Application For Certificate of Need

NOBLE FLAT HILL WINDPARK I, LLC

Docket No. IP-6687/CN-08-951

October 17, 2008

Noble Flat Hill Windpark I, LLC

PUBLIC VERSION

Table of Contents

List of Tables and Figures

List of Appendices

Table 1 - LEGF Certificate of Need Rule Cross-References

Rule No.	Title	CON Application Section
7849.0240	Need Summary and Additional Considerations	2
7849.0250	Description of Proposed LEGF and Alternatives	3
7849.0270	Peak Demand and Annual Electrical Consumption Forecast	4
7849.0280	System Capacity	5
7849.0290	Conservation Programs	6
7849.0300	Consequences of Delay	7
7849.0310	Environmental Information Required	8
7849.0320	Generating Facilities	8
7849.0330	Transmission Facilities	9
7849.0340	The Alternative of No Facility	10

1 Introduction

1.1 Introduction

Noble Flat Hill Windpark I, LLC ("Noble" or the "Applicant") is pleased to submit this application for a Certificate of Need to the Minnesota Public Utilities Commission ("Commission" or "PUC"), pursuant to and in accordance with Minnesota Statutes Section 216B.243 and Minnesota Rules Chapter 7849. The Applicant respectfully requests that the PUC issue a Certificate of Need for the Flat Hill Windpark (the "Project"), a "large energy facility" as defined in Minnesota Statutes Section 216B.2421, Subd. 2 (1).

The Applicant is a subsidiary of Noble Environmental Power, LLC, ("NEP"), a Delaware limited liability company based in Essex, Connecticut. NEP is an independent power developer and leading renewable energy company founded in 2004 in response to growing demand for clean, renewable sources of energy. NEP has approximately 3,850 MW of wind parks in operation or under development in eight states, including New York, New Hampshire, Vermont, Maine, Michigan, Minnesota, Texas, and Wyoming. NEP is majority-owned by JPMP Wind Energy (Noble), LLC, an indirect subsidiary of JPMorgan Chase & Co.

Located in Clay County, Minnesota, the Flat Hill Windpark will provide Minnesota with clean, renewable wind energy from one of the best sites in the state because of its strong wind resource and excellent interconnection location. The Project is located twelve miles east of the City of Moorhead and will be comprised of one hundred thirty four (134) GE 1.5 MW, 60 Hz wind turbines for a total installed capacity of 201 MWs. The Flat Hill Windpark has an anticipated commercial operation date of December 2010.

Associated infrastructure includes access roads, step-up transformers, an underground electrical collection system, an approximately 11-mile 230 kilovolt ("kV") overhead transmission line, a substation, and operations and maintenance ("O&M") building and layout areas. The 11-mile 230 kV transmission line is a generator outlet necessary to interconnect the Project with existing transmission facilities owned by Otter Tail Power Company ("OTP") at a designated point of interconnection ("POI").

The Applicant has not yet entered into any power purchase agreements ("PPA") for the Flat Hill Windpark's energy output at this time. The Applicant currently intends to offer the output from Project into the energy markets administered by the Midwest Independent Transmission System Operator, Inc. ("MISO") for ultimate sale to wholesale customers, including Minnesota utilities. In addition, the Project has had, and intends to continue to have, discussions with potential long-term purchasers, including

Minnesota utilities and other utilities and load serving entities in other states within the MISO system, of the energy output of the Project. The Project may execute one or more such PPAs prior to completion of the Project. However entering into such a PPA is not a requirement for the Project, as Applicant may instead elect to sell the energy into the short-term MISO wholesale market.

In the event Applicant sells the Project output into the MISO wholesale market, Applicant intends to separately sell the "green tags" or renewable energy credits ("RECs") associated with the output to Minnesota utilities to help them meet their renewable energy obligations. Through the Midwest Renewable Energy Tracking System ("M-RETS"), Minnesota's utilities will be able to purchase renewable energy credits to satisfy their renewable obligations. (*See* Minn. Stat. § 216B.1691, Subd. 4 ("To facilitate compliance with this section, the commission, by rule or order, shall establish by January 1, 2008, a program for tradable renewable energy credits for electricity generated by eligible energy technology.")).

