Public Land
- - - County Boundary
- State Highway

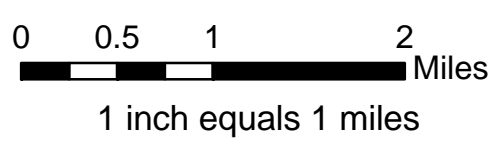


Figure 18. Public Lands Potentially Available for Recreation
2003 FSA Aerial Photos
Rugby Wind Farm
Pierce County, ND



APPENDIX A

PPM Safety and Environmental Policy



“People & the Environment First”

It is PPM Energy’s policy that safety of people and conservation of the environment come first in the conduct of our operations. We are committed to a safe and healthy workplace that promotes a zero accident culture in which no one is harmed in association with our business. We are committed to be an environmentally conscious company that promotes development of clean energy production and storage with minimal adverse environmental effects. Finally, we are committed to continuous improvement to identify and control risks so that our performance meets our high expectations. Therefore, relative to environment, health, and safety, (“EHS”) issues, all organizations and individuals will:

- Operate in compliance with or exceed all EHS governmental laws, regulations, ordinances, standards and permit requirements, and established ScottishPower Group policies and standards;
- Ensure all employees are involved in our EHS programs with appropriate training and communication to work responsibly, make decisions to carry out their duties, and to be accountable for the results;
- Provide a structure that ensures effective EHS management throughout the business with risks, impacts, and legal requirements controlled through appropriate actions and governance;
- Ensure that EHS goals and stretch targets are set, communicated to all employees, and performance monitored to promote continuous improvement;
- Work to proactively prevent incidents, accidents, and environmental damage before these occur by sustainable actions and process improvements at all locations;
- Promote the health and wellness of our employees by identifying and controlling workplace health risks, promoting work-life balance, and encouraging employees and their families to be proactive about their health through communication, activities, and the provision of robust health insurance.
- Require that contractors and others associated with our operations comply with our EHS requirements, and never be asked to perform anything unsafe or in violation of environmental laws;
- Ensure that public safety, security of our people and assets, conservation, and environmental stewardship are fundamental to our operations;
- Design, construct, and operate facilities in ways that minimize their negative EHS impacts, and maximize their positive EHS contribution, as available technology and conditions permit;
- Play a leading role in the development of a renewable energy market through strategic relationships with industry, regulatory bodies, and other external stakeholders, with open communication that maintains their confidence in our commitment to EHS in our operations;

This policy commits the company to its core belief, which is integral to our business philosophy and success, that an excellent environmental, health, and safety culture amongst all employees will deliver superior performance that protects our employees, contractors, the public, and the environment.

Terry Hudgens
President and CEO
August 2004

APPENDIX B

Design Data Report



RUGBY WIND FARM
PIERCE COUNTY, NORTH DAKOTA

DESIGN DATA REPORT

Project

- 150 MW wind farm
- Up to 100 turbines
- Final layout to be completed after micrositing and prior to construction.

Turbine

General Specifications

Turbine Manufacturer	Unknown – use the most appropriate turbine manufacturer once micrositing is complete.
Turbine Hub Height	80-105 meters
Turbine Capacity	1.5 MW – 3 MW
Rotor Diameter	70.5 m – 90 m
Rotor Swept Area	3,904 m ² – 6,362 m ²
Rotor Speed	9.9 rpm – 20.4 rpm
Cut-In Speed	3 m/s – 4 m/s
Cut-Out Speed	25 m/s
Optimum Wind Speed	15 m/s
Maximum Wind Speed	42.5 m/s – 45 m/s
Generator Type	Asynchronous
Control and Regulation	Supervisory Control and Data Acquisitions (SCADA)
Pitch Regulation	Electromechanically driven
Tower	Conical tubular steel
Foundation	40 ft – 60 ft across; 7 ft – 10 ft thick
Lightning Protection	Receptors in rotor blade and tower

Associated Facilities

General Specifications

Electrical	
Power Collection Line Voltage	34,500 Volts (34.5 Kilovolts)
Structure Type	Underground, possibility of overhead 3-phase distribution
Construction Method	Trenching
Design Standards	NESC, PPM
Other	34.5 kV pad mount transformer for each turbine
Substation	
Substation Voltage	230 kV/34.5 kV substation
Approximate Substation Footprint	3 acres
ROW to be acquired (includes operation and maintenance building)	10 acres
Equipment	One 230/34.5 kV transformer, switchgear and control house, circuit breakers, surge arrestors, ring bus
Operations and Maintenance	
Approximate Building Footprint	5,000 ft ²
ROW to be acquired (includes substation)	10 acres
Typical Building Layout	SCADA system, office space, restroom, parts room, bay shop

APPENDIX C

Studies and Assessments

APPENDIX C.1

Summary of Microwave Interference Study

To:	Tim Seck, PPM		
From:	Scott Reed – HDR	Project:	Rugby Wind Project
CC:	Michelle Bissonnette		
Date:	3/14/05	Job No:	9624

RE: Microwave Interference Study for the Rugby Wind Project

HDR Engineering, Inc. (HDR) received authorization from PPM Energy (PPM) to conduct a microwave interference study of the Rugby Wind Project. HDR requested that Comsearch conduct a microwave interference study and calculate the worse case Fresnel Zone on each of the beam paths. HDR had Comsearch calculate the Fresnel Zone based on a proposed 80 m turbine height and maximum 82 m rotor diameter. The site location for the study was identified as:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-10
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-17, 20-29, 32-36
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

Comsearch identified four microwave paths that intersect the project area of interest (Table 1). The Worst Case Fresnel Zone (WCFZ) is approximately 20 meters (approximately 66 feet) wide on either side of the Otter Tail Power Company beam path (WQAB983 to WGX902). Based on the information provided by Comsearch, WQAB983 is located at or immediately adjacent to the Rugby Substation. It is anticipated that a transmission line connection from the proposed Rugby Wind Project would not impact this beam path. The microwave beam paths for Midcontinent Communications and WWC Holding Company cross the southern end of the transmission corridor for the Rugby Wind Project; the WCFZ radius for the WWC beam path is just over 19 meters (approximately 62 feet) and the WCFZ radius for the Midcontinent beam path is just over 15 meters (approximately 49 feet). The microwave beam paths are present in the following sections within the project area:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-8

Comsearch identified 68 land mobile sites that fall within the Rugby Wind Project boundary (Table 2). It is not anticipated that the land mobile sites will be affected by turbine placement. However, it may be prudent to avoid the areas within several hundred feet of the land mobile sites. The land mobile sites are present in the following sections within the project area:

Township Name	Township	Range	Sections
Meyer	156N	72W	3
Torgerson	157N	72W	6, 7, 22, 28, 32, 36
Spring Lake	158N	72W	18, 33
East Barton	158N	73W	24

The attached Comsearch report presents their evaluation of the Rugby Wind Project area of interest which shows potential interference to existing microwave and the location of known registered land mobile telecom systems.

Please let us know if you have any additional questions on this study.

APPENDIX C.2

Microwave Interference Study



Executive Summary – Wind Power GeoPlanner™

Licensed Microwave and Land Mobile Fixed Base Station Search

Comsearch performed an analysis to evaluate the potential effects of the planned Rugby Wind Park, North Dakota project area to existing microwave telecom systems and land mobile telecom systems.

Comsearch's Wind Power GeoPlanner™ provides a graphical representation of the microwave paths and fixed land mobile sites, and provides supporting technical parameters. The microwave path and land mobile data is overlaid on USGS topographic basemaps.

Microwave Search Results. Comsearch identified four (4) microwave paths that intersect the project area or area of interest (AOI) (see Figure 1 and Table 1 below).

Comsearch then calculated Worse Case Fresnel Zones (WCFZ) for each microwave path. The mid-point of a microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones are calculated for each path using the following formula.

$$Rn \cong 17.3 \sqrt{\frac{n}{FGHz} \left(\frac{d1d2}{d1 + d2} \right)}$$

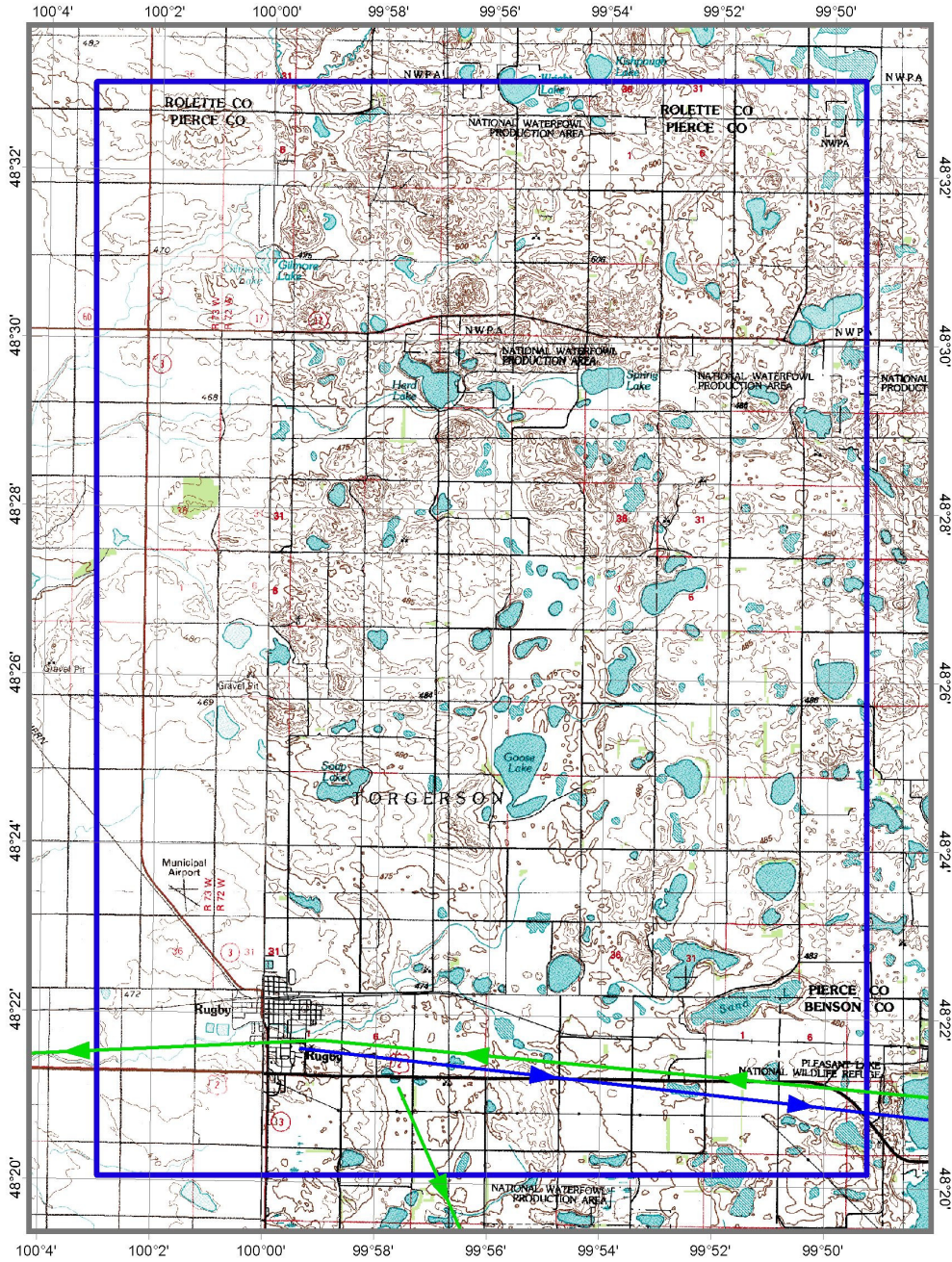
In general, the WCFZ is the XY area or swath where the planned wind turbines should be avoided, if possible. The WCFZ radius in meters is included in Table 1. Figure 2 shows the Worst Case Fresnel Zones for each microwave path.

For this project, latitude and longitude values for turbine locations and the turbine blade radius were not given. If the latitude and longitude values for turbine locations are provided, Comsearch can identify specific microwave telecom paths and turbines where a potential XY conflict exists. Additionally, when wind turbines need to be located inside a WCFZ, Comsearch can provide a detailed interference study, which considers the vertical Z-height clearance objectives.

Land Mobile Search Results. Comsearch identified 68 land mobile sites that fall within the Rugby project boundary (see Figure 3 and Table 2 for a partial listing, and the excel file on the CDROM for a full listing).

Comsearch Contact:

Denise Finney, Account Manager
Phone: (703) 726-5650 Fax: (703) 726-5599
Email: dfinney@comsearch.com

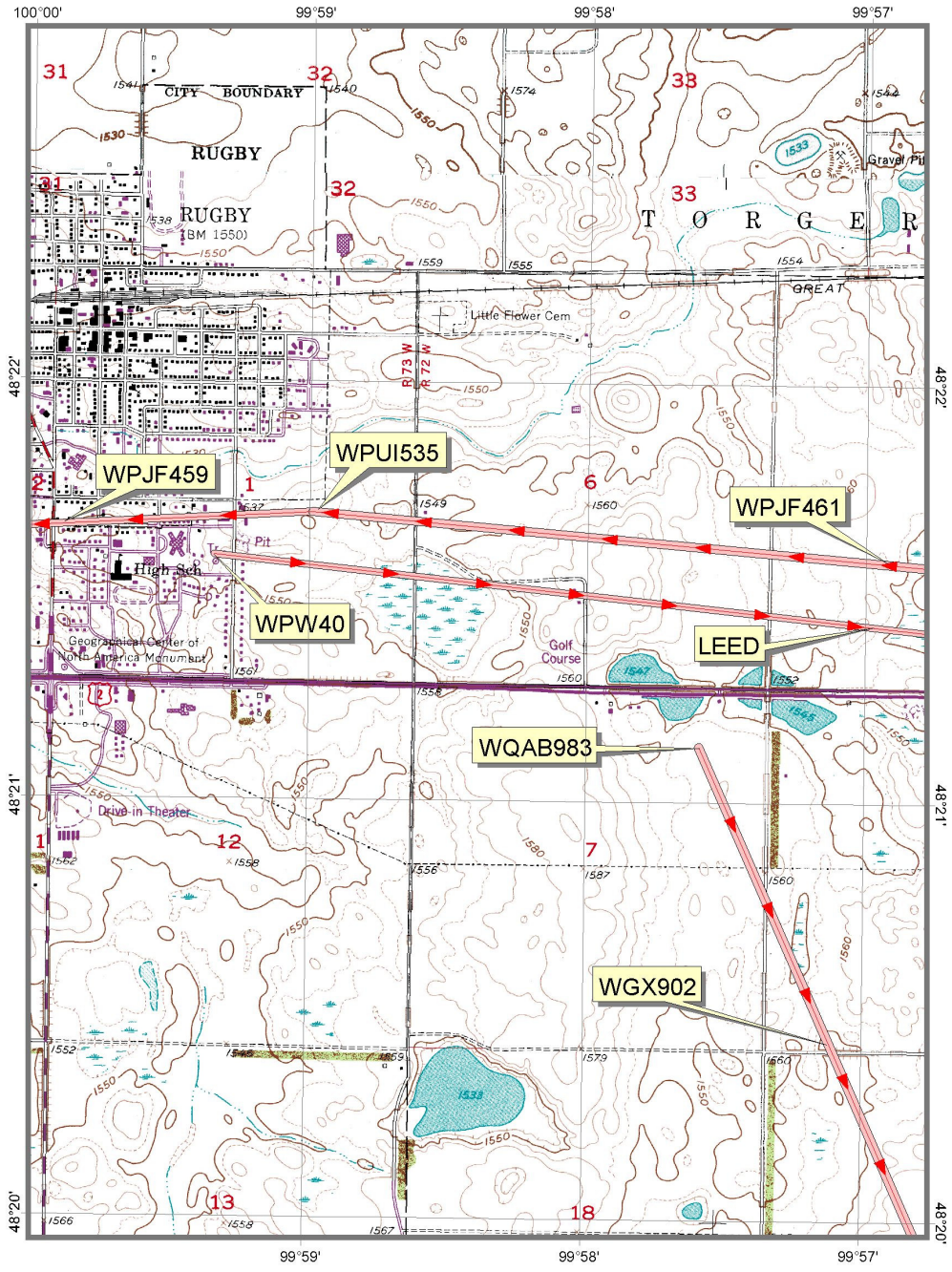


AOI

HDR Inc.
Wind Power GeoPlanner™
Rugby Wind Farm



Figure 1: GeoPlanner™ Project Overview

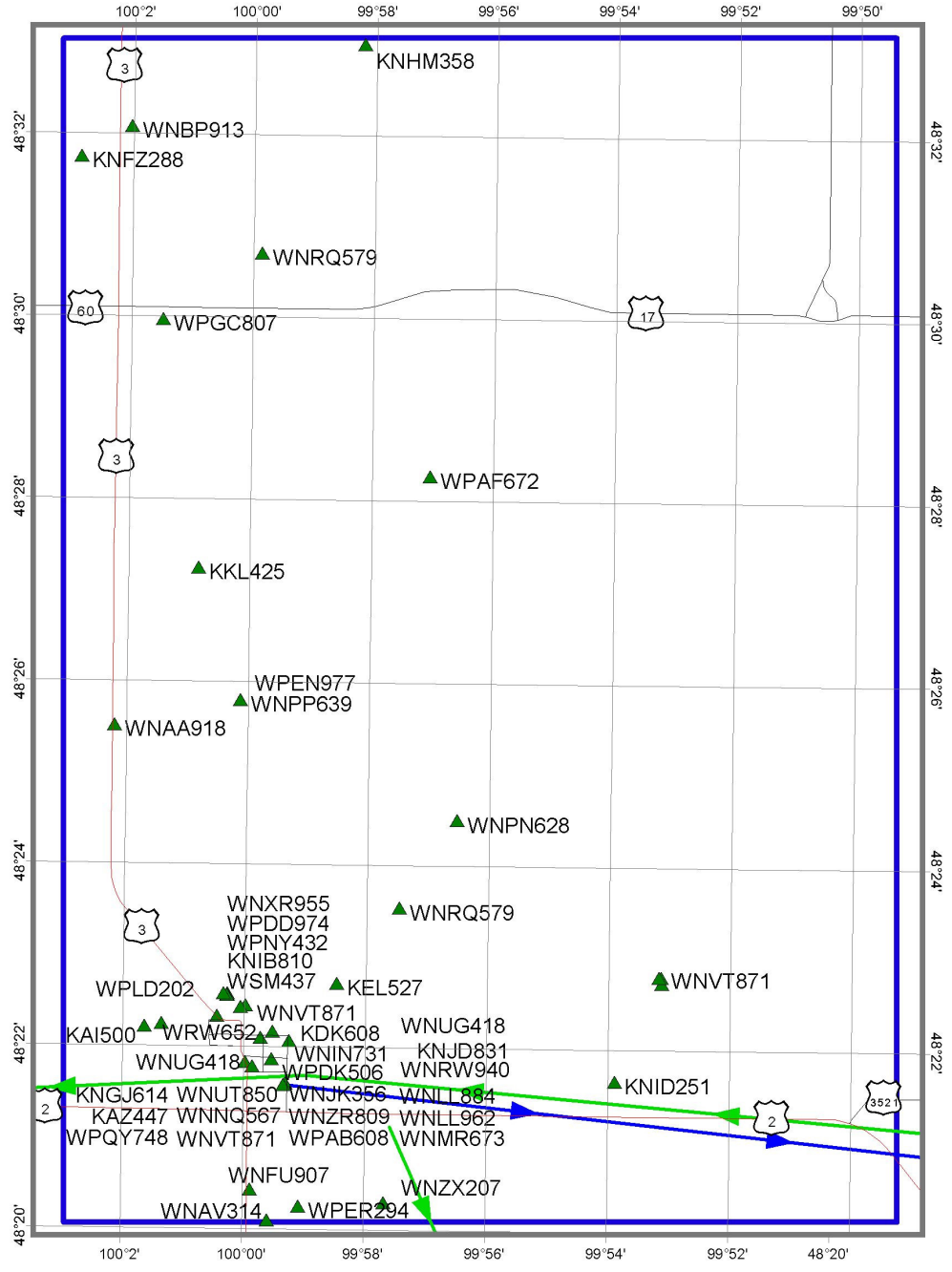


HDR Inc.
Wind Power GeoPlanner™
Rugby Wind Farm

WCFZ
Microwave GeoPlanner



Figure 2: GeoPlanner™ WCFZ



AOI

HDR Inc.
Wind Power GeoPlanner™
Rugby Wind Farm

Land Mobile Site



Figure 3: Land Mobile Sites



Name Site 1	Name Site 2	Call Sign Site 1	Call Sign Site 2	Band Name	Company Site 1	Company Site 2	WCFZ (m)
KNOX	RUGBY DT	WPJF461	WPUI535	Upper 6 GHz	WWC Holding Co., Inc	WWC Holding Co., Inc	19.02
RUGBY	ESMOND	WQAB983	WGX902	Upper 6 GHz	OTTER TAIL POWER COMPANY	OTTER TAIL POWER COMPANY	20.09
RUGBY	LEEDS	WPW40	LEED	13 GHz	Midcontinent Communications	Midcontinent Communications	15.23
RUGBY DT	BERWICK	WPUI535	WPJF459	Upper 6 GHz	WWC Holding Co., Inc	WWC Holding Co., Inc	15.59

Table 1: Microwave GeoPlanner™ Links within Project Area

Call Sign	Latitude	Longitude	Location	City, State	Licensee
WPQY748	48.3631	-99.9976	800 MAIN AVE S	RUGBY, ND	GOOD SAMARITAN HOSPITAL ASSOCIATION
WRW652	48.3722	-100.0074	1/8 MI N ON HWY 3	RUGBY, ND	DEPLAZES, ANTHONY
WSM437	48.3764	-100.0046	.4 KM W OF JCT HWY 2 & 3	RUGBY, ND	FERRELLGAS LP
KAI500	48.3703	-100.0274	TELEGRAPH OFF 2ND AVE N & 2ND ST W	RUGBY, ND	BNSF Railway Company
KAZ447	48.3644	-99.9924	RUGBY HIGH SCHOOL MAIN AVE & 12TH ST	RUGBY, ND	RUGBY PUBLIC SCHOOL DIST 5
KDK608	48.3694	-99.9921	1/2 MI W HWY 3 HWY 2	RUGBY, ND	RON FOSSUM DIST INC
KEL527	48.3783	-99.9746	2 MI E & 2 MI N OF	RUGBY, ND	PIERCE COUNTY
KKL425	48.4542	-100.0140	RT 2 BOX 53 4 MI N	RUGBY, ND	BROSSART, VALENTINE F
KNGJ614	48.3639	-99.9996	COUNTY COURT HOUSE 311 3RD ST SE	RUGBY, ND	PIERCE, COUNTY OF
KNHM358	48.5500	-99.9699	6 MI W 8 1/2 MI S	ROLETTE, ND	HAMAN, CLEMENCE
KNIB810	48.3764	-100.0046	105 4TH AVE SW	RUGBY, ND	FARMERS UNION OIL COMPANY
KNID251	48.3608	-99.8982	5 MI E .5 MI N .25 MI W	RUGBY, ND	JOHNSON, SCOTT L
KNJD831	48.3631	-99.9976	800 MAIN AVE S	RUGBY, ND	GOOD SAMARITAN HOSPITAL ASSOCIATION DBA HEART OF AMERICA MEDICAL CENTER
...	...				