The Flat Hill Windpark qualifies as "eligible energy technology" for the purposes of satisfying the Minnesota Renewable Energy Objectives and Standards ("REO"), as set forth in Minn. Stat. § 216B.1691. The REO require utilities to provide twelve percent of their "total retail electric sales" from eligible resources by 2012, with the number rising to twenty five percent by 2025. (Minn. Stat. § 216B.1691, Subd. 2a.)

1.2 Project Purpose and Objectives

The purpose of the Project is to provide a cost-competitive renewable energy resource to Minnesota utilities. Specifically, the objectives of the Project are to:

(1) Assist Minnesota utilities in meeting the REO by providing energy from a qualified renewable resource;

(2) Meet a significant portion of Minnesota's demand for additional energy at a low cost;

(3) Provide a facility that will enhance the diversity of Minnesota's electric supply portfolio; and

(4) Provide an efficient, economical, reliable and environmentally acceptable solution for meeting Minnesota's and the region's energy needs.

1.3 Fee Calculation (Minn. R. 7849.0210)

Table 2 - Fee Calculation

Fee Calculation Equation	$10,000 + $50/MW
Due with CON application	$5012.5
Due 45 days after application	$5012.5
Due 90 days after application submittal date	$5012.5
Due 135 days after application submittal date	$5012.5
Total Calculated Fee	$20,050
Statutory Maximum	$100,000

The total fee for the Certificate of Need application and the schedule for payment are shown in Table 2. The fee determination for the large electric generating facility is based on a capacity of 201.00 MW, per the requirements of Minnesota Rule 7849.0210 Subp. 1. The payment schedule is based on Minnesota Rule 7849.0210 Subp. 2.

1.4 Contact Information

Contacts:	*Mike Beckner* *Project Manager* *Noble Flat Hill Windpark I, LLC* *8 Railroad Avenue* *Essex, CT 06426*	*Brian Meloy* *Leonard Street and Deinard* *150 South 5th Street* *Suite 2300* *Minneapolis, MN 55402*
Phone:	*(860) 581-5010*	*(612) 335-1451*
Fax:	*(860) 767-7165*	*(612) 335-1657*
Email:	*becknerm@noblepower.com*	*brian.meloy@leonard.com*

1.5 Wind Power Development in Minnesota

The state of Minnesota has made a significant commitment to increasing the development and use of renewable electricity through various legislative and regulatory requirements. Indeed, Minnesota is a national leader in the development of wind-powered electrical generation. As of June 2008, Minnesota had 1366.15 MW of installed wind capacity, and a wind energy potential of 75,000 MW. (*See* the American Wind Energy Association's "U.S. Wind Energy Projects - Minnesota," http://www.awea.org/projects/projects.aspx?s=Minnesota (June 30, 2008)). Most recently, in 2007, the existing Statute setting forth the State's Renewable Energy Objectives was amended to require utilities to provide twenty-five percent (25%) of their total retail electric sales from eligible resources by 2025. (*See* Minnesota Statutes, Section 216B.1691, subd. 2a). As the owner of nuclear power plants, Xcel Energy is required to provide thirty percent (30%) of its total retail electric sales from eligible resources by 2020, with twenty-five percent 25% from wind energy resources.

The electric utilities subject to the REO include: Xcel Energy; Minnesota Power; Otter Tail Power; Interstate Power & Light; Northwestern Wisconsin Electric Company; Great River Energy; Minnkota Power Cooperative; Dairyland Power Cooperative; Basin Electric Power Cooperative; East River Electric Power Cooperative; L&O Power Cooperative; Southern Minnesota Municipal Power Agency; Missouri River Energy Services; Northern Minnesota Municipal Power Agency; Minnesota Municipal Power Agency; and Central Minnesota Municipal Power Agency. (*See* Minnesota Department of Commerce's Report, "The Next Generation: Renewable Energy Objective," at 15-28 (Jan. 2007) ("2007 Next Generation Report")).

The legislature has also established a requirement that all utilities provide customers with the option to select a renewable-based product for their energy needs. (Minnesota Statutes, Section 216B.169, subd. 2 (2006)). As one would expect, the demand for wind power development in Minnesota has grown rapidly and is likely to continue to grow in the future. The Flat Hill Windpark is specifically designed to offer a renewable energy resource that can assist Minnesota utilities meet their REO.