Table 2: Land Mobile Sites (Partial listing, see CDROM for complete list)

APPENDIX C.3

Phase One Screening Report and USFWS PII Score

Phase One Screening Report and USFWS PII Score

**PPM Energy Site
Rugby, North Dakota**

April 1, 2005

Prepared for:

**HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518**

and

**PPM Energy, Inc.
1125 NW Couch, Suite 700
Portland, OR 97209**

Prepared by:

**Clayton Derby
Western EcoSystems Technology, Inc.
2003 Central Avenue
Cheyenne, Wyoming 82001**

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I. INTRODUCTION

I.A. Purpose

When exploring prospective wind farm sites, knowledge of wildlife and other biological resource issues helps the wind industry and agencies identify and avoid potential ecological problems early in the development process. Additionally, this information is useful in addressing natural resource concerns raised by state and federal natural resource agencies as well as other project stakeholders (e.g., local residents, private organizations). Western EcoSystems Technology, Inc. (WEST) was contracted to conduct biological investigations of the Rugby Wind Farm proposed for construction by PPM Energy, Inc. (PPM) in Pierce County, North Dakota (Figure 1). The purpose of this report is to investigate general biological issues associated with wind farm development at the proposed site so that major issues can be identified. This investigation generally follows the site evaluation process described in the document “Studying wind energy/bird interactions: a guidance document” (Anderson et al. 1999) and the U.S. Fish and Wildlife Service’s “Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines” (USFWS 2003). To evaluate the site at this level, the investigation relies heavily on existing local, regional, and national research efforts, input from agencies, and other literature, and does not include a large pre-construction baseline study effort. A reconnaissance-level site visit was conducted to evaluate major land features (e.g., topography, ridge aspect, water bodies, etc.) and habitats in the project areas. This report presents the observations made during the site visit, describes agency consultations, discusses the results of a literature review in order to assess the potential impacts of the proposed wind farms on state and/or federally protected or sensitive species of concern, and presents the Potential Impact Index (PII) score associated with the USFWS Interim Guidelines.

This report focuses on the proposed wind farm site and the following potential areas of concern:

- Raptors
- Federal Species of Concern
- State Wildlife Issues
- Unique Habitats
- Wetlands
- Bats
- Avian Migratory Pathways

I.B. Project Description

The proposed Rugby Wind Farm project area is located between 4-11 miles north of Rugby, North Dakota (Figure 1). The elevation of the project area ranges from approximately 1,500-1,700 feet (ft). Mixed-grass prairie with livestock grazing and cultivated agriculture are the dominant vegetation types and land uses in the wind farm area. There are scattered patches of deciduous trees and shrubs around some of the lakes and ravines and planted tree rows and shelter belts in cultivated fields and near residences. Numerous waterbodies and wetlands of varying size are located throughout the project area. There is not a consistent ridgeline or other similar feature through the project area, rather the area is composed of numerous small hills and low areas (Figure 2).

Most lands in the project area are privately owned. Portions of these private lands have easements held by the USFWS. There are five Waterfowl Production Areas (WPA) owned by the USFWS within, partially within, the overall boundary of the project area: Torgerson Marsh in the SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 7 T157N R72W, Herd Lake in the N $\frac{1}{2}$ of NE $\frac{1}{4}$ of Sec. 21 and majority of Sec. 22 T158N R72W, Juanita in the SW $\frac{1}{4}$ of Sec. 19 T158N R71W, Kittilson in parts of Sec. 5 T157N R72W and Sec. 30 and 31 T158N R72W, and Ghost Valley in Sec. 1 T158N R72W (Figure 2). After completion of the site visit on November 22, 2004 the project area was extended three miles further north (*i.e.*, from the north boundary being Highway 17 to the north boundary being three miles north of Highway 17) and one mile west (*i.e.*, new boundary is Highway 3). This area was not physically surveyed, however based on a review of topographic maps and aerial photos it appears to contain the same general features as the original project boundary, with the exception of fewer wetlands and larger waterbodies, and less overall topographic relief.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of approximately 150 MW. The most likely turbine size is 1.5 MW with a rotor diameter of 82 meters (269 ft). The wind turbines will be situated on 80-meter-tall (262 ft) steel, tubular towers secured to a concrete foundation. Details on turbine layout have not been developed at this time.

II. METHODS

II.A. Agency Consultations

Letters requesting information and comments relating to biological issues (including occurrence of federally listed and candidate species, state listed species, and state rare species in the vicinity of the proposed wind farm development site) were sent to the U.S. Fish and Wildlife Service (USFWS), the North Dakota Game and Fish Department (NDGFD), and the North Dakota Parks and Recreation Department (NDPRD) (for Natural Heritage Inventory review) by HDR Engineering, Inc (see Appendix A). The NDPRD replied on December 14, 2004, the NDGFD replied on January 14, and the USFWS replied on January 10, 2005 (Appendix B). In addition to these correspondences, representatives from WEST, and/or HDR have had several phone conversations, in-person discussions, and site visits/meetings with personnel from both agencies.

II.A. Phase I Screening and USFWS PII

Biological resources in the vicinity of the proposed wind farm area were evaluated by reviewing existing data and visiting the site area. A site visit was conducted on November 17, 2004 and included environmental staff from HDR and the Wetland District Manager from J. Clark Salyer NWR Complex. A second site visit occurred on November 22, 2004 and included a biologist from the NDGFD and a biologist from WEST. During the first site visit the group discussed the project relative to FWS easements and fee title interests. During the second visit, biological features and potential wildlife habitat, including plant communities, topographic features, and potential raptor nest structures, were identified. A list of wildlife species observed during the site visit was recorded (Table 1).

Table 1. A list of species observed during the November 22, 2004 site visit within the project area.

COMMON NAME	SCIENTIFIC NAME
Various and numerous waterfowl species	
Black-billed magpie	<i>Pica pica</i>
Blue jay	<i>Cyanocitta cristata</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>
Hairy Woodpecker	<i>Dendrocopos villosus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Common Raven	<i>Corvus corax</i>
Unidentified/mixed sparrow flocks	
Fox squirrel	<i>Sciurus niger</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Longtail weasel	<i>Mustela frenata</i>

Several data sources were used to identify biological resources within the project area, including data requested from the North Dakota Natural Heritage Inventory, review of websites, discussions with USFWS and NDGFD personnel, and published literature, field guides, etc. After biological resources in the project area were identified, potential for conflicts with the proposed Rugby Wind Farm area were analyzed based, in part, upon studies conducted at other wind plants throughout the U.S. The Potential Impact Index (PII) score based on the Interim USFWS Guidelines (USFWS 2003) was also developed for the proposed wind farm area.

III. RESULTS

III.A. Phase I Screening

III.A.1 Raptors

Nesting density and species breeding. Potential nesting habitats in the project area for above-ground nesting raptor species are present in the form of scattered trees, tree rows, and shelter belts. No cliffs or rock outcrops were identified during the site visit. Based on the reconnaissance-level site visit, it did not appear that the proposed project area supports high densities of above-ground nesting raptors, but extensive searches were not completed. One large raptor stick nest was located in a large cottonwood tree in T157N R72W Sec. 1. One bald eagle was observed perched in the same tree and another sitting on the nest at the time of the site visit. It is possible that this is an active bald eagle nest but because of the site visit date, nest occupancy and/or species use could not be confirmed.

Above-ground nesting species most likely to nest within and surrounding the project area include, Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), and red-tailed hawk (*Buteo jamaicensis*). It is also possible that ferruginous hawk (*Buteo regalis*), Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), bald eagle (*Haliaeetus leucocephalus*), screech owl (*Otus asio*), and great-horned owl (*Bubo virginianus*) could nest in the project area (Stewart 1975). Ground- or belowground-nesting raptors most

likely nesting in the project area includes northern harrier (*Circus cyaneus*). Other potential ground- or belowground-nesting raptors that could be in the project area include burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), and long-eared owl (*Asio otus*), (Stewart 1975). Turkey vulture (*Cathartes aura*) may occur in the project area during the breeding season but are unlikely to nest within the project area due to lack of habitat.

Raptors that may also occur in the project area during the non-breeding season include those listed above, plus rough-legged hawk (*Buteo lagopus*), goshawk (*Accipiter gentiles*), and snowy owl (*Nyctea scandiaca*) (Stewart 1975).

Potential for prey densities. No signs of colonial rodents (e.g. prairie dogs) were observed during the site visit and none are known to be in the project area. Potential raptor prey sources include isolated ground squirrels and other rodents, rabbits, and waterfowl. Waterfowl are known to concentrate in the area during certain times of the year. Overall, it is very difficult to assess potential prey densities during a single site visit and prey densities can fluctuate rapidly based on habitat and climatic factors. However, overall prey densities are not expected to be significantly different than areas outside of the proposed project area.

Does the topography of the site increase the potential for raptor use? The proposed project is located in an area dominated by rolling hills separated by drainages and waterbodies. The area west of the project area is significantly flatter and somewhat lower in elevation. There are no consistent, prominent ridges running through the project area. At some wind farm sites located on prominent ridges with defined edges (e.g., rims of canyons, steep slopes), raptors are often observed flying along the rim edges, using updrafts to maintain altitude while hunting, migrating, or soaring. For example, at a wind farm site in Wyoming, raptors most often used areas within 50 m of the rim edge (Johnson et al. 2000a). Overall, raptor use is not expected to be heavily influenced by the topography in the project area because of the general lack of defined ridges and rim edges. Raptor use may be related to certain waterbodies if they consistently stage more waterfowl and/or have fish populations that could serve as prey.

Many developed wind farms have documented some level of raptor fatalities. Erickson et al. (2001) reported that raptor fatalities averaged 0.033 raptors/turbine/year for nine project areas reviewed. This estimate is reduced to 0.006 raptors/turbine/year if projects in California are removed. A study conducted at the Buffalo Ridge wind farm in southwestern Minnesota (primarily agricultural lands with grasslands/CRP and wetlands) documented one raptor fatality, a red-tailed hawk, during four years of searching 354 turbines (Johnson et al. 2002). Based on the general lack of potential above-ground nesting areas, relatively low potential for concentrated prey items during most periods of the year, and the lack of a defined ridge or other topographic feature in the project area, overall direct impacts to raptors are likely to be similar to the range of 0.006 to 0.033 raptors/turbine/year reported by Erickson et al. (2001).

III.A.2. Federal Species of Concern

In their January 10, 2005 letter the USFWS identified three threatened or endangered species as potentially occur in the project area: whooping crane (*Grus americana*), bald eagle, and piping plover (*Charadrius melodus*) (USFWS letter, Appendix B). The USFWS also identified that piping plover critical habitat has been designated near the project area. In addition to these

threatened and endangered species and critical habitat, the USFWS expressed concern regarding migratory birds, USFWS property interests in the project area, and wetland, grassland, and woodland resources (USFWS letter, Appendix B).

Whooping Crane (Endangered). The whooping crane is an endangered bird with a total population of over 200 birds as of August 2004 (Wally Jobman, USFWS, pers. comm.). Whooping cranes typically migrate from their breeding grounds in Wood Buffalo National Park, Canada to their wintering areas in Aransas National Wildlife Refuge, Texas, although one young adult summered in North Dakota in 1989, 1990, 1993. During the migration, most birds pass through central and western North Dakota, demonstrating a possible correlation between whooping crane stopover sites in North Dakota and the path of the Missouri River (Austin and Richert 2001). There were 289 confirmed observations of whooping cranes in North Dakota between 1943 and 1999, with most occurring along the Missouri River valley. However, there have been confirmed observations of whooping cranes through numerous other counties of North Dakota, including Pierce County (Austin and Richert 2001). The North Dakota Natural Heritage Inventory review (NDPRD letter, Appendix B) did not contain any records of whooping crane occurring within the project area.

Outside of Nebraska, more than 75% of recorded roost observations of whooping cranes from 1943-1999 have been in palustrine wetlands (Austin and Richert 2001). Typically, whooping cranes roost or loaf in shallow water vegetated wetlands and forage in subirrigated wet meadows and/or cultivated agricultural lands. Only four of 644 roost observations used by Austin and Richert (2001) were of whooping cranes that roosted in flooded cropland, while most observations of roosting whooping cranes outside of Nebraska occurred in vegetated wetlands. Of these observations, only 12% occurred in lacustrine or lakeside wetlands. The proposed project area contains numerous waterbodies. Many of the waterbodies in the project area could currently be considered lakes with lacustrine wetlands (approximately 1527 ac based on National Wetland Inventory maps); however, there are palustrine wetlands in the area (approximately 2896 acres based on Wetland Inventory maps). The project area also contains some cultivated fields that may provide potential foraging habitat. Overall the project area contains some potential habitat for migrating whooping cranes, but most historic whooping crane use has occurred west of the project area.

The potential exists, although remote given their very low numbers and that the main flyway is west of the project, for whooping cranes to fly through the area during migration. Whooping cranes generally migrate at 1,000-5,000 ft, altitudes well above turbine height (Tom Stehn, USFWS, <http://www.learner.org/jnorth/spring1998/jnexpert/ CraneAnswer.html>), and thus for the most part are unlikely to collide with turbines. However, as whooping cranes ascend and descend during takeoff and landing, or migrate during inclement weather, they may fly at lower altitudes and may fly within rotor-swept areas.

Piping Plover (Threatened). According to the USFWS, more piping plovers nest in North Dakota than in any other state. The species nests along midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of alkaline wetlands. The shores of Lake Sakakawea and areas dominated by alkaline wetlands have been ruled as critical habitat for the piping plover

(USFWS 2001). The closes designated critical habitat for piping plovers is approximately 5-7 miles southeast of the proposed wind farm area

The North Dakota Natural Heritage Inventory does not have any records for piping plovers within the proposed project area (NDPRD letter, Appendix B). The wetlands and waterbodies within the project area (viewed during the November 22, 2004 site visit) did not exhibit the saline wetland characteristics used by piping plovers in non-riverine areas of North Dakota (USFWS 2001). Most or all wetlands had vegetation extending to the waterline.

While no potential nesting habitat for the piping plovers was observed within the project area, the potential exists for the species to fly through the project area during migration. Little is known concerning the migration habits of the piping plover, and it is not known if the species migrates along major river systems or flies in direct north-south pattern.

Bald Eagle (Threatened). In previous discussions and correspondence with the USFWS, the USFWS described the bald eagle as migrating primarily along major rivers through North Dakota. Wintering bald eagles are often associated with lakes, rivers, and reservoirs where they feed primarily on fish (Johnsgard 1990). In North Dakota, eagles have been known to concentrate during the winter along the Missouri River. Bald eagles may also be found during migration and winter periods in areas away from major rivers if sufficient forage (e.g., carrion) is available. Like most raptors, bald eagles are potentially found in the project area during migration. Two bald eagles were documented in the project area during the November 22, 2004 site visit.

Bald eagles nest in areas with mature forest, typically along major water ways, lakes, and reservoirs. However, with increasing bald eagle populations, nesting eagles are also being found in areas away from “major” waterbodies. Limited nesting habitat is present within the project area in the form of mature cottonwood trees. One potential eagle nest was located in the project area during the November 22, 2004 site visit. Because of the time of year, actual species use (e.g., eagle or large red-tailed hawk nest) or occupancy (*i.e.*, active vs. inactive) could not be determined for the single nest located. The USFWS recommended a spring survey to determine species use and occupancy of the nest (USFWS letter, Appendix B). If it is determined that the nest is an active bald eagle nest, PPM proposed a one-mile buffer around the nest. The USFWS agreed that a one-mile buffer with no disturbance should be sufficient to minimize impacts.

WEST is unaware of any documented bald eagle fatalities at wind power facilities (Erickson et al. 2001, Erickson pers. comm.), even when bald eagles are known to nest within relative close proximity of wind farms (e.g., nest within 5-miles of the Foote Creek Rim wind farm site both before and after turbine construction).

Migratory Birds. Most species of migratory birds are protected by the Migratory Bird Treaty Act (MBTA). The USFWS lists 29 birds as species of concern within the Prairie Pothole Region (USFWS 2002). Most of these species do not receive special protection beyond the MBTA, but they have been identified as vulnerable to population decline in the area by the USFWS. The Interim USFWS Guidelines use migratory birds and potential impacts to them as one factor in the PII score. See Section III.B. for a discussion of the PII score.

Of the nine project areas and associated studies reviewed by Erickson et al. (2001), all had documented bird mortalities. Data from these studies indicated that there was an average of 2.19 fatalities/turbine/year for all birds (0.033 are raptors). If projects in California are removed, the result is 1.83 fatalities/turbine/year for all birds (0.006 are raptors). Studies from 1996-1999 at the Buffalo Ridge wind farm, Minnesota, estimated 0.98 fatalities/turbine/year (Johnson et al. 2002). More recent studies conducted in the eastern U.S. (Erickson et al. 2001 contained the eastern studies done at the point in time) indicate a similar to slightly higher level of avian mortality, as was summarized by Erickson et al. For example, a wind farm located at Mountaineer, WV, had a bird mortality rate of between 2-3 birds/turbine/year and Buffalo Mountain, TN had a bird mortality rate of 10-12 birds/turbine/year (Erickson et al. 2004). Total annual impacts from all wind farms, calculated in 2001, were 10,000-40,000 birds. This compares to avian mortality estimates of 60-80 million/year from vehicles, 98-980 million/year for buildings and windows, tens of thousands to 174 million/year for power lines, and 4-50 million/year for communication towers (Erickson et al. 2001). Based on general habitat characteristics and species composition compared to other wind farms, it is reasonable to assume that bird fatalities associated with a wind farm developed at the proposed Rugby Wind Farm would be similar to those fatality rates documented in other locations. To reduce potential impacts to migratory birds, in particular raptors, the USFWS recommended that overhead power lines, if needed, be constructed in accordance with the current guidelines for preventing raptor electrocutions.

Besides the direct impact of wind turbines on migratory birds (*i.e.*, fatality), concerns have also been raised regarding indirect impacts to breeding birds, however there is uncertainty regarding this degree of indirect impacts. In Minnesota, researchers have found that breeding songbird density on CRP grasslands was reduced in the immediate vicinity of turbines (Leddy et al. 1999), but changes in density at broader scales was not detectable (Johnson et al. 2000b). It is difficult to estimate the indirect impacts of the proposed wind farm.

Prairie Grouse.

While the USFWS did not identify sharp-tailed grouse as an issue in correspondence to date, the USFWS has identified prairie grouse as a concern on the national level (Manville 2004). Sharp-tailed grouse were observed in the project area during the November 22, 2004 site visit. It is likely that leks are located in the project area, but no known lek surveys to document the locations have been identified. Turbines should not be placed on known lek locations.