1.6 Exemptions from Certain Filing Requirements and Variance.

The Commission's Certificate of Need rules set forth in Chapter 7849 of Minnesota Rules apply to a broad range of projects and are in some respects focused on determining need for utility-built generation. With this recognition, the rules explicitly permit applicants to request exemptions from filing requirements that are not applicable to particular projects. Specifically, Minn. R. 7849.0200, Subp. 6 provides that the Commission will grant exemptions to certain information requirements of Chapter 7849 when the data requirements at issue (1) are unnecessary to determine need in a specific case; or (2) can be satisfied by submitting documents other than those required in the Rules.

On August 8, 2008, the Applicant filed with the PUC in this Docket a request for exemptions from certain Certificate of Need application filing requirements customarily granted to wind energy developers. Noble requested exemption from the requirements that are inapplicable to the Flat Hill Windpark because: (a) the requirements are specific to traditional utilities and inapplicable to independent power operators (*i.e.*, the requirements focusing on the applicant's "service area" and "system") ; (b) the requirements relate to consideration of nonrenewable alternatives and Flat Hill I Project is a renewable energy project; or (c) the requirements seek data which is non existent as to Flat Hill Windpark.

On October 16, 2008, the Commission issued an Order granting the following requested exemptions from the Certificate of Need filing requirements:

Partial exemption to the following rule part:

- 7849.250 (B) (4) Heat Rate – eliminate info requirement on non-renewable

Full exemption to the following rule parts or portions of rule parts:

- 7849.0240, subp. 2(B) Promotional Activities
- 7849.0250 (B)(1) – (3) Availability of Alternatives
- 7849.0290 Conservation Programs
- 7849.0320 (C), (D), and (G) Generating Facilities
- 7849.0330 Transmission Facilities

Exemption to the following rule parts to allow the Applicant to submit alternate information:

- 7849.0250 (C) Details of the Availability of Alternatives
- 7849.0250 (D) Map of Applicant's System
- 7849.0270 Peak Demand and Annual Consumption Forecast
- 7849.0280 System Capacity
- 7849.0300 Consequences of Delay
- 7849.0340 No-Facility Alternative

Throughout this Application, Noble notes where full or partial exemptions from information requirements were granted by the Commission.

2 Need Summary (Minn. R. 7849.0120 and .0240)

Minnesota Rule 7849.0120 outlines the criteria to be used by the Minnesota Public Utilities Commission to assess the need for a Large Energy Generation Facility ("LEGF"). As described fully in this Application, the Project satisfies all four of the Commission's criteria for granting certification of the Project:

(1) The Project will be an adequate, reliable, and efficient energy supply to Minnesota customers (7849.0120 A);

(2) The Project is the best alternative given its size, type, timing, cost, reliability, and effects on the natural and socioeconomic environment (7849.0120 B);

(3) The Project will benefit society by meeting overall state energy needs in an environmentally responsible manner (7849.0120 C);

(4) The Project is consistent with overall state energy needs and will comply with all applicable policies, rules, and regulations (7849.0120 D).

2.1 More Adequate, Reliable, and Efficient Energy Supply (Minn. R. 7849.0120 A).

The Flat Hill Project will provide up to 201 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. The Project's output will be available for purchase on the wholesale market (either through a PPA or through purchases of energy in the MISO markets) by utilities that must meet the REO. The energy and capacity that will be generated by the Flat Hill Project will provide a significant amount of clean low-cost energy needed to satisfy well-documented state and regional demand.

In its "2007 Annual Report," the Mid-Continent Area Power Pool ("MAPP") projected an annual growth rate in demand of 1.71% in the summer months between 2008 and 2017. (The Annual Report can be found at http://www.mapp.org/assets/pdf/annual/2007/MAPP%202007%20Annual%20Report%20Web%20Res.pdf). In addition, the Department identified a need for new electrical generation in Minnesota, recently recommending approval of an average annual growth rate (peak) of 1.24% from 2008-2022 for Xcel Energy, the state's largest utility. (*See OES'* June 23, 2008 Comments in Docket No. E002/RP/07-1572). Moreover, there is a particular need in Minnesota for the renewable energy sources.

As previously noted, the REO Statute was recently amended to require utilities to provide twenty-five to thirty percent of their total retail electric sales from eligible (renewable) resources by 2025. Those resources that count toward satisfying the mandate include wind energy. Utilities in the State have recognized the need for renewable energy to satisfy the REO. For example, in its June 1, 2008 Resource Plan, Great River Energy ("GRE") noted that "[i]n the next five years, the only resource additions indicated in the preferred plan are wind. Since there is no assurance that the federal Production Tax Credit will be extended indefinitely, there is an incentive to acquire wind resources ahead of our needs." (GRE's 2008 Resource Plan at page 9, which can be found at http://www.greatriverenergy.com/projects/future_plans/2008_rp_public.pdf). Minnesota utilities' need for renewable resources has been confirmed by the Department.

In 2007 Next Generation Report, for instance, the Department includes compliance information for each utility subject to the REO Statute at pages 15-28. Based on the information provided by the Department, each utility's 2006 percentage of total retail electric sales provided by REO generation is listed in Table 3.

Table 3 - REO Generation as a % of Total Retail Sales

Utilities Subject to the REO	REO Generation as a % of Total Retail Sales (as reported in 2006)
Xcel energy	3.11%
Minnesota Power	4.50%
Otter Tail Power	5.05%
Interstate Power & Light	5.61%
Northwestern Wisconsin Electric Company	4.48%
Great River Energy	3.93%
Minnkota Power Cooperative (combined with Northern Minnesota Municipal Power Agency)	2.14%
Dairyland Power Cooperative	3.84%
Basin Electric Power Cooperative (including East River Electric Power Cooperative)	1.0%

Southern Minnesota Municipal Power Agency	0.703%
Missouri River energy Services	1.03%
Minnesota Municipal Power Agency	0.04%
Central Minnesota Municipal Power Agency	3.45

Based on the information provided by the Department, Table 4 shows the incremental percentage increases in renewable resources each utility must meet in the timeframes specified by the REO Statute.

Table 4 - Incremental Percentage Increases in Renewable Resources Needed

Utilities Subject to the REO	2006 REO Generation %	Additional % Needed by 2012 to Meet 12% REO Requirement	Additional % Needed by 2016 to Meet 17% REO Requirement	Additional % Needed by 2020 to Meet 20% REO Requirement	Additional % Needed by 2025 to Meet 25% REO Requirement
Minnesota Power	4.50%	7.5%	12.50%	15.5%	20.5%
Otter Tail Power	5.05%	6.95%	11.95%	14.95%	19.95%
Interstate Power & Light	5.61%	6.39%	11.39%	14.39%	19.39
Northwestern Wisconsin Electric Company	4.48%	7.52%	12.52%	15.52%	20.52%
Great River Energy	3.93%	8.07%	13.07%	16.07%	21.07%
Minnkota Power Cooperative (combined with Northern Minnesota Municipal Power Agency)	2.14%	9.86%	14.86%	17.86%	22.86%
Dairyland Power Cooperative	3.84%	8.16%	13.16%	16.16%	21.16%