Grassland, Wetland, and Woodland Resources

The proposed project area contains a minimal amount of woodland areas. Most treed areas are in the form of farmsteads and tree rows, but there are areas of native woodlands around the wetlands and lakes. Current plans do not include the placement of turbines in these woodland areas, minimizing potential impacts to the woodland resource. If trees and shrubs are impacted by the project, the USFWS recommended a 2:1 restoration effort. Grassland resources are discussed in section III.A.3 and wetland resources are discussed in section III.A.5.

III.A.3. State Wildlife Issues and Native Grasslands

The NDGFD identified disturbance to native prairie as their primary concern (NDGFD letter, Appendix B). The USFWS also expressed concerns regarding impacts to native grasslands. While exact turbine locations have not been identified at this time, the overall project area contains areas of native grasslands and it is likely that plans will include placement of turbines in these areas. The grasslands are currently utilized for livestock grazing, with some areas receiving significant grazing pressure. The NDGFD and USFWS generally recommend minimizing the number of turbines, roads, and other facilities in native grassland areas. The USFWS notes that where construction in native areas is unavoidable, impacts should be minimized by using larger turbines, limiting new road construction, and timing construction for late summer (after July 15). The USFWS also recommends reseeding disturbed areas with native seed stocks from nurseries located within a 250-mile radius of the project area.

III.A.4. Unique Habitat

The proposed wind farm project area is located in the prairie pothole region, and as such contains a number of wetlands and lakes along with areas of native grasslands. While this habitat type is not “unique” to the Rugby area (e.g., the prairie pothole region extends over portions of South Dakota, Minnesota, North Dakota, and Canada), concerns have been raised by various parties regarding its general loss.

III.A.5. Wetlands and USFWS Wetland Easements

Information concerning wetlands is based on general field observations and NWI maps and not on formal delineations. Numerous wetlands and waterbodies are located in the project area. Many of the wetlands are under USFWS easements. Currently, preliminary plans are to avoid placing any turbines, roads, or other features in jurisdictional wetlands or wetlands with USFWS conservation easements.

Maps of wetlands, USFWS wetland easement areas, and Wildlife Production Areas were provided by the USFWS to HDR Engineering for project planning purposes. If needed, formal wetland delineations and permitting will be completed before construction.

III.A.6. Bats

There are several species of bats found in North Dakota, including the big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), long-legged bat (*Myotis volans*), eastern red bat (*Lasiurus borealis*), little brown bat (*Myotis lucifugus*), long-eared bat (*Myotis evotis*), western small footed myotis (*Myotis ciliolabrum*), northern myotis (*Myotis septentrionalis*), Townsend’s big-eared bat (*Corynorhinus townsendii*), silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), and red bat (*Lasiurus borealis*) (<http://www.batcon.org/discover/species/nd.html>, Grondahl no date). The USFWS formerly had listed the long-eared bat, big-eared bat, long-legged bat, and small-footed myotis as candidate species. Based on information from two web sites (<http://nationalatlas.gov/natlas/natlasstart.asp>, <http://www.batcon.org/>) none of the former candidate species have been found in the project area.

Potential roosting habitat within the wind farm project areas is found in the form of trees and a few old buildings. No caves were observed during the site visit or reported by agency personnel. Bats may forage over the entire project area, although the extent of use is not known.

Bat casualties have been reported from most wind farms where post-construction fatality data are publicly available. Reported estimates of bat mortality at wind farms through 2001 ranged from 0.07 – 10.0 per turbine per year in the U.S. (Table 2). Most of the bat casualties at wind farms have been migratory species that conduct long migrations between summer roosts and winter hibernacula, but mortalities of numerous species have been found. Examples of species commonly found as fatalities at windpower facilities include hoary bats, silver-haired bats and eastern red bats. A recent report of bat fatalities at a wind farm in West Virginia included relatively high numbers of red bats, hoary bats, eastern pipistrelle (*Pipistrellus subflavus*) and little brown bats over the course of one year, up to 47.53 bats/turbine/year (Kerns and Kerlinger 2004). The West Virginia site is located on a prominent, relatively narrow ridge in the Appalachian Mountains and may be located within a bat migration corridor. The causes of the relatively high number of migratory bat deaths at some windpower facilities are not well understood. Some researchers have suggested it may be related to the lack or reduction of echolocation during migration (Johnson 2003). Furthermore, field methods to provide strong quantitative predictions of migratory bat use are lacking.

Table 2. Reported bat fatality estimates for windpower facilities in the U.S from Johnson (2003).

Location	Year	Mean annual mortality	Bat mortalities per turbine	Notes
Buffalo Ridge, MN P1	1999	5	0.07	Adjusted for search biases
Buffalo Ridge, MN P2	1998-2001	289	2.02	Adjusted for search biases
Buffalo Ridge, MN P3	1999-2001	319	2.32	Adjusted for search biases
Wisconsin	1999	34	1.10	Not adjusted for search biases
Foote Creek Rim, WY	1998-2001	138	1.04	Adjusted for search biases
Buffalo Mtn., TN	2001	30	10.0	Not adjusted for search biases
Vansycle, OR	1999	28	0.40	Adjusted for search biases

Due to a lack of information concerning bat migration habits, it is difficult to predict if the proposed project area is located within a bat migration corridor. However, unlike the West Virginia site, the proposed project area does not appear to contain topographic features that may funnel migrating bats (Figure 2). The proposed wind project will likely result in some bat mortality, but the magnitude of these fatalities is difficult to determine. The Buffalo Ridge, Minnesota project area contained features similar to the Rugby Wind Farm in that there were numerous wetlands, croplands, woodlots, etc. Even in these habitats (e.g., potential foraging areas around wetlands and woodlots) significant bat mortalities were not documented.

III.A.7. Avian Migratory Pathways

Many species of songbirds and waterfowl migrate at night and thus may collide with tall, man-made structures. Although most birds migrate at altitudes greater than those associated with most wind turbines and towers, large numbers of songbirds have been documented colliding with lighted communication towers and buildings when foggy conditions and spring or fall migration coincide. To date, no large mortality events on the same scale as those seen at communication towers have been documented at windpower facilities in North America (Erickson et al. 2001). However, turbines used by many wind developers are getting taller and require lighting by the

Federal Aviation Administration; this may increase the risk of collision by nocturnal migrants with wind turbines.

Little is known for certain regarding what landscape cues migratory birds use during migration. For this project, migratory pathways are considered on a continental, regional, and local scale. On a continental scale, the proposed project area is not located near an ocean coast or immediately near a large mountain range (e.g., Rocky Mountains); features that could impact migration on a continental scale. Likewise on a regional scale, the proposed project is located in an area of open, rolling hills. There are not any obvious “funnels” (e.g., gaps in mountains, Missouri River) or other migratory paths (e.g., long ridge lines) leading into or out of the wind farm area that could potentially serve as a migratory path on a regional scale. On a local scale, the wetlands and waterbodies may serve as a local attractant for migrating song birds to stop over while moving as part of a large “broad front” migration once they are in the project area. These broad front migration events can be episodic (Evans 1998), making them difficult to predict.

The area does contain significant migratory stopover for waterfowl in the spring and fall. This is not necessarily unique to the project area as it is seen throughout the larger prairie pothole region.

III.B. USFWS Guidelines and PII Score

The USFWS issued “Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines” in 2003. Application of the guidelines is voluntary. The voluntary guidelines are meant to assist the USFWS and the wind energy industry to locate projects to minimize or avoid wildlife impacts by providing a standardized approach to evaluate proposed project areas against other reference areas.

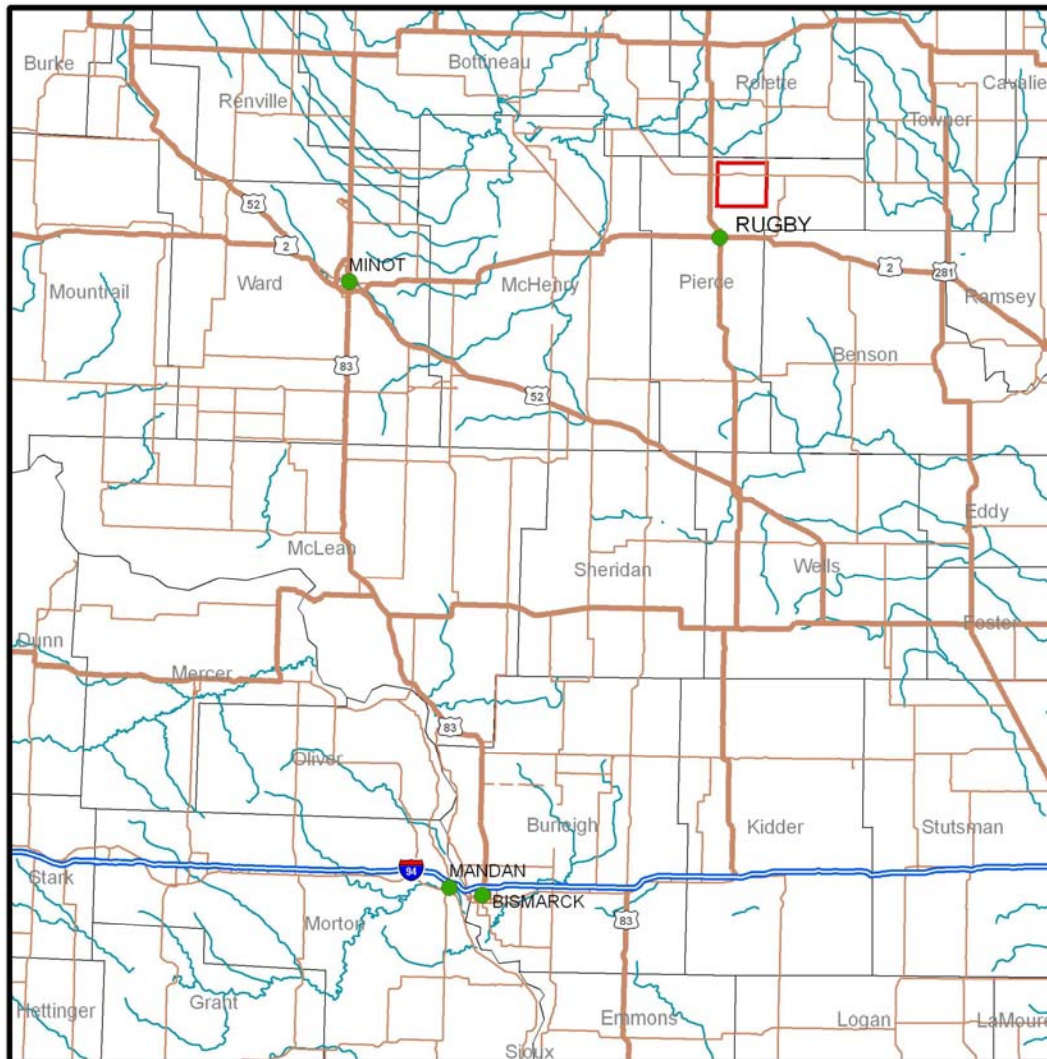
WEST personnel visited the proposed wind farm project area with NDGFD personnel on November 22, 2004 and completed the field portion of the interim guidelines (*i.e.*, physical attribute checklist, ecological attractiveness checklist). Once in the office, WEST completed the remaining worksheets (*i.e.*, species occurrence and status checklist) for determining the Potential Impact Index (PII) scores (Appendix C). The PII developed for this project uses the Audubon National Wildlife Refuge near Lake Sakakawea as a reference site. Potential species occurrence was based on the bird distribution maps found in range guides (Stewart 1975), and the site visit. Potential bat occurrence is based on range maps located on a government web site (<http://nationalatlas.gov/natlas/natlasstart.asp>) and a web site maintained by Bat Conservation International (<http://www.batcon.org/>).

The PII for the proposed wind farm project area was 177. The PII score for the Audubon NWR reference site was 216. The Interim Guidelines state that a reference site should be selected such that it has more ecological concerns and a higher score. The Audubon NWR was selected for the reference site because it would likely have a higher PII score than the project site. The reference site is publicly available land located near the project area but with more species, “better” habitat characteristics for several threatened and/or endangered species (e.g., piping plover), more threatened and endangered species, and a special designation. In addition, the USFWS did not have any existing data on other PII scores within the state for comparison.

IV. SUMMARY

The purpose of this report is to identify potential conflicts that a wind farm developed in the proposed area could have on wildlife and wildlife habitat. Discussions with state and federal agency personnel, a reconnaissance-level site visit, and review of published and unpublished literature were all used to identify these potential conflicts. The proposed wind farm area is located in an area with wetlands and waterbodies, areas of cultivated agriculture, and areas of native mixed-grass prairie. This area provides habitat for numerous species, some of which are identified as species of concern. These species include grassland nesting birds, raptors, and prairie grouse. A potential bald eagle nest was located near the southern edge of the project area. The area is also an important migratory area for waterfowl as part of the prairie pothole region. Many of the same landscape features found in the proposed Rugby Wind Farm area are found in other wind farm projects (e.g., Buffalo Ridge has wetlands and waterbodies, CRP, cropland, etc.). The USFWS recommended that post-construction mortality studies be conducted to determine the effect of the wind farm on avian species. These studies would help confirm the presumption that direct mortality from this wind farm are likely to be similar as other wind farms in the Midwest and West.

The Interim USFWS Guidelines PII score is used as one tool to combine species use, landscape features, and ecological features into one measurement. The PII score for the proposed Rugby Wind Farm was 177. The score for a reference area located at the Audubon NWR was 216. The Rugby Wind Farm PII score is lower than the Audubon NWR reference area because of many of the items identified in Section III.B. Specifically, the Audubon NWR has potential habitat for more species of concern, is a potential migratory funnel, and has special designation. The score of 177 for the Rugby site can be generally attributed to the presence of native grassland and wetlands as part of the larger prairie pothole region. These landscape features make it “possible” for native species of concern, identified in the PII scoring process, to occur in the project area. It is likely that other wind projects of this scope proposed for development in the prairie pothole region would have PII scores of similar magnitude if they encompass areas of native grasslands and wetlands.



Rugby Project Area

 Rugby Site Boundary

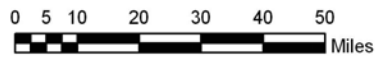
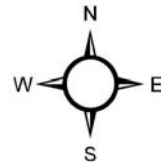


Figure 1. Rugby Wind Farm proposed project area.

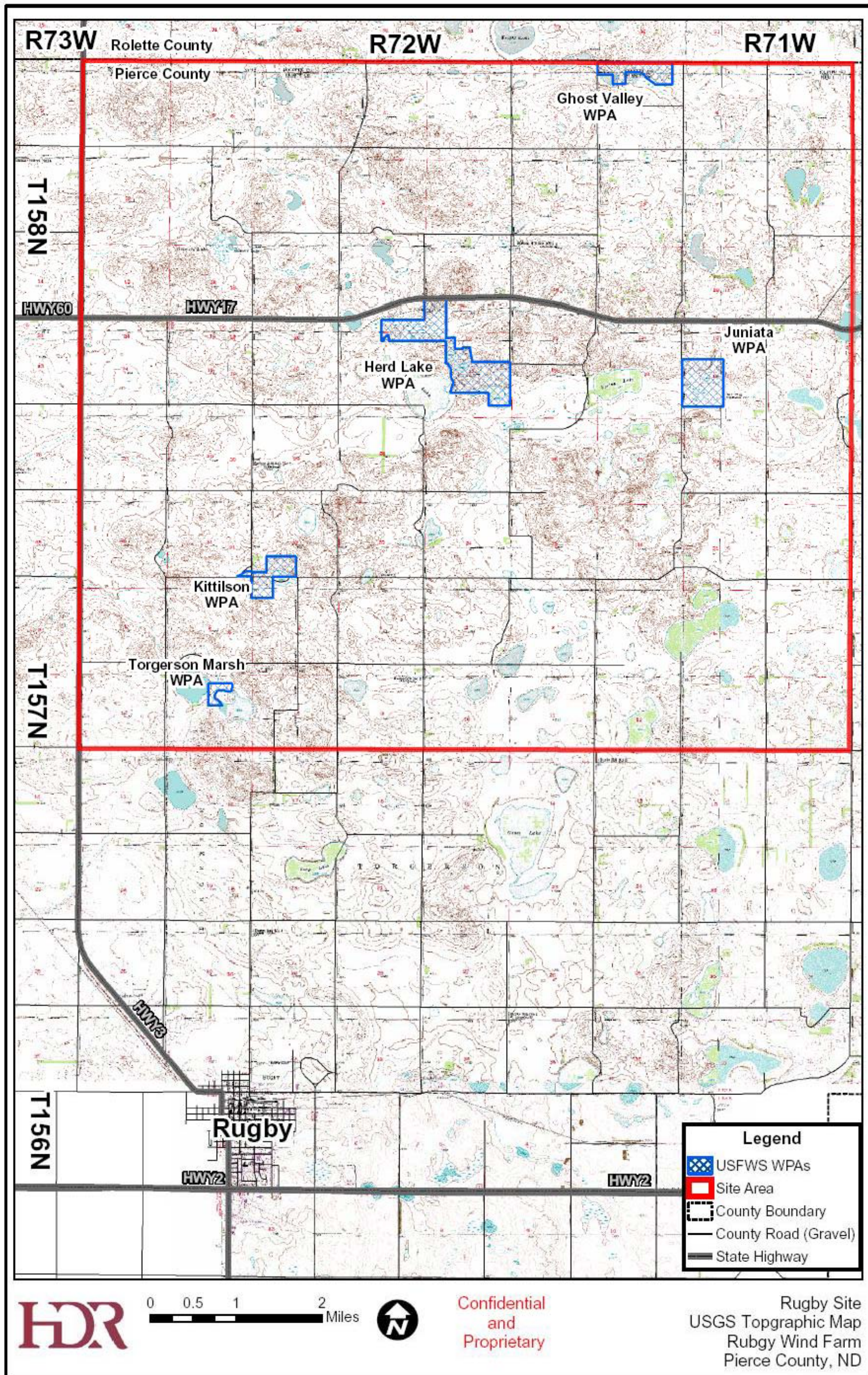


Figure 2. Rugby Wind Farm proposed project area detailed map.

V. LITERATURE CITED

- Anderson, R., M. Morrison, K. Sinclair, D. Strickland. 1999. Studying wind energy/bird interaction: a guidance document. Prepared for the Avian Subcommittee and National Wind Coordinating Committee. 87 pp.
- Austin, J.E. and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-1999. Unpublished report prepared for the U.S. Fish and Wildlife Service.
- Erickson, W.P., G.D. Johnson, M.D. Strickland, K.J. Sernka, and R.E. Good. 2001. Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States. Prepared for the National Wind Coordinating Committee. Available at <http://www.west-inc.com>
- Erickson, W., M.D. Strickland, G. Johnson, D. Young. 2004. Update on bird and bat impacts at wind energy project. Presentation at the 2004 TWS International Conference.
- Evans, W.R. 1998. Acoustic detection of nocturnal bird migration at a proposed wind turbine site in north-central Nebraska. Unpublished report to the Nebraska Public Power District.
- Grondahl, C. No Date. Small Mammals of North Dakota. North Dakota Game and Fish Department, Bismarck, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page.
<http://www.npwr.usgs.gov/resource/distr/mammals/mammals/mammals.htm>
(Version 15AUG97).
- Johnsgard, P.A. 1990. Hawks, eagles, and falcons of North America: Biology and natural history. Smithsonian Institution Press, Washington D.C.
- Johnson, G.D. 2003. What is known and not known about bat collision mortality at windplants? In R.L. Carlton, editor. Avian interactions with wind power structures. Proceedings of a workshop in Jackson Hole, Wyoming, USA, October 16-17, 2002. Electric Power Research Institute, Palo Alto, California. In Press.
- Johnson, G.D., D.P. Young, Jr., W.P. Erickson, C.E. Derby, M.D. Strickland and R.E. Good. 2000a. Wildlife Monitoring Studies, SeaWest Windpower Project, Carbon County, Wyoming, 1995-1999. Prepared for SeaWest Energy Corporation, San Diego, CA, and Bureau of Land Management, Rawlins.

- Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd and D.A. Shepherd. 2000b. Avian Monitoring Studies at the Buffalo Ridge, Minnesota Wind Resource Area: Results of a 4-year study. Tech. Rept. Prepared for Northern States Power Co., Minneapolis, MN. 262pp.
- Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd, D.A. Shepherd, and S.A. Sarappo. 2002. Collision mortality of local and migrant birds at a large-scale wind-power development on Buffalo Ridge, Minnesota. *Wildlife Society Bulletin* 30(3):879-887.
- Kerns, J. and P. Kerlinger. 2004. A study of bird and bat collision fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia: annual report for 2003. Technical Report prepared for FPL Energy and Mountaineer Wind Energy Center Technical Review Committee.
- Leddy, K.L., K.F. Higgins and K.F. Naugle. 1999. Effects of wind turbines on upland nesting birds in Conservation Reserve Program grasslands. *Wilson Bulletin* 111: 100-104.
- Manville, A.M., II. 2004. Prairie grouse leks and wind turbines: U.S. Fish and Wildlife Service justification for a 5-mile buffer from leks; additional grassland songbird recommendations. Division of Migratory Bird Management, USFWS, Arlington, VA, peer-reviewed briefing paper. 17 pp.
- Stewart, R.E. 1975. Breeding Birds of North Dakota. Tri-College Center for Environmental Studies, Fargo, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page.
http://www.npwrc.usgs.gov/resource/distr/birds/bb_of_nd/bb_of_nd.htm
(Version 06JUL2000).
- USFWS (U.S. Fish and Wildlife Service). 2001. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover; Proposed Rule. 50 CFR Part 17.
- USFWS (U.S. Fish and Wildlife Service). 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. 99 pp. [Online version available at <<http://migratorybirds.fws.gov/reports/bcc2002.pdf>>]
- USFWS (U.S. Fish and Wildlife Service). 2003. Service interim guidance on avoiding and minimizing wildlife impacts from wind turbines. Technical memorandum to Regional Directors, Regions 1-7.

APPENDIX A
Letters Sent to the USFWS, NDGFD, and NDPRD by HDR Engineering

December 3, 2004

Mr. Terry Ellsworth
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Ellsworth:

HDR Engineering, Inc. appreciates your and Mr. Albright's input on siting this proposed wind project. Please review the Rugby Wind Farm project for potential effects to known federally-listed threatened or endangered species and rare natural features. This request is made pursuant to Section 7 of the Endangered Species Act of 1973, as amended. In addition, please review this project in relation to the USFWS refuge system, including Waterfowl Protection Areas and easements.

The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
157 N	71 W	5-8
157 N	72 W	1-12
158 N	71 W	7-8, 17-20, 29-32
158 N	72 W	7-36

Enclosed is map detailing the location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

Sincerely,

Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Lee Albright, US Fish and Wildlife Service
Mr. Tim Seck, PPM Energy

December 3, 2004

Mr. Dean Hildebrand
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Hildebrand:

HDR Engineering, Inc. requests your review of the above-mentioned project for potential effects to known federally-listed threatened or endangered species and rare natural features.

The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
157 N	71 W	5-8
157 N	72 W	1-12
158 N	71 W	7-8, 17-20, 29-32
158 N	72 W	7-36

Enclosed is map detailing the location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

Sincerely,

Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Steve Dyke, North Dakota Game and Fish Department
Mr. Tim Seck, PPM Energy, Inc.

December 3, 2004

Ms. Kathy Duttenhefner
ND Natural Heritage Inventory
North Dakota Parks & Recreation Department
1600 East Century Avenue
Bismarck, ND 58503-0649

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Duttenhefner:

HDR Engineering, Inc. requests a database review for the above-mentioned project. The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
157 N	71 W	5-8
157 N	72 W	1-12
158 N	71 W	7-8, 17-20, 29-32
158 N	72 W	7-36

Enclosed is map detailing the proposed location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

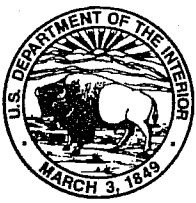
Sincerely,

Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Tim Seck, PPM Energy, Inc.

APPENDIX B
Letters Received from the USFWS, NDGFD, and NDPRD



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501



RECEIVED

JAN 12 2005

JAN 10 2005

HDR Engineering, Inc.

Ms. Michelle Bissonnette, Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, Minnesota 55416

Dear Ms. Bissonnette:

I am writing in response to your December 3, 2004, request for information on threatened and endangered species in relation to a proposed wind power project near Rugby, North Dakota. The proposed project includes construction of 67 to 100 1.5-MW wind turbines, access roads, and ancillary facilities. The proposed location for the wind power project is in Pierce County:

T. 157 N., R. 71 W., Sections 5-8

T. 157 N., R. 72 W., Sections 1-12

T. 158 N., R. 71 W., Sections 7, 8, 17-20; 29-32

T. 158 N., R. 72 W., Sections 7-36

In general, wildlife resources and issues that warrant consideration during project planning include: migratory birds (e.g., collisions and electrocutions); tribal, state or Federal land interests; wetlands, prairie, and woodland habitats; Clean Water Act - Section 404 activities; threatened and endangered species; ancillary facility development (e.g., roads, substations, underground cables, or overhead transmission lines); and monitoring, research, and assessment. Natural resources and issues that may be applicable to your project are further addressed below.

Migratory Birds

Adequate consideration to bird resources early in the site evaluation process can minimize impacts and facilitate project construction. Although current wind turbine technology minimizes the incidence of avian death due to blade and tower strikes, direct mortality of some migratory birds will continue to occur. The Fish and Wildlife Service (Service), under the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Act, the Endangered Species Act, and Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," is directed to protect migratory birds. The provisions of these Acts generally make it unlawful to take migratory birds. However, being responsive to Congressional and Presidential mandates, treaties, and legislation, wind power developers, in concert with the Service, can cooperatively ensure projects proceed in a positive manner. Together, we have a responsibility to scientifically

determine the factors in siting and operation of wind power plants that contribute to avian fatalities and to implement measures to minimize impacts to migratory birds.

To minimize the electrocution hazard to birds, the Service, with support from the Rural Utilities Service, recommends that new or updated overhead power lines be constructed in accordance with the current guidelines for preventing raptor electrocutions. The recommended guidelines can be found in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996". To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, the Service recommends power lines that cross or run adjacent to rivers or large wetlands be modified according to "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994". Both publications can be obtained by writing or calling the Edison Electric Institute, P.O. Box 266, Waldorf, Maryland, 20604-0266, (1-800-334-5453) or visiting their website at www.eei.org.

Research, Monitoring and Assessment

We encourage project proponents to conduct collision monitoring studies designed to determine the effect of several factors, such as site selection, turbine designs, the layout of wind plants, wind plant operations, habitat alteration, and changes in available perching and nesting sites on bird deaths. The Avian Subcommittee of the National Wind Coordinating Committee (NWCC) has developed a guidance document to assist wind energy developers in designing studies that will produce credible and comparable results of avian interaction with wind power plants. The NWCC document, "Studying Wind Energy/Bird Interactions: A Guidance Document. Metrics and methods for determining or monitoring potential impacts on birds at existing and proposed wind energy sites," can be obtained by contacting the National Wind Coordination Committee, c/o RESOLVE, 1255 23rd Street, Suite 275, Washington, D.C. 20037, or by visiting their website at www.nationalwind.org). The Service currently is compiling a list of research and monitoring issues related to wind power development in the Dakotas. We look forward to sharing these ideas with you and other industry representatives, and cooperatively developing a reasonable approach to acquisition of information that may help identify additional measures to minimize impacts to wildlife resources.

Fish and Wildlife Service Property Interests

As part of the National Wildlife Refuge System, the Service administers fee title Refuge and Waterfowl Production Areas, as well as wetland and grassland easements throughout North Dakota. Lee Albright, Wetland Manager, J. Clark Salyer National Wildlife Refuge, has provided HDR Engineering (HDR) with current Service property information for the proposed project area.

Wetland, Grassland, and Woodland Resources

The proposed project area is located in the Drift Prairie region of North Dakota and includes areas of native mixed-grass prairie. Since the 1800s, North Dakota has lost approximately 75-90 percent of its native grasslands primarily due to crop production.

Native prairie has significant natural resource values including:

- Provides habitat for a number of migratory grassland birds whose populations are declining.
- Provides nesting habitat for millions of waterfowl.
- Contains 200-300 plant species, which provide genetic diversity important to agriculture and medicine.
- Provides habitat for thousands of insects including the Dakota skipper, a candidate species, and other butterflies (Ex: Regal fritillary, Tawny crescent).
- Crucial for soil and water conservation.
- Provides recreational opportunities (hunting, bird watching/wildlife observation, hiking).
- Living laboratories for scientific research.

Our review of National Wetlands Inventory (NWI) maps indicates that wetland areas are located within the project area. NWI data can be accessed directly by visiting their website at www.wetlands.fws.gov. We recommend you avoid construction of wind towers and ancillary facilities in or adjacent to wetlands when possible.

Construction activities should be conducted in a manner that will minimize impacts to the existing habitat in the project area. Where impacts are unavoidable, we recommend that you:

- Time construction for late summer (after July 15) or fall so as not to disrupt waterfowl or other wildlife during the nesting season.
- Avoid construction in native prairie if possible and reseed disturbed native prairie with a comparable native grass/forb seed mixture. Obtain seed stock from nurseries within 250 miles of the project area to insure the particular cultivars are well adapted to the local climate.
- Minimize grassland disturbance by using fewer, larger turbines and limiting new road construction.

- Use underground transmission lines between turbines, as well as to the primary substation.
- Locate ancillary facilities to avoid placement of fill in wetlands along the route.
- Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area.
- Replace unavoidable wetland losses with functionally equivalent wetlands and replace trees or shrubs destroyed during construction on a 2:1 basis.

Section 404 program

Section 404 of the Clean Water Act regulates placement of fill materials in wetlands. A Corps of Engineers' 404 permit may be required if fill material will be placed in aquatic sites including wetlands. Contact Mr. Dan Cimarosti, Regulatory Office, Corps of Engineers, 1513 South 12th Street, Bismarck, North Dakota 58504 (701-255-0015), to determine their permit requirements. If a 404 permit is required, the Service will provide recommendations on this project to the Corps.

Threatened and Endangered Species

A list of federally threatened and endangered species that may occur within the proposed project's area of influence is enclosed. This list fulfills requirements of the Fish and Wildlife Service under Section 7 of the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the Federal agency or its designated agent determines the action "is likely to adversely affect" listed species or modify critical habitat, the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "no effect" determination on listed species or critical habitat, further consultation is not necessary. If a private entity receives Federal funding for a construction project, or if any Federal permit is required, the Federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation.

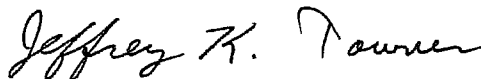
Section 10(a)(1)(B) of the Endangered Species Act allows non-Federal parties planning activities that have no Federal nexus, but which could result in the incidental taking of listed animals, to apply for an incidental take permit. The application must include a habitat conservation plan (HCP) laying out the proposed actions, determining the effects of those actions on affected fish and wildlife species and their habitats (often including proposed or candidate species), and defining measures to minimize and mitigate adverse effects.

During a site visit November 22, 2004, North Dakota Game and Fish Department (Department) staff observed a large nest structure in T. 157 N., R. 72 W., Section 1, SW $\frac{1}{4}$. At the time of the field review, it could not be determined if the structure was a bald eagle nest or if it was built by some other raptor species. Bald eagles prefer forested habitats near bodies of water and most nest sites are located within one half mile of water. Adult bald eagles mate for life and tend to use the same nest year after year. Bald eagle nesting activity begins in mid-February and the young are usually fledged by mid-July. Although individual bald eagle pairs can show considerable tolerance to human activity, every effort must be made to minimize disturbance of nesting pairs. The Service recommends conducting a spring survey of the nest structure prior to project construction to determine the status of the potential bald eagle nest. Please forward the results of the survey to this office for our records.

On December 29, 2004, the Service met with the Department, HDR, and PPM Energy to discuss potential project issues. At that meeting, HDR Engineering presented a proposal to create a one mile buffer area around the potential bald eagle nest. If a survey indicates that the nest structure is being used by nesting bald eagles, a one mile buffer area with no disturbance should be sufficient to minimize impacts to nesting birds.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact Terry Ellsworth of my staff at 701-250-4481, or at the letterhead address above.

Sincerely,



Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosure

cc: ARD, ES, Denver (MAIL STOP 60120)
(Attn: R. Dach)
J. Clark Salyer WMD
(Attn: L. Albright)
Regulatory Office, Army Corps of Engineers, Bismarck
(Attn: D. Cimarosti)
Director, ND Game & Fish Department, Bismarck
(Attn: M. McKenna)

FEDERAL THREATENED AND ENDANGERED SPECIES
AND DESIGNATED CRITICAL HABITAT FOUND IN
PIERCE COUNTY, NORTH DAKOTA

January 2005

ENDANGERED SPECIES

Birds

Whooping crane (Grus Americana): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

THREATENED SPECIES

Birds

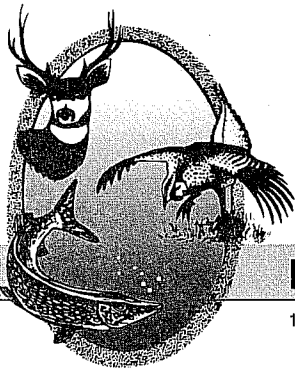
Bald eagle (Haliaeetus leucocephalus): Migrates spring and fall statewide but primarily along the major river courses. It concentrates along the Missouri River during winter and is known to nest in the floodplain forest.

Piping plover (Charadrius melodus): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

DESIGNATED CRITICAL HABITAT

Birds

Piping Plover - Alkali Lakes and Wetlands - Critical habitat includes: (1) shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; (2) springs and fens along edges of alkali lakes and wetlands; and (3) adjacent uplands 200 feet (61 meters) above the high water mark of the alkali lake or wetland.



"VARIETY IN HUNTING AND FISHING"

RECEIVED

JAN 20 2005

HDR Engineering, Inc.

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

January 14, 2005

Michelle Bissonnette
Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Dear Ms. Bissonnette:

RE: Rugby Wind Farm, Pierce County, North Dakota

The North Dakota Game and Fish Department has reviewed the proposed project area for wildlife concerns. Currently, this project proposes to place approximately 67 to 100 1.5 MW turbines north of the city of Rugby. Our primary concern is the disturbance of native prairie associated with construction of turbines, access roads, transmission lines, etc. We recommend the US Fish and Wildlife Service wind turbine siting guidelines be implemented as appropriate. We would appreciate being kept informed as this project progresses, and as other wind power projects are developed.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael G. McKenna". The signature is fluid and cursive.

Michael G. McKenna
Chief
Conservation & Communication Division

js

RECEIVED

DEC 20 2004

HDR Engineering, Inc.



John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@state.nd.us
www.ndparks.com

December 14, 2004

Michelle Bissonnette
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Re: Rugby Wind Farm Project
Pierce County, North Dakota

Dear Ms. Bissonnette:

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above referenced wind farm project located in Sections 5-8, T157N, R71W; Sections 1-12, T157N, R72W; Sections 7-8, 17-20, and 29-32; T158N, R71W; and Sections 7-36, T158N, R72W, Pierce County.

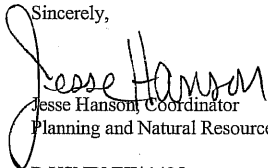
Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage Inventory has limited rare species information from the project area. Due to the lack of available survey data we cannot give an accurate assessment as to potential impacts to rare species and associated habitats.

The NDPRD recommends that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttonhefner (701-328-5370 or kgduttonhefner@state.nd.us) of our staff if additional information is needed.

Sincerely,


Jesse Hanson, Coordinator
Planning and Natural Resources Division
R.USNDNHI*1425

.....
Play in our backyard!

APPENDIX C
USFWS Interim Guidelines PII Scoring Sheets

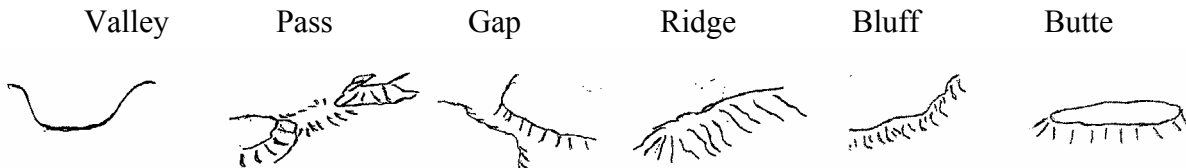
PHYSICAL ATTRIBUTE CHECKLIST

				Site				
Physical Attribute				Rugby	Audubon NWR			
Topography	Mountain Aspect*	Side	W					
			E					
			N					
			S					
		Top						
		Foothill	W					
			E					
			N					
	S							
	Valley*							
	Pass*							
	Gap*							
Ridge*								
Bluff*								
Topographic Diversity				X				
Wind* Direction	S							
	N							
	E							
	W			X	X			
	Updrafts*							
Migratory* Corridor Potential	Latitudinal (N ↔ S)			X	X			
	Longitudinal (E ↔ W)							
	Wide Approaches (>30 km)*				X			
	Funnel Effect*	Horizontal			X			
Vertical								
Site Size (acres) & Configuration*	<640			X	X			
	>640 <1000			X	X			
	>1000 <1500			X	X			
	Turbine Rows not Parallel to Migration			X	X			
Infrastructure To Build	Transmission			X	X			
	Roads			X	X			
	Buildings*	Storage		X	X			
		Maintenance		X	X			
	Daily Activity			X	X			
	Substation			X	X			
Increased Activity*				X	X			
Totals				14	15			

PHYSICAL ATTRIBUTE CRITERIA - 36 categories, max $\Sigma = 36$.

Topography - Terrain characteristic within the ecological influence of the proposed wind farm, generally, but not restricted to ± 8 km.

Mountain Aspect - Aspect of topography for site of proposed development. Multiple categories may be checked.



Wind Direction - Compass direction *from* which prevailing winds approach. Multiple categories may be checked.

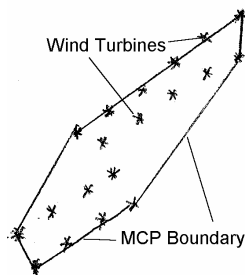
Updrafts - Do updrafts/upslope winds prevail?

Migratory Corridor Potential - Subjective estimate of area to be a potential avian/bat migratory corridor based strictly on topographical characteristics. Multiple categories may be checked.

Wide (>30 km) - Terrain characteristics of approaches to site from each migratory direction, i.e., a large plain, river corridor, long valley. The larger the area that migrant birds/bats are drawn from, the more may be at risk

Funnel Effect - Is the site in or near an area where migrant birds/bats may be funneled (concentrated) into a smaller area, either altitudinally, laterally, or both?

Site Size & Configuration – Size is estimated as if a minimum convex polygon (MCP) were drawn around peripheral turbines.



Successive boxes are checked to convey relationship of larger size = increased impact to birds/bats, e.g., a 700 acre site will have 2 categories checked while a 1200 acre site will have all 3 categories checked.

Configuration of turbine rows is usually perpendicular to prevailing wind direction. Rows aligned perpendicular or oblique to route of migration intuitively presents more risk to birds than rows aligned parallel to movement.

Buildings – Building are categorized by relative size and visitation frequency, *i.e.*, structures that are visited daily are usually larger and present more impact than those that are not. If a “Daily Activity” building is required, all Building categories are checked. If a maintenance structure is required, Storage is also checked.

Increased Activity - Will any type of human activity increase? Sites in urban-suburban or otherwise developed areas (oil, gas, mines) will have less impact on vertebrate wildlife than those in remote or undeveloped areas.

Avian Species of Special Concern Checklist
(Complete prior to SPECIES OCCURRENCE & STATUS CHECKLIST)

Birds (<i>n</i> = 29)	Site											
	Rugby			Audubon NWR								
	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
American Bittern	X	X	2	X	X	2						
Northern Harrier	X	X	2	X	X	2						
Swainson's Hawk	X	X	2	X	X	2						
Ferruginous Hawk		X	1	X	X	2						
Peregrine Falcon					X	1						
Yellow Rail												
Solitary Sandpiper												
Willet	X	X	2	X	X	2						
Upland Sandpiper	X	X	2	X	X	2						
Long-billed Curlew												
Hudsonian Godwit												
Marbled Godwit	X	X	2	X	X	2						
Sanderling												
White-rumped Sandpiper												
Buff-breasted Sandpiper												
Wilson's Phalarope	X	X	2	X	X	2						
Black-billed Cuckoo	X	X	2	X	X	2						
Burrowing Owl	X	X	2	X	X	2						
Short-eared Owl	X	X	2	X	X	2						
Red-headed Woodpecker	X	X	2	X	X	2						
Loggerhead Shrike	X	X	2	X	X	2						
Sprague's Pipit	X	X	2	X	X	2						
Grasshopper Sparrow	X	X	2	X	X	2						
Baird's Sparrow	X	X	2	X	X	2						
Henslow's Sparrow												
Le Conte's Sparrow	X	X	2	X	X	2						
Nelson's Sharp-tailed Sparrow	X	X	2	X	X	2						
McCown's Longspur												
Chestnut-collared Longspur	X	X	2	X	X	2						
Subtotals	18	19	37	19	20	39						
Total			37			39						

Avian Species of Special Concern Checklist (29 species, max Σ = 58)

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS CHECKLIST. Appropriate avian field guides and species accounts should be consulted for confirmation of species distribution and habitat associations.

In addition to species lists (rows), season of occurrence is also indicated (columns). “B” indicates breeding or summer occurrence and “M/W” indicates presence during migration or as wintering species. The USFWS guidelines for windpower development suggests that if occurrence within or in the vicinity (≤ 7 km) of a proposed site is confirmed or suspected, an “X” is entered. However, due to sharp differences in habitat and topography within 7 km of the proposed project, and X was only entered if it was likely the species would occur or fly through the project area based on topography and habitat features.