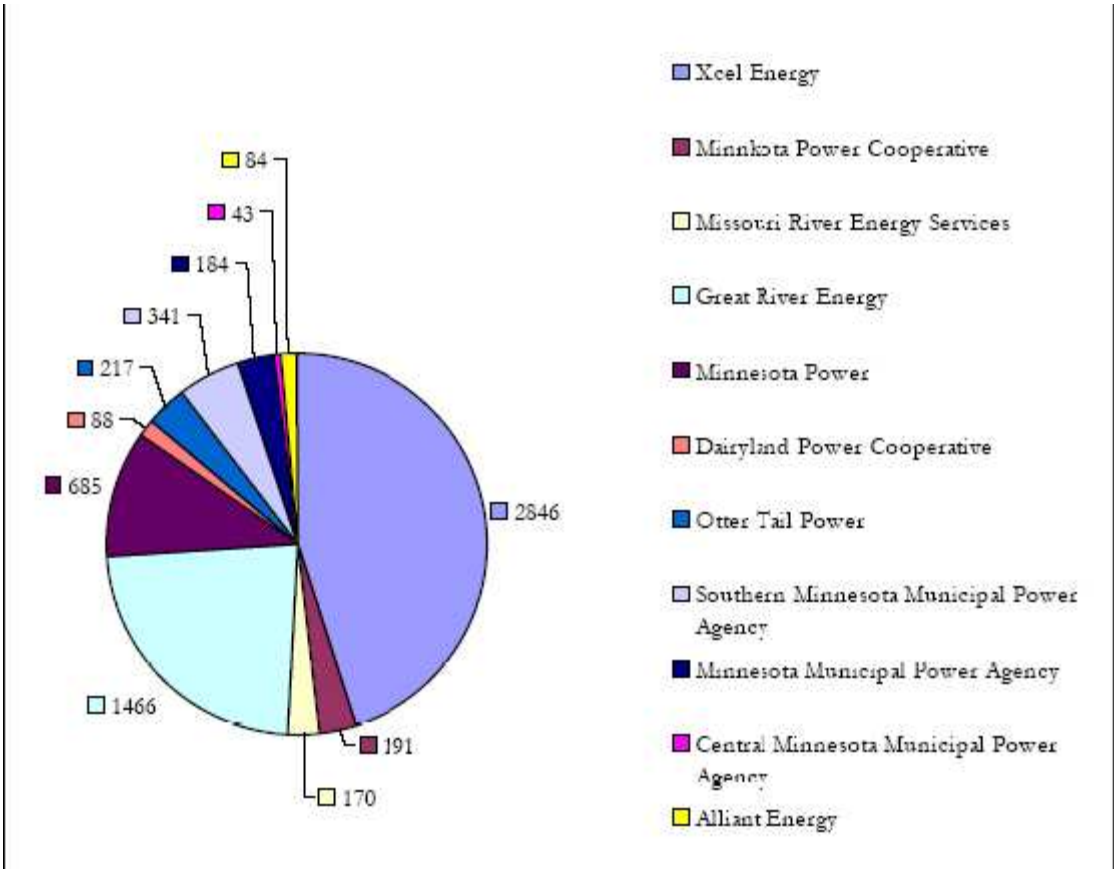
Basin Electric Power Cooperative (including East River Electric Power Cooperative and L&O Power Cooperative)	1.0%	11.0%	16.00%	19.0%	24.0%
Southern Minnesota Municipal Power Agency	0.703%	11.97%	16.97%	19.297%	24.297%
Missouri River Energy Services	1.03%	10.97%	15.97%	18.97%	23.97%
Minnesota Municipal Power Agency	0.04%	11.96%	16.96%	19.96%	24.96%
Central Minnesota Municipal Power Agency	3.45%	8.55%	12.55%	16.55%	21.55%
Utility Subject to stricter REO	**2006 REO Generation %**	**Additional % Needed by 2010 to Meet 15% REO Requirement**	**Additional % Needed by 2012 to Meet 18% REO Requirement**	**Additional % Needed by 2016 to Meet 25% REO Requirement**	**Additional % Needed by 2020 to Meet 30% REO Requirement**
Xcel Energy	3.11%	11.89%	14.89%	21.89%	27.89%

While 471.05 MWs of wind energy resources have been added in the state since the Department issued its 2007 Next Generation Report, there remains a substantial need for wind energy resources to meet the REO. (*See* American Wind Energy Association, U.S. Wind Energy Projects - Minnesota, http://www.awea.org/projects/projects.aspx?s=Minnesota (June 30, 2008)). Indeed, in its December 10, 2007, Renewable Energy Plan, Xcel Energy stated:

> Because the RES applies to all Minnesota electric utilities, we anticipate there will be ***substantial growth in renewable resources in the state and significantly increased competition for available resources***, the best development sites, and transmission capacity. Estimates of the amount of incremental, new renewable resources required to meet the RES range from 5,000 to 6,500 MW, broken down by electric provider as follows:

Figure 4

Estimated Incremental Renewables for MN Utilities
(Noted in MW)



(See Xcel's December 10, 2007 Renewable Energy Plan at page 21, which can be found at http://www.xcelenergy.com/docs/RenewableEnergyPlan_12.10.2007.pdf, emphasis added). This pie chart illustrates that significant investment in renewable energy resources must be made in the near term to meet the REO.