NOTE: These species were selected because they are listed as Birds of Conservation concern by the USFWS (2002) within BCR 11 (Prairie Potholes–U.S. portion only). Determinations of occurrence were based on the geographical location of the project area, habitat, Stewart (1975), and identification guides.

Bat Species Of Special Concern Checklist
 (Complete prior to SPECIES OCCURRENCE & STATUS CHECKLIST)

Bats (<i>n</i> = 4)	Site											
	Rugby			Audubon NWR								
Occurrence	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ
Long-eared Myotis												
Big-eared Bat												
Long-legged Myotis												
Small-footed Myotis												
Subtotals	0	0	0	0	0	0						
Total			0			0						

Bat Species Of Special Concern Checklist (4 species, max $\Sigma = 8$).

Column totals of this list are added to appropriate cells in the SPECIES OCCURRENCE & STATUS CHECKLIST. Appropriate bat field guides and references should be consulted for confirmation of species distribution and habitat associations.

In addition to species lists (rows), season of occurrence is also indicated (columns). "B" indicates breeding or summer occurrence and "M/W" indicates presence during migration or as wintering species. If occurrence within or in the vicinity (≤ 7 km) of a proposed site is confirmed or suspected, an "X" is entered.

NOTE: The Four bat species on this list were included because they are were formerly candidates for listing under the Federal Endangered Species Act in North Dakota (USFWS 1995). Species occurrence was based on the web site <http://nationalatlas.gov/natlas/natlasstart.asp> and species occurrence information from Bat Conservation International web site <http://www.batcon.org/> .

SPECIES OCCURRENCE & STATUS CHECKLIST

	Species	Site												
		Rugby			Audubon NWR									
		B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	B	M/W	Σ	
Threatened & Endangered	Occurrence													
	Interior Least Tern				X	X	2							
	Whooping Crane		X	1		X	1							
	Pallid Sturgeon					X	1							
	Bald Eagle	X	X	2	X	X	2							
	Piping Plover				X	X	2							
Candidate*	Dakota Skipper	X	X	2	X	X	2							
Special Concern*	Birds (max Σ=58)	18	19	37	19	20	39							
	Bats (max Σ=8)	0	0	0	0	0	0							
Bats*		X	1		X	1								
	Subtotals	20	23	43	23	27	50							
	Total			43			50							

SPECIES OCCURRENCE & STATUS CHECKLIST (39 categories, max Σ = 78)

Checklist totals for each column in “Avian Species of Special Concern List” and “Bat Species of Special Concern List are inserted in this checklist.

Threatened & Endangered Species - Species include in the Federal List of Endangered and Threatened Species (see attached letter).

Candidate Species - Species being investigated for inclusion in the Federal List of Endangered and Threatened Species. None were described by the USFWS.

Species of Special Concern – Birds of Conservation Concern (USFWS 2002) within BCR 11 were used to generate this list.

Bats (other than bat Species of Special Concern) are included due to generally unknown impacts of wind farms on individual and populations.

ECOLOGICAL ATTRACTIVENESS CHECKLIST

Site

Ecological Attractor		Rugby	Audubon NWR		
		Migration Route*	Local		
Continental*	N		x	x	
	S		x	x	
	E				
	W				
Ecological Magnets*	Lotic System				
	Lentic System		x	x	
	Wetlands		x	x	
	Native Grassland		x	x	
	Forest				
	Food Concentrated		x	x	
	Energetic Foraging				
	Vegetation/ Habitat	Unique		x	
		Diverse	x	x	
Significant Ecological Event*					
Site of Special Conservation Status*			2		
Total		7	10		

ECOLOGICAL ATTRACTIVENESS CRITERIA - 16 categories, max Σ = 17.

Migration Route - Indicates predominate direction of movement of seasonal migrations. Multiple categories may be checked.

Local - Some avian populations move only altitudinally & direction may be East-West (sage grouse, owls, bald eagles).

Continental - Some migratory corridors experience mass movements in only one season/direction annually (*e.g.*, Bridger Mountains autumn eagle migration).

Ecological Magnets - Special, unique, unusual, or super ordinary habitats or conditions within the vicinity of the site that may attract vertebrate wildlife. Lotic systems include small perennial or seasonal creeks to major rivers. Lentic systems include stock ponds to lakes. Multiple categories may be checked.

Vegetation/Habitat - Unique or exceptionally diverse vegetation or habitat in the vicinity may indicate exceptional diversity and abundance of avian species or bats.

Significant Ecological Event - Special, unique, unusual, or super ordinary events that occur or are suspected to occur in the vicinity of the site, *e.g.*, up to one third of the Continental population of Trumpeter Swans visit Ennis Lake, < 4 km from a proposed Wind Resource Area; the Continental migration of shorebirds passes over (many stop) @ Benton Lake National Wildlife Refuge) and up to 2000 golden eagles pass over the Bridger Mountains in autumn. If unknown but suspected a “?” is entered. Specifics regarding the cell are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up investigation and assist in definition of study objectives.

Site of Special Conservation Status - Any existing or proposed covenants, conservation easements, or other land development limitations intended to conserve, protect, or enhance wildlife or habitat. This criterion is weighted (2 entered if true) because of previous financial or other investment in ecological values. Specifics regarding the easement are then addressed in the appropriate box of the SITE SPECIFIC COMMENTS sheet to focus follow-up attention.

POTENTIAL IMPACT INDEX

Checklist (p) ¹	Site							
	Rugby		Audubon NWR					
	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p	Σ	Σ/p
Physical (36 boxes = 36/131 = 0.28)	14	50	15	54				
Species Occurrence & Status (78 boxes = 78 / 131 = 0.59)	43	73	50	85				
Ecological (17 boxes = 17 / 131 = 0.13)	7	54	10	77				
Totals		177		216				

¹Proportion of total (131) checklist scores.

SITE SPECIFIC COMMENTS

Checklist	Site	
	Rugby	Audubon NWR
Physical	Rolling hills with numerous wetlands and waterbodies	Some rolling hills around NWR, wetlands, bay of Lake Sac.
	Although migration occurs through project area, not likely to be funneled due to continuation of general habitat over larger area	Location adjacent to Missouri River. Likely funnels migrants
	No definite “mountain aspect” for area so new category of “topographic diversity” added to account for the many hills and wetlands in the area.	
Species Occurrence	Native habitats and wetlands result in the possibility of numerous species.	Several federally protected species present or possible.
Ecological	Native habitats and wetlands	Missouri River is a migration route for many species
		The presence of the Missouri River and Lake Sakakawea provides an ecological magnet

APPENDIX C.4

Letter from WEST Regarding Stick Nest in T157N, R72W, Section 1



Western EcoSystems Technology, Inc. 2003 Central Ave., Cheyenne, WY 82001
Phone: 307.634.1756 Fax: 307.637.6981 Web site: www.west-inc.com

June 3, 2005

Sarah Emery
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416-1518

Ms. Emery,

During a site visit to the proposed PPM Rugby Wind Farm on November 22, 2004, a potential bald eagle nest was located in T157N, R72W, Sec. 1. Because of the time of year (late fall), species occupancy could not be determined. We were asked to revisit the site during the spring 2005 to confirm species occupancy and activity. WEST biologists visited the potential bald eagle nest several times this spring during sharp-tailed grouse lek surveys and avian point counts. The nest contained a Canada goose this year, and not a bald eagle or other raptor.

If you would like further details please do not hesitate to contact me.

Sincerely,

Clayton Derby
Project Manager

APPENDIX C.5

Draft Protocol Outline for Pre- and Post-Construction Biological Monitoring at the Rugby Wind Farm, Rugby, North Dakota

Draft Protocol Outline for Pre- and Post-Construction Biological Monitoring at the Rugby Wind Farm, Rugby, North Dakota

March 3, 2005

This draft protocol outline is designed to evaluate several potential biological issues related to the proposed PPM Rugby Wind Farm located north of Rugby, North Dakota. This protocol outline focuses on four main areas: sharp-tailed grouse, grassland breeding birds, large bird and migratory bird monitoring, and post construction fatality monitoring. The tasks outlined in this document are being conducted voluntarily by PPM. PPM proposed to also conduct annual meetings and discussions with the USFWS and NDGFD to review the biological monitoring activities. Any changes to the scope and/or budget will require approval from PPM.

I. SHARP-TAILED GROUSE LEK SURVEYS

A. Purpose

- 1) Document sharp-tailed lek locations and numbers of birds attending the leks within the wind resource area, pre- and post-construction

B. Methods

Public roads and roads in which access can be gained (i.e., leased areas) will be driven from ½-hour before sunrise to one-hour after sunrise. Surveyors will stop for a minimum of 5 minutes every ½ mile to listen and look for strutting grouse. If a lek is located, the surveyor will map the location and record the number of males, females, and unknown birds attending the lek. Other information related to weather conditions, vegetation/ topography descriptions, etc. will also be recorded.

All roads will be driven twice each survey year between April 1 and May 15. The survey will be conducted one time before construction and one time after construction.

If large blocks of land are inaccessible due to lack of roads, a fixed-wing aircraft may be used to survey the area. Studies have shown that surveys from fixed-wing aircraft and helicopters are capable of a large percentage of leks. These types of surveys are not anticipated at this time.

Surveyors will recheck historic sharp-tailed grouse lek locations if any are available.

C. Design

Surveyors will attempt to completely cover all accessible roads in the wind farm area during both the pre- and post-construction efforts. The study will utilize reference information collected by state and federal agencies and others, as available, to help infer wind farm impacts as opposed to population or regional impacts outside the wind farm

Vegetation and landscape features will be obtained from the USFWS and utilized in the analysis of lek locations.

D. Deliverables

An interim letter report will be provided to PPM identifying number of leks location and locations by May 31, 2005 (pre-construction) so that information can be incorporated into facility siting.

A full report summarizing the survey methods, results, etc. will be completed by July 1 of each survey year. This report will contain number and location of leks located, number and location of historic leks visited, number of birds attending each lek, and GIS maps identifying vegetation and landscape features (as available) at each lek.

II. STUDY OF BREEDING BIRD PRESENCE, HABITAT USE, AND DISPLACEMENT

A. Purpose

- 1) Document species use of wind farm area.
- 2) Investigate disturbance and/or displacement of breeding birds at the wind farm level
- 3) Obtain some information on disturbance and/or displacement of breeding birds from individual turbines or turbine strings.

B. Methods

A line transect method will be used for this study. Surveyors will slowly walk along pre-determined transects and record all birds that are observed or heard within 50 meters either side of the transect line. Surveyors will record observations by 50 meter segments along each transect. The “block” for which birds are recorded by will be 50 meters long (as the surveyor moves along the transect) by 100 meters wide (50 meters either side of the transect).

Transects will be established, relocated, and followed using markers and GPS units. Each transect will be 800 meters long and will include 16 “blocks”. General habitat categories will be developed and each 50-meter block will be categorized by habitat type. Before/After Control Impact and Gradient Analyses will be conducted.

Raptor and other large birds (e.g., waterfowl, waterbirds) will also be recorded during the survey beyond the 50 m survey area (this is during the breeding season).

C. Design

1. Investigations at wind farm level

Transects will be established in areas planned for construction, as well as a reference area(s) not planned for development. A systematic sample with a random starting point will be used to locate transects allowing inference to the entire study area. Transects will be established at a density of approximately 1 transect per 100-200 acres inside the area leased for wind development (i.e., not the entire wind resource area). Similar transects will be established in a reference area(s), such as WPA’s. Each transect will be surveyed three times annually during the breeding season (typically once in May, June and July), with specific dates to be determined in consultation with NDGFD and USFWS. Surveys will be conducted from sunrise to 10:00 a.m. Surveys will begin one year prior to development and will continue for one year post-construction. All species observed by sight or sound will be recorded during each survey so that a species list by survey period, year, and area can be developed.

The study design, which includes recording observations continually along the transects, will facilitate development of species density estimates as well as location/habitat use information that can be analyzed between survey dates, years, location, etc.

2. Investigations at Turbine or Turbine String Level

Detailed engineering design has not been completed for the wind farm, and the precise locations of turbines and or turbine strings are not currently known. However, because bird survey data will be collected continuously along line transects prior to and following construction and there is a high density of transects, data can be post-stratified based on actual turbine and turbine string locations. For example, if a turbine string crosses through “block 7” of a particular transect, data could be analyzed to investigate impacts within block 7 and the successive blocks extending away from the turbine string.

D. Deliverables

An interim letter report identifying transects or areas of exceptionally high breeding bird use will be provided to PPM by July 1, 2005 (pre-construction). This will include information from the first two survey efforts, but may not include information from the final pre-construction survey. This information will be provided to allow it to be considered by PPM in the facility siting.

A report discussing the survey methods and results will be completed by December 15 of each year. This report will also contain analyses of data to evaluate between years, transects, etc. The reference transect will provide a control for comparison purposes.

III. DIURNAL LARGE BIRD USE MONITORING DURING MIGRATORY PERIODS

A. Purpose

- 1) To document species use of the project area and compare to other existing facilities with estimated fatality rates.
- 2) To identify portions of the wind farm area that receive disproportionate use.

B. Methods and Design

Observation stations will be established throughout the wind farm area. Each station will be visited weekly during the spring and fall migration periods (roughly April 1 - May 1 and October 1 – November 15). This would result in 10-11 survey periods per year. At each point, observers will spend ½ hour conducting 360° visual scans for raptors and waterfowl. While this effort is best suited for raptors and other large birds, all birds observed will be record. In this way some level of inference can be gained regarding other migratory bird use as well as raptors and waterfowl. The species, numbers, time, location, behavior, and flight direction and height will be documented for all species observed.

A total of 20 observation stations will be established in the wind farm area such that the stations are evenly spaced. Surveys will be conducted during daylight hours.

C. Deliverables

An interim letter report discussing areas of exceptionally high migratory bird use identified during the spring season will be provided to PPM by July 1, 2005. This information will be provided to allow it to be considered by PPM in the facility siting.

A report describing the survey methods and results will be completed by December 15 each survey year. This report will identify portions of the wind farm that appear to receive disproportional use by raptors, waterfowl, and other species. The survey will begin in spring 2005 and continue for one year post-construction.

IV. RAPTOR NEST MONITORING

A. Purpose

- 1) To document raptor nest numbers and locations in the project area.

B. Methods and Design

The USFWS recommended that a potential bald eagle nest in the project area be checked the spring prior to construction to confirm species and occupancy. This check will be conducted from a county road near the nest location.

Biologists will record all raptor nests, species, and activity during other survey efforts (e.g., sharp-tailed lek surveys, breeding bird surveys, etc.). No specific raptor nest survey effort will be conducted.

C. Deliverable

An interim letter report identifying the species and occupancy of the potential bald eagle nest will be provided to PPM within one week after the nest is checked. This information will be provided to allow it to be considered by PPM in the facility siting.

A report and maps identifying nest locations, species, and activity will be completed by July 1 each year. Verbal and or letter reports may be developed as needed.

V. POST-CONSTRUCTION MONITORING OF AVIAN AND BAT MORTALITY

A. Purpose

- 1) To document bird and bat fatalities at the developed wind farm by species.
- 2) To estimate annual avian and bat fatalities attributable to the wind farm.
- 3) To evaluate spatial and temporal patterns of fatalities.

B. Methods and Design

Fatality monitoring will begin once all turbines are constructed and commercially operational (i.e., after testing). All turbines and met towers will be searched once every 28 days between March 1 and October 31 a minimum of one year post-construction. While all turbines and met towers will be searched, a sample of the area under each structure will be searched. For example, instead of walking transects 6 m apart for complete coverage, transects will be walked 12 m apart to sample half the area under the structure. The actual search area will be based upon turbine height.

A sub-sample of 10 turbines will also be searched during two five day periods (i.e., work days of two weeks) in the spring and fall migration periods. These intensive survey time frames will be set based on the peak migration periods. The two five day periods do not have to be concurrent. The complete area under the selected turbines will be surveyed during these intensive efforts.

All fatalities documented will be attributed to the wind farm (i.e., no reference area will be searched) unless another cause is determined (e.g., gunshot). Carcass removal trials will be conducted to determine removal times, and survey intervals may be adjusted depending on the results of the initial carcass removal trials. Searcher efficiency trials will also be conducted to determine the “findability” rate of carcasses of varying size. Incidental observations will be recorded during the life of the project.

C. Deliverables

A report will be prepared that documents survey results, including species and number found, dates of mortality, turbines associated with mortality, and an assessment of turbines and/or turbine strings that cause disproportionate rates of mortality. The report will be submitted by December 31 after surveys are conducted.

APPENDIX C.6

Class I Cultural Resources Inventory

To: Tim Seck (PPM Energy)	
From: Michael Madson	Project: PPM Rugby Wind Farm
CC: Angela Piner and Sarah Emery (HDR)	
Date: June 15, 2005	Job No: 9624

RE: Rugby Wind Farm Cultural Resources Literature Review

This memorandum documents the cultural resources data collection (Class I Inventory) for the proposed Rugby Wind Farm project. HDR Engineering, Inc. (HDR) initiated this data collection in 2004 to assist PPM Energy, Inc. (PPM) in project planning. The known cultural resources information, derived from previous professional cultural resources surveys and reported site leads, was on file at the State Historic Preservation Office (SHPO) in Bismarck, North Dakota. In February 2005, HDR reviewed the information on file at the SHPO again to ensure that data relevant to the Rugby Wind Farm project and associated transmission line was current. Collected data includes archaeological site files and previous cultural resources studies and reports. In addition, HDR reviewed 19th-century Public Land Survey (PLS) maps to identify potential historic-period cultural features that may yet exist in the project area.

Cultural Resources Reports and Sites

HDR reviewed existing cultural resources documentation for the following townships, all of which are in Pierce County, North Dakota, and comprise the Rugby Wind Farm project area (Table 1). The project area is in turn comprised of three distinct elements: the Rugby Wind Farm Site, the Transmission Corridor, and the Transmission Route.

Table 1. Project Area (Rugby Wind Farm Site, Transmission Corridor, and Transmission Route).

Township Name	Township	Range	Section
Meyer	156N	72W	3-10
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-17, 20-29, 32-36
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

The Class I inventory documented 14 previous cultural resources investigations in the project area and vicinity. These reports illustrate the wide variety of investigations in the area, including those conducted in support of transmission line construction, borrow sources for road construction, roadway upgrades, and water routing and treatment facilities. In summary, these studies include: one previous investigation of portions of the Rugby Wind Farm Site; four of portions of or within one mile of the Transmission Corridor and the Transmission Route; five of the combined Rugby Wind Farm Site, Transmission Corridor, and Transmission Route; and four investigations in the immediate vicinity but outside of these areas (Table 2).

Table 2. Previous Cultural Resources Investigations in the Project Area and Vicinity.

Survey Report Date	Report Title	Author(s)/Association	Comment	Project Component
1975	<i>Report of the Archaeological and Historic Site Reconnaissance Survey of Project No. F-3-002-211, Rugby to Leeds, Pierce and Benson Counties</i>	Nick G. Franke/State Historical Society of North Dakota	Southern terminus of Transmission Corridor and Transmission Route project areas	Transmission Corridor/Transmission Route
1988	<i>The Rugby Historic Sites Inventory Project, North Dakota Cultural Resources Survey 1987-1988</i>	Susan Granger and Scott Kelly/Gemini Research	West of project area	Within one mile of the Transmission Corridor/Transmission Route
1990	<i>Des Lacs-Souris Drainage Basin Erosion Control Study Area Cultural Resources Review, Part 1: Prehistoric Cultural Resources Overview</i>	Michael L. Gregg and Paul R. Picha/University of North Dakota	Regional overview	Wind Farm Project Site/Transmission Corridor/Transmission Route
1995	<i>NH-3-002(040)212 Cultural Resource Field Review</i>	Robert C. Christensen/North Dakota Department of Transportation	South and east of project area	N/A
1996	<i>Cultural Resource Inventory Report for the Rugby Water Supply and Treatment Plant Improvement, Phase II, Souris River Study Unit</i>	Sarah J. Rothwell/LTA	East of project area	N/A
1999	<i>Otter Tail Company's 230kV Harvey/Rolla Transmission Line: A Class III Cultural Resources Inventory of Selected Segments in Wells, Pierce, and Rolette Counties, North Dakota</i>	Byron L. Olson/Powers Elevation Co. Inc.	South and north of project area	N/A
2000	<i>Addendum to: Otter Tail Company's 230kV Harvey/Rolla Transmission Line: A Class III Cultural Resources Inventory of Selected Segments in Wells, Pierce, and Rolette Counties, North Dakota</i>	Byron L. Olson/Bilcatt Archaeology, Inc.	Pedestrian survey in: Sections 23 and 26 (Spring Lake)	Wind Farm Project Site
2000	<i>Wrought Iron Cross Cemeteries in North Dakota-Continuing Survey, 1998-99</i>	Thomas D. Isern and Kevin Nesemeier/North Dakota State University Institute for Regional Studies	Little Flower Cemetery (32PI33) in Section 6 (Meyer) west of project area	Within one mile of the Transmission Corridor/Transmission Route
2001	<i>Otter Tail Company's 230kV Harvey/Rolla Transmission Line: Class III Cultural Resource Inventory of Selected Segments of Reroute Alternate #5, Pierce County, ND</i>	Byron L. Olson/Bilcatt Archaeology, Inc.	Section 4 (Torgerson); 1, 13-16, 21, 28, and 33 (Spring Lake); one possible prehistoric cairn (32PIX78) in Section 13 (Spring Lake)	Site 32PIX78 (only Wind Farm Project Site); Wind Farm Project Site /Transmission Corridor/Transmission Route
2001	<i>Highway 2 Rugby to Knox: A Class III Cultural Resources Inventory in Pierce and Benson Counties, North Dakota</i>	Ed Stine/Hemisphere Field Services	Southern terminus of project area	Transmission Corridor/Transmission Route
2002	<i>NDSHPO Ref #00-0044, Kraft Stone Circle Site</i>	John G. Morrison/Metcalf Archaeological Consultants, Inc.	Stone circles (32PI53) in Section 15 (Spring Lake)	Wind Farm Project Site; within one mile of the Transmission Corridor/Transmission Route
2002	<i>Brossart Gravel Pit: A Cultural Resource Inventory in Pierce County, North Dakota</i>	Ed Stine/ Metcalf Archaeological Consultants, Inc.	Reported stone circle (32PIX32) in Section 31 (Spring Lake);	Wind Farm Project Site; within one mile of the Transmission

Table 2. Previous Cultural Resources Investigations in the Project Area and Vicinity.