As noted above, the revised REO Statute requires utilities to provide an increasing percentage of their total retail electric sales from eligible resources over the next 20 years. In addition, it requires that Xcel Energy have 30 percent of its total retail electric sales from eligible resources by 2020, with all but 5 percent of the REO generation supplied by wind energy conversion systems. (*See* Minnesota Statutes,

216B.1691, subd. 2(b)). To satisfy the REO, Minnesota utilities must develop or purchase a significant amount of REO generation or, in the alternative, acquire RECs through a Commission-established program like M-RETS. (*See* Minnesota Statutes, 216B.1691, subd. 4). Given that the REO may be satisfied through the purchase of either REO generation or RECs based on the production of renewable energy, a market exists for independently produced electricity generated from wind resources. While planned renewable energy facilities not requiring a CON may contribute to the level of renewable energy available, larger renewable energy facilities, such as the Flat Hill Project, are needed in order to provide sufficient, economical and reliable generation resources to Minnesota utilities. For these reasons, there is clearly a state and regional need for the Flat Hill Project.

Finally, it must be recognized that Minnesota law provides a clear preference for renewable resources. First, Minnesota Statutes § 216B.243 subd. 3a states that:

> The Commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the Commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.

Second, Minnesota Statutes § 216B.2422 subd. 4 states that:

> The Commission shall not approve a new or refurbished nonrenewable energy facility in an integrated resource plan or a certificate of need, pursuant to section 216B.243, nor shall the Commission allow rate recovery pursuant to section 216B.16 for such a nonrenewable energy facility, unless the utility has demonstrated that a renewable energy facility is not in the public interest.

The Flat Hill Project is clearly consistent with the State's broader energy objectives.

2.2 Best Alternative (Minn. R. 7849.0120 B).

The Project is the best alternative given its technology, size, location, timing, cost, effects upon the natural and socioeconomic environments, and the expected reliability. Given that the Project is designed to provide energy that can be purchased on the wholesale market by utilities to aid in meeting the REO requirements, non-renewable generation sources are not a viable alternative to the Project. With respect to other renewable energy resources, the Project's location is particularly well-suited for a wind energy conversion system.

2.2.1 Technology

A fossil-fueled resource would not help Minnesota utilities meet the REO and therefore is not an acceptable alternative. Other renewable energy generation sources are not appropriate for the site, are more costly, are less reliable, would more greatly impact current land use, and could not generate the landowner support that the proposed Project has garnered.

2.2.2 Size

The Flat Hill Project is appropriately sized to take advantage of economies of scale. As discussed above, Minnesota utilities are required to meet an aggressive REO. Xcel Energy has confirmed that "there will be substantial growth in renewable resources in the state and significantly increased competition for available resources, the best development sites, and transmission capacity. Estimates of the amount of incremental, new renewable resources required to meet the RES range from 5,000 to 6,500 MW." *(See* Xcel's December 10, 2007 Renewable Energy Plan at page 21, which can be found at http://www.xcelenergy.com/docs/RenewableEnergyPlan_12.10.2007.pdf, emphasis added). The Flat Hill Project is sized to assist in meeting the clear need for renewable resources as described more fully above.

2.2.3 Location

Located in Clay County, the Project takes advantage of an excellent wind resource, a robust interconnection, and an accepting community. The wind resource is comparable to that at Buffalo Ridge, but the Project will not be subject to the transmission constraints and congestion issues that occur in southwestern Minnesota. Associated infrastructure include access roads, step-up transformers, an underground electrical collection system, an approximately 11-mile 230 kV overhead transmission line, a substation, and O&M building and layout areas. The 11-mile 230 kV transmission line is a generator outlet necessary to interconnect the wind farm with existing transmission facilities owned by OTP at a

designated POI. The community is eager for the Flat Hill Project to be built because of the economic benefits it will bring.

2.2.4 Timing

The Project's anticipated commercial operation date of December 2010 is perfect from a timing perspective. As noted in Table 5 above, every utility subject to the REO must add additional eligible renewable generation by 2010 (Xcel) or 2012 (all other utilities). Moreover, as GRE correctly indicated in its June 2008 Resource Plan, it is uncertain how long the Federal Production Tax Credit ("PTC") will be available to wind resources in the future. Although the PTC was recently extended another year through 2009, it is not clear how many more years the PTC will be available. Because the Project will be in operation within the next 2-3 years, there is a better chance that Project will receive this important PTC benefit, which directly reduces the price Minnesota utilities or other wholesale purchasers will pay for the energy from the Project. Furthermore, the Project will be able to stay on schedule because it is actively pursuing an interconnection agreement with MISO and OTP, turbines have been ordered, and five years of onsite wind data have been compiled.