Survey Report Date	Report Title	Author(s)/Association	Comment	Project Component
			Section 36 (Walsh)	Corridor/Transmission Route
2004	<i>A Cultural Resource Inventory of Structure Replacement, Rugby-Devil's Lake 115 kV Transmission Line, Benson, Ramsey, and Pierce Counties, North Dakota</i>	Joseph Giliberti/Western Area Power Administration	South and east of the project area	N/A
2004	<i>ROW-046/073, Class III Inventory Report</i>	Bob Christensen/North Dakota Department of Transportation	East of project area	N/A

Previous investigations in the project area documented three prehistoric archaeological resources, namely two site leads and one archaeological site (Table 3). The three resources are within the Rugby Wind Farm Site. There are no archaeological resources within the Transmission Corridor and no archaeological resources along the Transmission Route; however, two resources are within one mile of the Transmission Corridor and no resources are within one mile of the Transmission Route.

Table 3. Previously Identified Archaeological Resources in the Wind Farm Project Area.

Site Number	Site Type	Comment
32PIX32	Reported stone circle	Exact location unknown (reported site); not identified by Stine (2002)
32PIX78	Possible cairn	Identified by Olson (2001)
32PI53	Stone circles	Identified by Morrison (2002)

The following paragraphs, organized by project component(s), describe the nature of these investigations and identified resources.

Rugby Wind Farm Site (1 report)

Olson (2000) documented a Class III survey for the proposed 230 kV Ottertail transmission line project. The 2000 survey included portions of the Rugby Wind Farm Site, namely in Sections 23 and 26 of Spring Lake Township, as well as multiple individual linear segments or segment groups in neighboring townships. No archaeological resources were identified during survey within the Rugby Wind Farm Site (Olson 2000).

Transmission Corridor and Transmission Route (4 reports)

Franke (1975) completed a survey of a portion of U.S. Highway 2 that included the southern terminus of the Transmission Corridor and Transmission Route. The survey was conducted from approximately one mile east of the junction of Highway 2 and 3 at Rugby, North Dakota and east to the west edge of Leeds, North Dakota. During the survey, one historic-period artifact scatter was noted southeast of the Transmission Corridor and Transmission Route.

Granger and Kelly (1988) performed a historic standing structure inventory of Rugby, North Dakota. These structures are west of the proposed Transmission Corridor and Transmission Route. Granger and Kelly (1988) documented and evaluated 274 structures within the report; 106 structures and two possible historic districts were identified as requiring further investigation.

Isern and Nesemeier (2000) inventoried 72 wrought iron cross cemeteries in 24 counties in North Dakota. The crosses represent folk art and the material culture of the North American Plains. One cemetery, the

Little Flower Cemetery (32PI133) is in Section 6 of Meyer Township, immediately west of the Transmission Corridor and 0.75 mile west of the Transmission Route.

Stine (2001) documented a Class III survey of proposed road improvements on U.S. Highway 2, between Rugby and Knox, North Dakota. A portion of the surveyed area included the southern terminus of the Transmission Corridor and Transmission Route in Meyer Township. No cultural resources were identified.

Rugby Wind Farm Project Site, Transmission Corridor, Transmission Route (5 reports)

Gregg and Picha (1990) completed an overview for the Des Lacs-Souris Drainage Basin Erosion Control project for the McKenzie Water District of the Custer National Forest. The review area included broad areas of north-central and northwestern North Dakota, including the entire Rugby Wind Farm Site, Transmission Corridor, and Transmission Route. No fieldwork was conducted for the report; however, it contains an extensive prehistoric context for the region.

Olson (1999, 2001) documented Class III surveys for the proposed 230 kV Ottertail transmission line project. The 2001 survey (as well as the 2000 survey, also by Olson, mentioned above) included portions of the project area, as well as multiple individual linear segments or segment groups in neighboring townships. Two prehistoric archaeological sites were identified during the 1999 survey, although these sites are not within the project area. During the 2001 survey, Olson identified one archaeological site lead, a possible cairn 32PIX78, that is in Section 13 of Spring Lake Township, within the Rugby Wind Farm Site. The possible cairn is a cluster of seven glacial cobbles near the top of a rise overlooking a kettle pond. Olson (2001) reported that there were scattered surface erratics at the time of the survey in the vicinity, although they were not clustered; Olson (2001) noted the uncertainty regarding whether the possible cairn was indeed a cultural resource. No additional investigation at the site lead location was completed.

At the request of a land owner and Otter Tail Power Company, Morrison (2002) recorded 32PI53, two stone circles in Section 15 of Spring Lake Township. The stone circles are on separate ridges overlooking lakes, marshlands and drainages. One stone circle is comprised of 10 to 15 stones and measures approximately 2.5 meters in diameter. A second circle is directly east of the first and is within a saddle between two rises. This circle contains 15-20 stones and measures 3.5 meters in diameter. The site was avoided during construction of the Otter Tail Power Company transmission line; no additional investigation of the site occurred. The eligibility of 32PI53 for listing on the National Register of Historic Places has not been determined. The archaeological site is within the Rugby Wind Farm Site and within one mile of the Transmission Corridor.

Stine (2002) also completed a Class III cultural resource inventory for proposed expansion of a borrow area for the North Dakota Department of Transportation. The survey was completed prior to the expansion of an existing gravel pit in Section 31 of Spring Lake Township and Section 36 of Walsh Township. A site lead, 32PIX32, was previously noted in Section 31, however, the site, a stone circle, was not identified by Stine (2002) during the survey. The site lead is within the Wind Farm Project Site, and within one mile of the Transmission Corridor.

Immediate Vicinity (4 Reports)

Christensen (1995) reported on the North Dakota Department of Transportation's pedestrian survey of selected areas along Highway 2. All surveyed areas were south and southeast of the Rugby Wind Farm project areas. One archaeological site was identified during the survey approximately nine miles southeast of the project areas.

Rothwell (1996) completed an archaeological resource survey for proposed additions to the City of Rugby water system east of the project area. No cultural resources were identified.

Christensen (2004) reported on a Class III inventory for probable development of a parcel north of Highway 2 and east of the project area. No cultural resources were identified during the survey.

Finally, Giliberti (2004) of the Western Area Power Administration completed a cultural resource inventory of the Rugby to Devil's Lake 115kV transmission line. The project involved the replacement of H-frame transmission line structures along an alignment south of the project area. No cultural resources were noted during the survey.

Public Land Survey Map Review

HDR reviewed PLS maps for the project areas (Table 4). The maps illustrate environmental conditions, including elevation variations across the landscape and watercourses, during the early 1880s. The maps indicate intensive historic-period land use south, east, and west of the project area, including active farmsteads, cultivated acreage, wagon roads, and a railroad alignment. In addition, the Mouse River Wagon Road is shown through the transmission line project area.

Table 4. Public Land Survey Map Data.

Township Name	Township	Range	Public Land Survey Dates	Cultural Features/Location
Meyer	156N	72W	1883-1887	St. Paul, Minneapolis, and Manitoba Railroad alignment; road/trail alignment; farmsteads and cultivated acreage (In sections 1-5)
Tofte	157N	71W	1883-1884	Road/trail alignment (probable Mouse River Wagon Road in sections 31-33)
Torgerson	157N	72W	1883-1884	Mouse River Wagon Road in sections 19-21, 25-28
Walsh	157N	73W	1883-1884	Mouse River (Wagon) Road in sections 24-28, 31-33
Juanita	158N	71W	1883-1884	None
Spring Lake	158N	72W	1883-1884	None
East Barton	158N	73W	1883-1884	None

SHPO Correspondence (see attached)

HDR wrote Mr. Paul Picha at the SHPO in December 2004 to request a review of potential project-related impacts on known or suspected cultural resources. The SHPO responded with a request for additional information in order to determine the Area of Potential Effects (APE) and any project impacts in the APE. The SHPO recommended that PPM sponsor a Class I cultural resources inventory for the site to determine the nature of previous cultural resources investigations and the location of known archaeological sites in the project site. The SHPO response letter stated that there is "potential for unrecorded properties in a variety of physiographic settings in the...project area". Therefore, the SHPO suggested that a Class III cultural resources inventory, primarily pedestrian survey, might be appropriate. During a meeting with Mr. Picha on May 5, 2005, HDR Archaeologist Michael Madson reviewed the project information at that time. Mr. Madson reported to Mr. Picha that PPM was planning to conduct a field inventory (Class III) of the impact areas once the project footprint was better defined and seasonal land use cycles allowed for cleared agricultural fields. Mr. Picha shared additional background materials with Mr. Madson that would assist during site identification during the field inventory and recommended communication with Mr. William Ambrose Littleghost of the Spirit Lake Nation (see below).

Tribal Correspondence

HDR contacted cultural resources representatives at the Turtle Mountain Band of Chippewa (Mr. Brady Grant) and the Spirit Lake Nation (Mr. Williams Ambrose Littleghost) for their input. Letters were sent to these representatives in February and June, 2005 respectively. We have not received a response as of the date of this memorandum.

Implications for Archaeological Resources

After review of the recorded archaeological site information, the information in previous survey reports, and communication with Mr. Picha of the SHPO, HDR believes that the project area has a relatively high potential for prehistoric archaeological resources, particularly on elevated landforms that have escaped cultivation, such as the area around the prehistoric stone circles at 32PI53. A potential for significant historic-period archaeological resources appears to be small, although the intersection of the transmission line project area and former alignment of the Mouse River Wagon Road may have archaeological materials related to use of the alignment.

Conclusions

HDR recommends a Class III archaeological resources survey for areas proposed for construction of the transmission line, wind turbines, and associated access roads and other elements. These investigations must be conducted by a professional archeologist permitted by the State of North Dakota per NDCC 55-03-01. The nature of the archaeological resources survey would depend on surface exposure and the characteristics of the landform proposed for development. The proposed Transmission Route will be surveyed for archaeological resources. In addition, HDR recommends that, once the Rugby Wind Farm Site construction plan reaches a more definite stages of development, the plan will be communicated to Mr. Picha (SHPO), Mr. Grant (Turtle Mountain Band of Chippewa), and Mr. Littleghost (Spirit Lake Nation). For both surveys, HDR archaeologists will design a survey methodology to document the areas proposed for ground disturbance, identify existing archaeological resources within those areas, provide recommendations for National Register eligibility, and offer recommendations for archaeological site avoidance, impact minimization, or mitigation if necessary.

December 6, 2004

Mr. Paul Picha
North Dakota State Historic Preservation Office
612 East Boulevard Avenue
Bismarck, ND 58505-0830

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Picha:

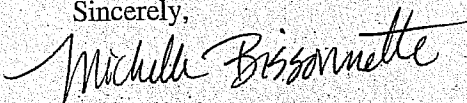
HDR Engineering, Inc. (HDR) requests your office review of the Rugby Wind Farm for possible effects to known or potential sites of archaeological or historic significance. The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined. It is unknown whether any federal permits will be required for this project. If it appears that the project will require federal involvement, then our office will notify you.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
157 N	71 W	5-8
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Enclosed is map detailing the proposed location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call me at (763) 278-5910, or Mike Madson at (763) 278-5921. Thank you for your assistance.

Sincerely,



Michelle Bissonnette
Project Manager



Michael Madson
Senior Archaeologist

Enclosure: Project Location Map

cc: Mr. Tim Seck, PPM Energy, Inc.
HDR Engineering, Inc.

6190 Golden Hills Drive
Minneapolis, MN 55416

Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com



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HISTORICAL
SOCIETY
OF NORTH DAKOTA**

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DEC 13 2004

HDR Engineering, Inc.

John Hoeven
Governor of North Dakota

December 9, 2004

North Dakota
State Historical Board

Michelle Bissonnette
Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Diane K. Larson
Bismarck - President

Marvin L. Kaiser
Williston - Vice President

**NDSHPO Ref.: 05-0240 HDR/PPM Energy, Inc. 150 MW Rugby Wind Farm,
Pierce County, North Dakota**

Albert I. Berger
Grand Forks - Secretary

Dear Michelle:

Chester E. Nelson, Jr.
Bismarck

We have reviewed the information on the proposed 150 MW Rugby Wind Farm, Pierce County, North Dakota, in your letter of December 6. Given the size of the project area, additional information will be needed before the Area of Potential Effect (APE) can be determined. We recommend that a Class I CRI (file search) be completed for areas that may be impacted by the project. There also is potential for unrecorded properties in a variety of physiographic settings in the Pierce County project area (see enclosure). A Class III CRI (pedestrian survey) may be warranted once more detailed information on project particulars (scale and scope of structures, utility corridors, access roads, etc.) becomes known.

Gereld Gerntholz
Valley City

A. Ruric Todd III
Jamestown

Also, if the project crosses lands administered by a federal agency, then the agency must be consulted regarding their recommendations on the project.

Sara Otte Coleman
*Director
Tourism Division*

We look forward to working with you as this project develops. If you have questions please contact either Duane Klinner at (701) 328-3576 or Paul Picha at (701) 328-3574.

Kathi Gilmore
State Treasurer

Alvin A. Jaeger
Secretary of State

Douglass Prchal
*Director
Parks and Recreation
Department*

Sincerely,

Merlan E. Paaverud, Jr.
Director, State Historical Society of North Dakota
and
State Historic Preservation Officer
(North Dakota)

enc.: File list for T157-158N, R71-72W, Pierce County, North Dakota

David A. Sprynczynatyk
*Director
Department of Transportation*

John E. Von Rueden
Bismarck

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Page 1 of 1

TOWNSHIP: 157 RANGE: 072 SECTION: 09
MANUSCRIPT_NO:005036 YEAR: 1990

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AUTHOR(s): Gregg, M. P. Picha

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AUTHOR(s): Olson, B.

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AUTHOR(s): Gregg, M. P. Picha

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MANUSCRIPT_NO:005036 YEAR: 1990
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AUTHOR(s): Gregg, M. P. Picha

TOWNSHIP: 158 RANGE: 071 SECTION: 13
MANUSCRIPT_NO:006090 YEAR: 1993
TITLE: Cultural Resources Survey Report Class III Cultural Resource Inventory Item No. 1, Ten Microwave Repeater Sites, ND
AUTHOR(s): Martorano, M. T. Anderson

TOWNSHIP: 158 RANGE: 072 SECTION: 13
MANUSCRIPT_NO:007660 YEAR: 2000
TITLE: Addendum To: Ottertail Company's 230 kV Harvey/Rolla Transmission Line Cultural Resources Inventory, Wells, Pierce, and Rolette Counties, ND
AUTHOR(s): Olson, B.

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AUTHOR(s): Olson, B.

TOWNSHIP: 158 RANGE: 072 SECTION: 15
MANUSCRIPT_NO:008285 YEAR: 2002
TITLE: Kraft Stone Circle Site, Pierce Co., ND
AUTHOR(s): Morrison, J.

TOWNSHIP: 158 RANGE: 072 SECTION: 31
MANUSCRIPT_NO:008412 YEAR: 2002
TITLE: Brossart Gravel Pit: A Class III Cultural Resource Inventory in Pierce Co., ND
AUTHOR(s): Stine, E.

Legals Search

<i>County</i>	<i>Site</i>	<i>Township</i>	<i>Range</i>	<i>Section</i>	<i>Area/Sig1</i>	<i>StateRegistry</i>	<i>NationalRegistry</i>
PI	X0083	157	071	23	Archeological		
PI	00047	157	072	31	Architectural		
PI	00503	157	072	31	Architectural		
PI	00504	157	072	31	Architectural		
PI	00505	157	072	31	Architectural		
PI	00506	157	072	31	Architectural		
PI	00507	157	072	31	Architectural		
PI	00508	157	072	31	Architectural		
PI	00509	157	072	31	Architectural		
PI	00510	157	072	31	Architectural		
PI	00532	157	072	31	Architectural		
PI	00533	157	072	31	Architectural		
PI	00542	157	072	31	Architectural		
PI	00551	157	072	31	Architectural		
PI	00552	157	072	31	Architectural		
PI	00557	157	072	31	Architectural		
PI	00559	157	072	31	Architectural		
PI	00561	157	072	31	Architectural		
PI	00562	157	072	31	Architectural		

<i>County</i>	<i>Site</i>	<i>Township</i>	<i>Range</i>	<i>Section</i>	<i>AreaSig1</i>	<i>StateRegistry</i>	<i>NationalRegistry</i>
P1	00564	157	072	31	Architectural		
P1	00565	157	072	31	Architectural		
P1	00641	157	072	31	Architectural		
P1	00699	157	072	31	Architectural		
P1	00700	157	072	31	Architectural		
P1	00553	157	072	32	Architectural		
P1	00563	157	072	32	Architectural		
P1	X0030	158	071	03	Historical		
P1	00018	158	071	13	Archeological		
P1	X0031	158	071	23	Historical		
P1	X0078	158	072	13	Archeological		
P1	00053	158	072	15	Archeological		
P1	X0032	158	072	31	Archeological		

APPENDIX D

Agency Letters

December 3, 2004

Mr. Dean Hildebrand
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

RE: Rugby Wind Farm, Pierce County, North Dakota.

Dear Mr. Hildebrand:

HDR Engineering, Inc. requests your review of the above-mentioned project for potential effects to known federally-listed threatened or endangered species and rare natural features.

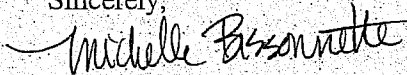
The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
157 N	71 W	5-8
157 N	72 W	1-12
158 N	71 W	7-8, 17-20, 29-32
158 N	72 W	7-36

Enclosed is map detailing the location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

Sincerely,



Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Steve Dyke, North Dakota Game and Fish Department
Mr. Tim Seck, PPM Energy, Inc.

December 3, 2004

Ms. Kathy Duttonhefner
ND Natural Heritage Inventory
North Dakota Parks & Recreation Department
1600 East Century Avenue
Bismarck, ND 58503-0649

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Duttonhefner:

HDR Engineering, Inc. requests a database review for the above-mentioned project. The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

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Enclosed is map detailing the proposed location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

Sincerely,



Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Tim Seck, PPM Energy, Inc.

December 3, 2004

Mr. Terry Ellsworth
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Ellsworth:

HDR Engineering, Inc. appreciates your and Mr. Albright's input on siting this proposed wind project. Please review the Rugby Wind Farm project for potential effects to known federally-listed threatened or endangered species and rare natural features. This request is made pursuant to Section 7 of the Endangered Species Act of 1973, as amended. In addition, please review this project in relation to the USFWS refuge system, including Waterfowl Protection Areas and easements.

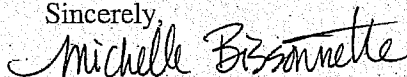
The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

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Enclosed is map detailing the location of the Rugby Wind Farm site location to facilitate your review. If you require further information or have questions regarding this matter, please call Michelle Bissonnette at (763) 278-5910. Thank you for your assistance.

Sincerely,



Michelle Bissonnette
Project Manager

Enclosure: Project Location Map

cc: Mr. Lee Albright, US Fish and Wildlife Service
Mr. Tim Seck, PPM Energy

HDR Engineering, Inc.

6190 Golden Hills Drive
Minneapolis, MN 55416

Phone: (763) 591-5400
Fax: (763) 591-5413
www.hdrinc.com

December 6, 2004

Mr. Paul Picha
North Dakota State Historic Preservation Office
612 East Boulevard Avenue
Bismarck, ND 58505-0830

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Picha:

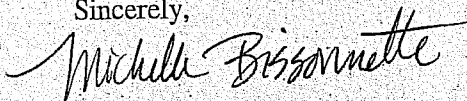
HDR Engineering, Inc. (HDR) requests your office review of the Rugby Wind Farm for possible effects to known or potential sites of archaeological or historic significance. The proposed project is a 100 to 150 MW wind farm in Pierce County, located north of the city of Rugby, North Dakota. Currently the project plans to use approximately 67 to 100 1.5-MW turbines, although that may change as turbine technology advances. The exact turbine locations have not been determined. It is unknown whether any federal permits will be required for this project. If it appears that the project will require federal involvement, then our office will notify you.

The proposed project is located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township	Range	Sections
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Michelle Bissonnette
Project Manager



Michael Madson
Senior Archaeologist

Enclosure: Project Location Map

cc: Mr. Tim Seck, PPM Energy, Inc.
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6190 Golden Hills Drive
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Accredited by the
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December 9, 2004

Michelle Bissonnette
Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

NDSHPO Ref.: 05-0240 HDR/PPM Energy, Inc. 150 MW Rugby Wind Farm,
Pierce County, North Dakota

Dear Michelle:

We have reviewed the information on the proposed 150 MW Rugby Wind Farm, Pierce County, North Dakota, in your letter of December 6. Given the size of the project area, additional information will be needed before the Area of Potential Effect (APE) can be determined. We recommend that a Class I CRI (file search) be completed for areas that may be impacted by the project. There also is potential for unrecorded properties in a variety of physiographic settings in the Pierce County project area (see enclosure). A Class III CRI (pedestrian survey) may be warranted once more detailed information on project particulars (scale and scope of structures, utility corridors, access roads, etc.) becomes known.

Also, if the project crosses lands administered by a federal agency, then the agency must be consulted regarding their recommendations on the project.

We look forward to working with you as this project develops. If you have questions please contact either Duane Klinner at (701) 328-3576 or Paul Picha at (701) 328-3574.

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Merlan E. Paaverud, Jr.
Director, State Historical Society of North Dakota
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enc.: File list for T157-158N, R71-72W, Pierce County, North Dakota

A & H P MANUSCRIPT REPORT

Date: 12/8/04

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PI	00557	157	072	31	Architectural		
PI	00559	157	072	31	Architectural		
PI	00561	157	072	31	Architectural		
PI	00562	157	072	31	Architectural		

<i>County</i>	<i>Site</i>	<i>Township</i>	<i>Range</i>	<i>Section</i>	<i>AreaSig1</i>	<i>StateRegistry</i>	<i>NationalRegistry</i>
PI	00564	157	072	31	Architectural		
PI	00565	157	072	31	Architectural		
PI	00641	157	072	31	Architectural		
PI	00699	157	072	31	Architectural		
PI	00700	157	072	31	Architectural		
PI	00553	157	072	32	Architectural		
PI	00563	157	072	32	Architectural		
PI	X0030	158	071	03	Historical		
PI	00018	158	071	13	Archeological		
PI	X0031	158	071	23	Historical		
PI	X0078	158	072	13	Archeological		
PI	00053	158	072	15	Archeological		
PI	X0032	158	072	31	Archeological		



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501



RECEIVED

JAN 12 2005

JAN 10 2005

HDR Engineering, Inc.

Ms. Michelle Bissonnette, Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, Minnesota 55416

Dear Ms. Bissonnette:

I am writing in response to your December 3, 2004, request for information on threatened and endangered species in relation to a proposed wind power project near Rugby, North Dakota. The proposed project includes construction of 67 to 100 1.5-MW wind turbines, access roads, and ancillary facilities. The proposed location for the wind power project is in Pierce County:

T. 157 N., R. 71 W., Sections 5-8

T. 157 N., R. 72 W., Sections 1-12

T. 158 N., R. 71 W., Sections 7, 8, 17-20; 29-32

T. 158 N., R. 72 W., Sections 7-36

In general, wildlife resources and issues that warrant consideration during project planning include: migratory birds (e.g., collisions and electrocutions); tribal, state or Federal land interests; wetlands, prairie, and woodland habitats; Clean Water Act - Section 404 activities; threatened and endangered species; ancillary facility development (e.g., roads, substations, underground cables, or overhead transmission lines); and monitoring, research, and assessment. Natural resources and issues that may be applicable to your project are further addressed below.

Migratory Birds

Adequate consideration to bird resources early in the site evaluation process can minimize impacts and facilitate project construction. Although current wind turbine technology minimizes the incidence of avian death due to blade and tower strikes, direct mortality of some migratory birds will continue to occur. The Fish and Wildlife Service (Service), under the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Act, the Endangered Species Act, and Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," is directed to protect migratory birds. The provisions of these Acts generally make it unlawful to take migratory birds. However, being responsive to Congressional and Presidential mandates, treaties, and legislation, wind power developers, in concert with the Service, can cooperatively ensure projects proceed in a positive manner. Together, we have a responsibility to scientifically

determine the factors in siting and operation of wind power plants that contribute to avian fatalities and to implement measures to minimize impacts to migratory birds.

To minimize the electrocution hazard to birds, the Service, with support from the Rural Utilities Service, recommends that new or updated overhead power lines be constructed in accordance with the current guidelines for preventing raptor electrocutions. The recommended guidelines can be found in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996". To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, the Service recommends power lines that cross or run adjacent to rivers or large wetlands be modified according to "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994". Both publications can be obtained by writing or calling the Edison Electric Institute, P.O. Box 266, Waldorf, Maryland, 20604-0266, (1-800-334-5453) or visiting their website at www.eei.org.

Research, Monitoring and Assessment

We encourage project proponents to conduct collision monitoring studies designed to determine the effect of several factors, such as site selection, turbine designs, the layout of wind plants, wind plant operations, habitat alteration, and changes in available perching and nesting sites on bird deaths. The Avian Subcommittee of the National Wind Coordinating Committee (NWCC) has developed a guidance document to assist wind energy developers in designing studies that will produce credible and comparable results of avian interaction with wind power plants. The NWCC document, "Studying Wind Energy/Bird Interactions: A Guidance Document. Metrics and methods for determining or monitoring potential impacts on birds at existing and proposed wind energy sites," can be obtained by contacting the National Wind Coordination Committee, c/o RESOLVE, 1255 23rd Street, Suite 275, Washington, D.C. 20037, or by visiting their website at www.nationalwind.org). The Service currently is compiling a list of research and monitoring issues related to wind power development in the Dakotas. We look forward to sharing these ideas with you and other industry representatives, and cooperatively developing a reasonable approach to acquisition of information that may help identify additional measures to minimize impacts to wildlife resources.

Fish and Wildlife Service Property Interests

As part of the National Wildlife Refuge System, the Service administers fee title Refuge and Waterfowl Production Areas, as well as wetland and grassland easements throughout North Dakota. Lee Albright, Wetland Manager, J. Clark Salyer National Wildlife Refuge, has provided HDR Engineering (HDR) with current Service property information for the proposed project area.

Wetland, Grassland, and Woodland Resources

The proposed project area is located in the Drift Prairie region of North Dakota and includes areas of native mixed-grass prairie. Since the 1800s, North Dakota has lost approximately 75-90 percent of its native grasslands primarily due to crop production.

Native prairie has significant natural resource values including:

- Provides habitat for a number of migratory grassland birds whose populations are declining.
- Provides nesting habitat for millions of waterfowl.
- Contains 200-300 plant species, which provide genetic diversity important to agriculture and medicine.
- Provides habitat for thousands of insects including the Dakota skipper, a candidate species, and other butterflies (Ex: Regal fritillary, Tawny crescent).
- Crucial for soil and water conservation.
- Provides recreational opportunities (hunting, bird watching/wildlife observation, hiking).
- Living laboratories for scientific research.

Our review of National Wetlands Inventory (NWI) maps indicates that wetland areas are located within the project area. NWI data can be accessed directly by visiting their website at www.wetlands.fws.gov. We recommend you avoid construction of wind towers and ancillary facilities in or adjacent to wetlands when possible.

Construction activities should be conducted in a manner that will minimize impacts to the existing habitat in the project area. Where impacts are unavoidable, we recommend that you:

- Time construction for late summer (after July 15) or fall so as not to disrupt waterfowl or other wildlife during the nesting season.
- Avoid construction in native prairie if possible and reseed disturbed native prairie with a comparable native grass/forb seed mixture. Obtain seed stock from nurseries within 250 miles of the project area to insure the particular cultivars are well adapted to the local climate.
- Minimize grassland disturbance by using fewer, larger turbines and limiting new road construction.

- Use underground transmission lines between turbines, as well as to the primary substation.
- Locate ancillary facilities to avoid placement of fill in wetlands along the route.
- Install and maintain appropriate erosion control measures to reduce sedimentation and water quality degradation of wetlands and streams near the project area.
- Replace unavoidable wetland losses with functionally equivalent wetlands and replace trees or shrubs destroyed during construction on a 2:1 basis.

Section 404 program

Section 404 of the Clean Water Act regulates placement of fill materials in wetlands. A Corps of Engineers' 404 permit may be required if fill material will be placed in aquatic sites including wetlands. Contact Mr. Dan Cimarosti, Regulatory Office, Corps of Engineers, 1513 South 12th Street, Bismarck, North Dakota 58504 (701-255-0015), to determine their permit requirements. If a 404 permit is required, the Service will provide recommendations on this project to the Corps.

Threatened and Endangered Species

A list of federally threatened and endangered species that may occur within the proposed project's area of influence is enclosed. This list fulfills requirements of the Fish and Wildlife Service under Section 7 of the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the Federal agency or its designated agent determines the action "is likely to adversely affect" listed species or modify critical habitat, the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "no effect" determination on listed species or critical habitat, further consultation is not necessary. If a private entity receives Federal funding for a construction project, or if any Federal permit is required, the Federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation.

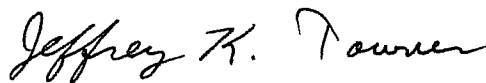
Section 10(a)(1)(B) of the Endangered Species Act allows non-Federal parties planning activities that have no Federal nexus, but which could result in the incidental taking of listed animals, to apply for an incidental take permit. The application must include a habitat conservation plan (HCP) laying out the proposed actions, determining the effects of those actions on affected fish and wildlife species and their habitats (often including proposed or candidate species), and defining measures to minimize and mitigate adverse effects.

During a site visit November 22, 2004, North Dakota Game and Fish Department (Department) staff observed a large nest structure in T. 157 N., R. 72 W., Section 1, SW¼. At the time of the field review, it could not be determined if the structure was a bald eagle nest or if it was built by some other raptor species. Bald eagles prefer forested habitats near bodies of water and most nest sites are located within one half mile of water. Adult bald eagles mate for life and tend to use the same nest year after year. Bald eagle nesting activity begins in mid-February and the young are usually fledged by mid-July. Although individual bald eagle pairs can show considerable tolerance to human activity, every effort must be made to minimize disturbance of nesting pairs. The Service recommends conducting a spring survey of the nest structure prior to project construction to determine the status of the potential bald eagle nest. Please forward the results of the survey to this office for our records.

On December 29, 2004, the Service met with the Department, HDR, and PPM Energy to discuss potential project issues. At that meeting, HDR Engineering presented a proposal to create a one mile buffer area around the potential bald eagle nest. If a survey indicates that the nest structure is being used by nesting bald eagles, a one mile buffer area with no disturbance should be sufficient to minimize impacts to nesting birds.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact Terry Ellsworth of my staff at 701-250-4481, or at the letterhead address above.

Sincerely,



Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosure

cc: ARD, ES, Denver (MAIL STOP 60120)
(Attn: R. Dach)
J. Clark Salyer WMD
(Attn: L. Albright)
Regulatory Office, Army Corps of Engineers, Bismarck
(Attn: D. Cimarosti)
Director, ND Game & Fish Department, Bismarck
(Attn: M. McKenna)

FEDERAL THREATENED AND ENDANGERED SPECIES
AND DESIGNATED CRITICAL HABITAT FOUND IN
PIERCE COUNTY, NORTH DAKOTA
January 2005

ENDANGERED SPECIES

Birds

Whooping crane (Grus Americana): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

THREATENED SPECIES

Birds

Bald eagle (Haliaeetus leucocephalus): Migrates spring and fall statewide but primarily along the major river courses. It concentrates along the Missouri River during winter and is known to nest in the floodplain forest.

Piping plover (Charadrius melodus): Nests on midstream sandbars of the Missouri and Yellowstone Rivers and along shorelines of saline wetlands. More nest in North Dakota than any other state.

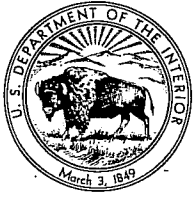
DESIGNATED CRITICAL HABITAT

Birds

Piping Plover - Alkali Lakes and Wetlands - Critical habitat includes: (1) shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; (2) springs and fens along edges of alkali lakes and wetlands; and (3) adjacent uplands 200 feet (61 meters) above the high water mark of the alkali lake or wetland.

**UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE**

J. CLARK SALYER NATIONAL WILDLIFE REFUGE
681 SALYER ROAD
UPHAM, ND 58789-9307
PHONE (701) 768-2548
FAX (701) 768-2834



January 13, 2005

Mr. Bruce Moreira
Environmental Scientist
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

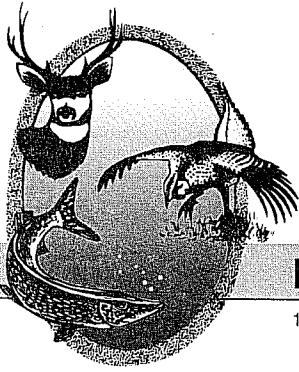
Dear Mr. Moreira:

Included as another attachment with this e-mail is the most accurate digital information we have for identifying (Native Grassland) or native prairie within the proposed project area. It's not perfect, but this should be good enough for the purpose of this exercise.

Please note the U.S. Fish and Wildlife Service has purchased a grass easement within fractional portions of Section 8, 9, and 10, T.158N., R.72W. The Service has established guidelines for considering wind turbine siting on these easement lands. Requests to site wind turbines on these lands are subject to a compatibility review and a right-of-way permit is required prior to constructing turbines, access roads, or performing other associated construction activities necessary to make the turbines operational. This process may take approximately one year to complete from the time a request for a right-of-way permit is received. Please contact me immediately should plans arise to place turbines within these areas. I appreciate your cooperation. If you need any additional information please let me know.

Sincerely,

Lee Albright



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

RECEIVED

JAN 20 2005

HDR Engineering, Inc.

January 14, 2005

Michelle Bissonnette
Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Dear Ms. Bissonnette:

RE: Rugby Wind Farm, Pierce County, North Dakota

The North Dakota Game and Fish Department has reviewed the proposed project area for wildlife concerns. Currently, this project proposes to place approximately 67 to 100 1.5 MW turbines north of the city of Rugby. Our primary concern is the disturbance of native prairie associated with construction of turbines, access roads, transmission lines, etc. We recommend the US Fish and Wildlife Service wind turbine siting guidelines be implemented as appropriate. We would appreciate being kept informed as this project progresses, and as other wind power projects are developed.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael G. McKenna".

Michael G. McKenna
Chief
Conservation & Communication Division

js

DEC 20 2004

HDR Engineering, Inc.



John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@state.nd.us
www.NDparks.com

December 14, 2004

Michelle Bissonnette
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Re: Rugby Wind Farm Project
Pierce County, North Dakota

Dear Ms. Bissonnette:

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above referenced wind farm project located in Sections 5-8, T157N, R71W; Sections 1-12, T157N, R72W; Sections 7-8, 17-20, and 29-32; T158N, R71W; and Sections 7-36, T158N, R72W, Pierce County.

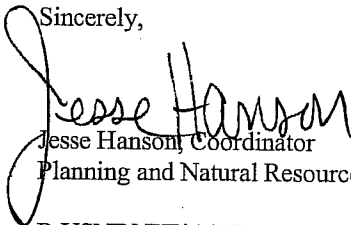
Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage Inventory has limited rare species information from the project area. Due to the lack of available survey data we cannot give an accurate assessment as to potential impacts to rare species and associated habitats.

The NDPRD recommends that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttonhefner (701-328-5370 or kgduttonhefner@state.nd.us) of our staff if additional information is needed.

Sincerely,


Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*1425



January 25, 2005

Mr. Gary R. Ness, Director
Aeronautics Commission
P.O. Box 5020
Bismarck, ND 58502-5020

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Ness:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

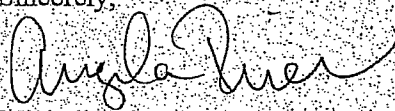
Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

PPM Energy is also studying the following corridor for locating the proposed transmission line:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-10
Torgerson	157N	72W	3-5, 8-17, 20-29, 32-36
Spring Lake	158N	72W	16, 17, 20-22, 27-29, 32-34

Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Attorney General Wayne Stenehjem
State Capitol
600 East Boulevard Avenue, Department 125
Bismarck, ND 58505

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Attorney General Stenehjem:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:


Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
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Sincerely,

for 
Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



January 25, 2005

Mr. Roger Johnson, Agriculture Commissioner
North Dakota Department of Agriculture
600 East Boulevard Avenue, Department 602
Bismarck, ND 58505-0020

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Johnson:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

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Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

PPM Energy is also studying the following corridor for locating the proposed transmission line:

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Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



January 25, 2005

Mr. Terry Dwelle, M.D.
State Health Officer
North Dakota Department of Health
600 East Boulevard Avenue
Bismarck, ND 58505-0200

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Dr. Dwelle:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

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Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



January 25, 2005

Ms. Carol K. Olson, Executive Director
North Dakota Department of Human Services
600 East Boulevard Avenue, Department 325
Bismarck, ND 58505-0250

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Olson:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

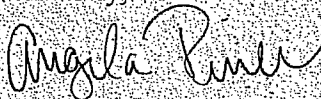
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Sincerely,



for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Leann K. Bertsch, Commissioner of Labor
North Dakota Department of Labor
600 East Boulevard Avenue, Department 406
Bismarck, ND 58505-0340

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Bertsch:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
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Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

PPM Energy is also studying the following corridor for locating the proposed transmission line:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-10
Torgerson	157N	72W	3-5, 8-17, 20-29, 32-36
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Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Wayne Kutzer, Director
North Dakota Department of Career and Technical Education
State Capitol 15th Floor
600 East Boulevard Avenue, Department 270
Bismarck, ND 58505-0610

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Kutzer:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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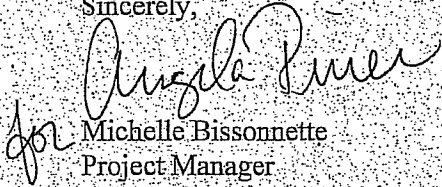
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Sincerely,


Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Martin White, Chairman
North Dakota Department of Commerce
1600 East Century Avenue, Suite 2
P.O. Box 2057
Bismarck, ND 58502-2057

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. White:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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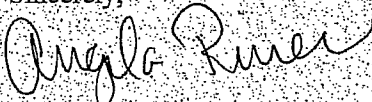
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Sincerely,

for 
Michelle Bissonette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Kim Christianson
Program Manager Energy Conservation and Renewable Energy
Division of Community Services
1600 East Century Avenue, Suite 2
P.O. Box 2057
Bismarck, ND 58502-2057

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Christianson:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Dean Hildebrand
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Hildebrand:

As you know, HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC) for the Rugby Wind Farm. On December 3, 2004, our office sent you a letter requesting your review of the project. Since that time, we have gained additional information about the project.

As we stated previously, the project is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. The project site area has been expanded since we last contacted you. The revised wind farm boundary includes the following Township, Ranges, and Sections in Pierce County, North Dakota:

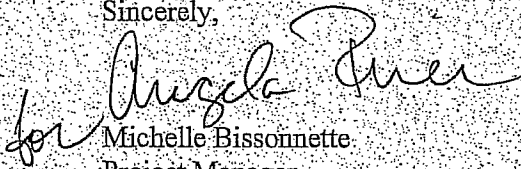
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In addition to the wind turbines, an approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND. This area is indicated on the attached map. As a result, we are also studying the following corridor for locating the proposed transmission line:

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Enclosed is a map detailing the location of the revised Rugby Wind Farm site location to facilitate your review. Additional comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Edward C. Murphy, Acting State Geologist
North Dakota Geological Survey
600 East Boulevard Avenue
Bismarck, ND 58505-0840

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Murphy:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Governor John Hoeven
600 East Boulevard Avenue, Department 101
Bismarck, ND 58505-0001

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Governor Hoeven:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Brad Darr, District Engineer
North Dakota Highway Department
District 3
316 Sixth Street South East
Devils Lake, ND 58301-0817

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Darr:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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Sincerely,


Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Cheryl Kulas, Executive Director
North Dakota Indian Affairs Commission
600 East Boulevard Avenue
1st Floor – Judicial Wing
Bismarck, ND 58505-0300

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Kulas:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

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Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

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January 25, 2005

Job Service North Dakota
P.O. Box 5507
Bismarck, ND 58506-5507

RE: Rugby Wind Farm, Pierce County, North Dakota

To Whom It May Concern:

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Sincerely,

for 
Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Rick Larson, Director of Minerals Management
North Dakota State Land Department
Energy Development Impact Office
P.O. Box 5523
Bismarck, ND 58506-5523

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Larson:

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Sincerely,

for 
Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Kathy Duttonhefner
North Dakota Parks and Recreation Department
Natural Resource Program
1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Duttonhefner:

As you know, HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC) for the Rugby Wind Farm. On December 3, 2004, our office sent you a letter requesting your review of the project. Since that time, we have gained additional information about the project.

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Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Pam Sharp, Director
North Dakota Office of Management and Budget
1600 East Boulevard Avenue, Department 110
Bismarck, ND 58505-0400

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Sharp:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:


Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

PPM Energy is also studying the following corridor for locating the proposed transmission line:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-10
Torgerson	157N	72W	3-5, 8-17, 20-29, 32-36
Spring Lake	158N	72W	16, 17, 20-22, 27-29, 32-34

Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



January 25, 2005

Mr. Kieth Bartholomay, Chairman
North Dakota State Soil Conservation Committee
2718 Gateway Avenue, Unit #104
Bismarck, ND 58503

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Bartholomay:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

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Walsh	157N	73W	1, 12
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Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

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Township Name	Township	Range	Sections
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Spring Lake	158N	72W	16, 17, 20-22, 27-29, 32-34

Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,

for 
Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



January 25, 2005

Mr. Dale Frink, State Engineer
North Dakota State Water Commission
900 East Boulevard
Bismarck, ND 58505-0850

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Frink:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

The proposed wind farm will be located in the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
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Spring Lake	158N	72W	1-36
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PPM Energy is also studying the following corridor for locating the proposed transmission line:

Township Name	Township	Range	Sections
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Torgerson	157N	72W	3-5, 8-17, 20-29, 32-36
Spring Lake	158N	72W	16, 17, 20-22, 27-29, 32-34

Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,



 Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Terry Ellsworth
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Ellsworth:

As you know, HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC) for the Rugby Wind Farm. On December 3, 2004, our office sent you a letter requesting your review of the project. Since that time, we have gained additional information about the project.

As we stated previously, the project is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. The project site area has been expanded since we last contacted you. The revised wind farm boundary includes the following Township, Ranges, and Sections in Pierce County, North Dakota:

Township Name	Township	Range	Sections
Tofte	157N	71W	5-8
Torgerson	157N	72W	1-12
Walsh	157N	73W	1, 12
Juniata	158N	71W	5-8, 17-20, 29-32
Spring Lake	158N	72W	1-36
East Barton	158N	73W	1, 12, 13, 24, 25, 36

In addition to the wind turbines, an approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND. This area is indicated on the attached map. As a result, we are also studying the following corridor for locating the proposed transmission line:

Township Name	Township	Range	Sections
Meyer	156N	72W	3-10
Torgerson	157N	72W	3-5, 8-17, 20-29, 32-36
Spring Lake	158N	72W	16, 17, 20-22, 27-29, 32-34

Enclosed is a map detailing the location of the revised Rugby Wind Farm site location to facilitate your review. Additional comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Ms. Trisha J. Feiring, District Conservationist
Pierce County Soil Conservation District
Rugby Field Office
126 2nd Avenue SW, Suite 104
Rugby, ND 58368-1724

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Feiring:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

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Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,


for Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.

January 25, 2005

Mr. Dan Cimarosti
U.S. Army Corps of Engineers, Regulatory Office
1513 South 12th Street
Bismarck, ND 58504

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Mr. Cimarosti:

On behalf of PPM Energy, HDR Engineering, Inc. (HDR) is notifying you of the above-mentioned project in accordance with NDCC 69-06-01-05. HDR is in the process of preparing an application for a Certificate of Site Compatibility to the North Dakota Public Services Commission (PSC). We request that you review the proposed project and provide comments and information about applicable permits that may be required from your office. You will also be receiving notice once the application is filed.

The Rugby Wind Farm is proposed to consist of up to 100 wind turbines with a capacity of up to 150 MW. The most likely turbine size is 1.5 MW wind turbine with a rotor diameter of up to 70-82 meters (231 to 269 feet). The wind turbines will be situated on 80 meter (262 feet) tall steel tubular towers secured to a concrete foundation. The exact turbine locations have not been determined to date. An approximately eight mile 115 kV or 230 kV transmission line will be needed to connect the wind project substation to the interconnection substation near Rugby, ND.

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Enclosed is a map detailing the location of the Rugby Wind Farm site location to facilitate your review. Comments received by February 14th, 2005 will be included in the Certificate of Site Compatibility Application to the PSC. If you require further information or have questions regarding this matter, please call me at (763) 278-5910. Thank you for your assistance.

Sincerely,

Michelle Bissonnette
Project Manager

Enclosures: Project Location Map

Cc: Mr. Tim Seck, PPM Energy, Inc.



STATE OF NORTH DAKOTA
OFFICE OF ATTORNEY GENERAL

STATE CAPITOL
600 E BOULEVARD AVE DEPT 125
BISMARCK, ND 58505-0040
(701) 328-2210 FAX (701) 328-2226
www.ag.state.nd.us

RECEIVED

FEB 3 2005

HDR Engineering, Inc.

Wayne Stenehjem
ATTORNEY GENERAL

January 31, 2005

Michelle Bissonnette
Project Manager
HDR
6190 Golden Hills Drive
Minneapolis MN 55416

Dear Ms. Bissonnette:

I am responding on behalf of the Attorney General to your recent letter asking this office to review your proposal and provide comments and information about applicable permits.

The Attorney General and members of his staff are prohibited by statute from giving legal advice, opinions, or assistance to private businesses or members of the public. We may only serve as legal advisors to state officials, state's attorneys, and certain city officials.

For legal advice and information, and to ensure compliance with all state laws and local ordinances, you may wish to consult an attorney in private practice licensed in North Dakota. He or she can review your information and advise you of your options. If you need assistance finding an attorney, you can contact the State Bar Association at (701) 255-1404.

Accordingly, we cannot take any further action in response to your letter.

Sincerely,

A handwritten signature in black ink that reads "Liz Brocker".

Liz Brocker
Executive Assistant



February 2, 2005

RECEIVED

FEB 7 2005

HDR Engineering, Inc.

Ms. Michelle Bissonnette
Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55418

Re: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Bissonnette:

This department has reviewed the information concerning the above-referenced project submitted to Dr. Terry Dwelle, under date of January 25, 2005, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.
2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
3. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

Environmental Health
Section Chief's Office
701.328.5150

Air
Quality
701.328.5188

Municipal
Facilities
701.328.5211

Waste
Management
701.328.5166

Water
Quality
701.328.5210

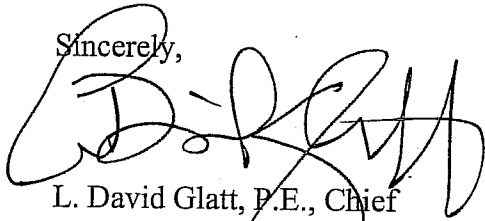
4. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,



L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc
Attach.



Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.

RECEIVED

Community Services

FEB 7 2005

Economic
Development & Finance

HDR Engineering, Inc.

February 2, 2005

Tourism
Workforce Development

Michelle Bissonnette
HDR Engineering, Inc.
6190 Golden Hills Dr.
Minneapolis, MN 55416



"Letter of Clearance" In Conformance with the North Dakota Federal Program Review System - State Application Identifier No.: ND050202-0039

Dear Ms. Bissonnette:

SUBJECT: PPM Energy - Rugby Wind Farm, Pierce County, North Dakota

The above referenced notice has been reviewed through the North Dakota Federal Program Review Process. As a result of the review, clearance is given to the project only with respect to this consultation process.

Century Center
1600 E. Century Ave

If the proposed project changes in duration, scope, description, budget, location or area of impact, from the project description submitted for review, then it is necessary to submit a copy of the completed application to this office for further review.

Suite 2
PO Box 2057

We also request the opportunity for complete review of applications for renewal or continuation grants within one year after the date of this letter.

Bismarck, ND 58502-2057

Please use the above SAI number for reference to the above project with this office. Your continued cooperation in the review process is much appreciated.

Phone 701-328-5300

Sincerely,

Fax 701-328-5320

www.ndcommerce.com

James R. Boyd
Manager of Governmental Services

cc: Tim Sect @ Midwest Renewables, PPM Energy





North Dakota Department of Transportation

David A. Sprynczynatyk, P.E.
Director

John Hoeven
Governor

RECEIVED

February 7, 2005

FEB 10 2005

HDR Engineering, Inc.

Michelle Bissonnette
HDR Engineering
6190 Golden Hills Drive
Minneapolis, MN 55416

RE: Rugby Wind Farm, Pierce County, North Dakota

Dear Ms. Bissonnette:

This letter is in response to your letter dated January 25, 2005, regarding your request to review the Rugby Wind Farm project.

I see that there will be a transmission line running across US Highway 2, from the substation, north. Please obtain all appropriate permits and risk management documents from the Devils Lake District office that may relate to this project.

If you have any questions, please call me at 701-665-5100.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Darr".

Brad Darr, P.E.
District Engineer

jp



John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@state.nd.us
www.NDparks.com

RECEIVED

FEB 11 2005

HDR Engineering, Inc.

February 8, 2005

Michelle Bissonnette
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Re: Rugby Wind Farm
Pierce County, North Dakota

Dear Ms. Bissonnette:

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above referenced project proposal to place wind turbines and transmission line in Sections 5-8, T157N, R71W; Sections 1-17, 20-29, and 32-36, T157N, R72W; Sections 1 and 12, T157N, R73W; Sections 5-8, 17-20, and 29-32, T158N, R71W; Sections 1-36, T158N, R72W; and Sections 1, 12, 13, 24, 25, and 36, T158N, R73W, Pierce County.

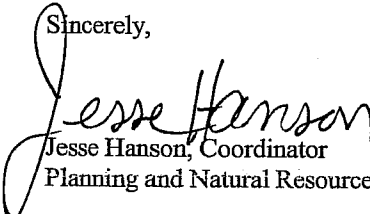
Our agency scope of authority and expertise covers recreation and biological resources (in particular rare species and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage Inventory has limited rare species information from the project area. Due to the lack of available survey data we cannot give an accurate assessment as to potential impacts to rare species and associated habitats.

The NDPRD recommends that any impacted areas be revegetated with species native to the project area.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttenhefner (701-328-5370 or kgdutzenhefner@state.nd.us) of our staff if additional information is needed.

Sincerely,


Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*1448

.....
Play in our backyard!

1707 North 9th Street
PO Box 5523
Bismarck, ND 58506-5523
Phone: (701) 328-2800
Fax: (701) 328-3650



www.land.state.nd.us
www.discovernd.com

Gary D. Preszler, Commissioner

February 11, 2005

HDR ENGINEERING INC
6190 GOLDEN HILLS DR
MINNEAPOLIS MN 55416

RE: Rugby Wind Farm, Pierce County, North Dakota

The Board of University and School Lands (Land Board) owns the following property within the proposed wind farm area and transmission corridor.

Township Name	Township	Range	Sections
Tofte	157	71	No school trust land
Torgerson	157	72	SW4 Sec. 2
Torgerson	157	72	NW4 Sec. 14
Torgerson	157	72	NW Sec. 22
Walsh	157	73	No school trust land
Juniata	158	71	No school trust land
Spring Lake	158	72	E2 & SW4 Sec. 16
Spring Lake	158	72	SE4 Sec. 36
East Barton	158	73	E2-36

We are supportive of the expansion of wind generation in North Dakota. School trust lands are managed in trust under the constitution and the congressional grant at statehood solely for the support of schools and various public institutions in North Dakota. For this purpose, the Land Board considers applications for activities on school trust lands that will generate income for the trusts. Wind generation can certainly generate income for the schools and we are ready to discuss easement terms with you.

Please be aware that any proposed use of school trust lands requires an easement or permit from the Land Board. Approval of locations or routes by the North Dakota Public Service Commission does not mean that it will be approved by the Land Board. If you are proposing to locate any facilities on the school trust lands identified above, you should contact us for preliminary discussions of routing before you complete your application with the Public Service Commission. It is easier to agree on possible routes and locations in advance. In that way, you will not need to amend your application to the Public Service Commission in the event that the Land Board does not agree with your proposal as it affects school trust lands.

Please contact Rick Larson, Mike Brand, or myself at 701-328-2800 if you need additional information about school trust lands which may be affected by your proposed project.

Sincerely,

Gary D. Preszler, Commissioner
State Land Department

GDP/mg
g:\support\gdp\letters\gdpltrs mg.doc



Natural Resources Conservation Service
502 Hwy 2 W, Suite 1
Devils Lake, ND 58301

**To: Michelle Bissonnette, Project Manager
HDR Engineering, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416**

Subject: Rugby Wind Farm

Date: Feb. 11, 2005

I recently received a copy of your letter to our Agency requesting comments on the Rugby Wind Farm Project. I also received a phone call from your office requesting information on prime farmlands, farmlands of statewide importance and farmlands of local importance which may occur in the project area. This information was provided over the phone.

The primary purpose of the FPPA (Farmland Protection Policy Act) is to reduce the conversion of prime farmland to non-agricultural uses. Presently, it only applies to projects which involve any federal funds. Your letter did not mention whether federal agencies are providing any funds for this project. If such is the case, then Form 1006 must be completed in order to properly evaluate any proposed sites for compliance with FPPA. Send me the form with parts I and III completed and I will complete parts II and IV and return to you with guidelines for assigning site assessment points. We do require a copy of the completed form (with points assigned for any alternate sites) to be returned to our office in a timely manner for our review. Please keep in mind when assigning points that it is rare that any site assessment would score less than 60 points, which means that most sites on prime farmland will exceed 160 points.

If federal funds are not involved, Form 1006 is not required, but we would encourage you to consider the purpose of FPPA in your site selection.

In either case, it is necessary that the project conform with all federal regulations and guidelines pertaining to wetland protection. In addition, care should be taken during the construction of the proposed project to minimize soil blowing and water erosion as these may cause negative impacts to adjacent farmlands.

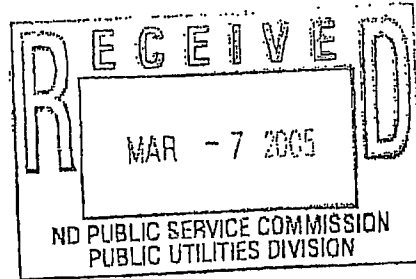
Please contact me if any further information or assistance is needed.

Sincerely,

**Alan R. Gulsvig
Area Resource Soil Scientist
Ph. (701) 662-7967 ext. 128**



PPM Energy
A ScottishPower Company



March 4, 2005

Ms. Ilona A. Jeffcoat-Sacco
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

Re: Wind Project Siting Process- Rugby Wind Farm

Dear Ms. Jeffcoat-Sacco:

Per North Dakota Public Service Commission ("Commission") staff request, PPM Energy, Inc. (PPM) is writing to you to propose a process for finalizing the placement of wind turbines that is compatible with North Dakota power plant siting rules and consistent with circumstances unique to permitting and siting wind projects.

Wind facility siting is a process through which input is considered from several different entities. When considering where to locate the wind farm in North Dakota, PPM originally identified four sites. These sites were identified based on expected wind resource and transmission availability. Next PPM conducted a "fatal flaw" analysis for the top two sites. The fatal flaw analyses looked at environmental conditions at each site and also further assessed wind resource and transmission. The Rugby site was identified as an optimal site from environmental, wind resource, transmission, and economic perspectives.

The next step in the development process was to secure the site by entering into agreements with landowners that were interested in having PPM place wind turbines and associated facilities on their property.

Once a site is selected and secured, the next step in the process is to identify preliminary turbine locations based on initial site inspection, topographic maps, known environmentally sensitive

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PU-05-305

Response to staff request; proposed process for placement of wind turbines by PPM Energy, Inc.

areas, review of the North Dakota's power plant siting exclusion and avoidance areas, review of Pierce County wind siting requirements, and communications with local, state and federal agencies. These preliminary turbine locations will be presented in our application for a Certificate of Site Compatibility ("Certificate"). This preliminary site plan is the commonly accepted standard for applications in other jurisdictions.

PPM suggests that the Certificate define the site area, maximum number of turbines and other structures related to wind generation to be located in the site area. Within the site area, PPM would be able to site turbines and other structures related to wind generation subject to required setbacks from environmentally sensitive areas, roads, and residences.

Once the Commission issues the Certificate, PPM would complete the studies required by the Certificate or PPM's siting process including microwave beam path analysis, geotechnical studies, wetland, biological, and cultural resource surveys. In addition, PPM would seek further input from landowners regarding the location of wind facilities. Once these additional studies and communications are completed, preliminary turbine and access road locations are re-evaluated for their appropriateness with the Certificate conditions and buffers. A final site plan for the 150 MW project would be submitted to the Commission prior to construction and a pre-construction meeting held with Commission staff to ensure that the site plan conforms to the Certificate requirements.

An analogous process can be found in Minnesota. In Minnesota, the site is evaluated based on a series of environmental parameters listed in the Wind Siting Rules (Minn. Rules Chapter 4401). PPM submits a preliminary site layout considering the environmental parameters listed in the Wind Siting Rules. If the application is considered complete and the project is compatible with "environmental preservation, sustainable development, and the efficient use of resources," a site permit is issued by the State with a set of conditions and mitigative measures specific to the project. After the site permit is issued, the wind project developer is given latitude to locate turbines within the permitted project area provided the site layout is consistent with the site permit conditions. The developer, however, must submit a final plan to the Minnesota Environmental Quality Board prior to construction.

Wind project siting is unique in that the project occupies a large area and must not only conform to Certificate conditions but must also optimize the wind resource at the site. Ideally, the Certificate provides the parameters within which the developer may optimize the site. With Certificate conditions in place, the developer is able to proceed with planning and development. Early approval of a Certificate is not only consistent with circumstances unique to wind project siting but it is also essential to timing given the uncertainty and limited duration of the federal production tax credit necessary for wind project development.

PPM believes that the aforementioned siting process is consistent with North Dakota siting rules and provides PPM the flexibility necessary to develop a timely, cost-effective project in an environmentally responsible manner.

*Ms. Ilona Jeffcoat-Sacco
North Dakota Public Service Commission
March 4, 2005
Page 3 of 3*

Please do not hesitate to contact me if PPM can provide any additional information or clarification. You can reach me by phone at 651-917-9285 or e-mail at timothy.seck@ppmenergy.com.

Sincerely,



Tim Seck
Manager of Midwest Renewables

cc: Michelle Bissonnette – HDR Engineering, Inc.



Public Service Commission

State of North Dakota

COMMISSIONERS

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Susan E. Wefald
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Executive Secretary
Ilona A. Jeffcoat-Sacco

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March 8, 2005

Tim Seck
PPM Energy Inc
2221 Riverwood Place
St. Paul, MN 55104

**RE: Rugby Wind Farm
Pierce County, North Dakota
Case No. PU-05-47**

Dear Tim:

The Commission and staff held a work session on March 8, 2005 to discuss the proposal outlined in your March 4, 2005 letter. The Commission agrees to proceed under the framework of PPM's proposal with the understanding that some details will likely need to be worked through as the process goes forward. For example, the level of final site plan approval necessary before starting construction could be decided after hearing and established as a condition in the Commission's order.

We look forward to receiving your application. If we can be of further assistance, please contact us.

Sincerely,

Annette Bendish
Public Utility Analyst



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

March 25, 2005

RECEIVED
MAR 30 2005

HDR Engineering, Inc.

[200560053]

Ms. Michelle Bissonnette – Project Manager
HDR Engineers, Inc.
6190 Golden Hills Drive
Minneapolis, MN 55416

Dear Ms. Bissonnette:

We have reviewed your request for Department of the Army, Corps of Engineers (Corps) jurisdictional wetland determination on a parcel of land located in several Sections in Townships 156, 157 and 158, Range 71, 72, 73 West, Pierce County, North Dakota.

Through Section 404 of the Clean Water Act the Corps regulates the discharge of dredged or fill material into waters of the United States. Waters of the United States may include, but are not limited to, lakes, ponds, rivers, streams, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and vernal pools. Based on the information that you provided to this office, we have made a preliminary determination that Section 33, T157N, R72W; Section 6, T156N, R72W; and Section 1, T156N, R73W appear to contain jurisdictional waters of the United States. Therefore, should the proposed project and/or associated construction activities result in the discharge of dredged or fill material into waters of the United States, a Corps permit may be required. If however, the project and associated work can be accomplished by avoiding impacts to waters of the United States, a Corps permit would not be required.

In order for the Corps to fully review the proposed mitigation project for Section 404 authorization, a completed Corps of Engineers permit application must be submitted to this office. Should construction activities associated with this project result in impacts to waters of the United States, please complete and submit the enclosed permit application to the U.S. Army Corps of Engineers, North Dakota Regulatory Office, 1513 South 12th Street, Bismarck, North Dakota 58504. It is essential to identify all impacts to waters of the United States resulting from the proposed project.

Should you have any questions regarding this determination, please do not hesitate to contact this office at telephone number (701)-255-0015 or at the letterhead address and reference project number 200560053.

Sincerely,

Jason Renschler
Project Manager
North Dakota Regulatory Office

Enclosure