2.2.5 Cost

With respect to the Flat Hill Project's cost effectiveness in comparison to other wind projects, as noted above the Applicant does not yet have a PPA. Therefore, the Applicant will have to find a willing buyer or buyers by offering a competitive rate. A PPA with an investor-owned Minnesota utility would be subject to review and approval by the Commission. Cooperative and municipal utilities are not-for-profit entities and have an every incentive to reduce costs. Therefore, the Applicant's proposed project will have to be cost effective in order to sell the project's output under a long-term PPA or similar bilateral arrangement.

Moreover, in the absence of a PPA, the Applicant will likely offer the Flat Hill Project's output into the MISO energy market as a "price taker" – that is – it will bid $0 into the market and be paid the market clearing price ("MCP"). This "merchant wind" model has been used by Noble in other organized markets and ensures that the wind facility is dispatched at the lowest possible cost for consumers.

2.2.6 Effects on Natural and Socioeconomic Environments

One of the greatest attributes of wind energy is its minimal impact on the environment and positive impact on local economies. The Project will not release any pollutants, such as carbon dioxide, sulfur dioxide, nitrogen oxides, mercury, or particulate matter. It will not require water for power generation and

will not discharge wastewater containing any heat or chemicals during operation. It will produce energy without the extraction, processing, transportation, or combustion of fossil fuels. The Project will directly impact less than 1% of the total acreage within the wind farm boundaries with wind turbines, access roads, transformers, a substation, and an operations and maintenance building. Farmers in the Project area will receive annual rent payments for leasing their land. Crops may be planted up to the edges of turbines and roads, so minimal cropland will be taken out of production. The Project will provide income to the community through production tax payments, jobs, and local spending. The Flat Hill Windpark will be a great addition to the community.

2.2.7 System Reliability

While reliability is often cited as a key criticism of wind energy facilities, this criticism is misguided. The concept of reliability should not be confused with the inherent intermittent nature of wind resources. The wind turbines themselves are technologically advanced machines that are very reliable, and the Applicant's experience at other wind farms has shown that they are available to produce power more than 97% of the time. At the Flat Hill Windpark, if one turbine has a problem, there will still be 133 other turbines capable of producing power. This contrasts with other forms of generation, where a problem with one unit could significantly impact energy production. Furthermore, using a variety of generation technologies reduces the risks that arise from relying on one or a few technologies too heavily. The Project also provides Minnesota utilities with geographic diversity in their wind resource portfolio because it is located in Clay County, Minnesota, far from the bulk of its Minnesota wind projects in south central and southwestern Minnesota.

Finally, in December 2006, the Minnesota Public Utilities Commission's Reliability Administrator issued a wind integration study ordered by legislation signed by Governor Pawlenty in 2005, which concluded that "the addition of wind generation to supply 20% of Minnesota retail electric energy sales can be reliably accommodated by the electric power system if sufficient transmission investments are made to support it." (*See* the 2007 Next Generation Report at pages 10-11.). Because Minnesota has not reached the 20% threshold, it is clear that the Flat Hill Windpark can be brought online in a reliable and cost-effective manner.

2.3 Benefits Society (Minn. R. 7849.0120 C).

The energy produced by the Flat Hill Windpark will provide significant, numerous, and varied societal benefits. The Project will provide Minnesota utilities and the state of Minnesota with affordable, clean,

renewable energy that will help meet energy demands and the REO. It will produce enough energy to meet the energy needs for approximately 70,000 average households. Overall national security and energy reliability can both be enhanced through the development of diversified (and domestic) generation sources such as wind. The Project will produce energy without causing any major environmental damages, such as the emission impacts from fossil fuel generation.

Further, the local economy will benefit from the landowner lease payments, production taxes, jobs, and local spending. The local property taxes generated from the Flat Hill Windpark through the state production tax are estimated to be in excess of $800,000 per year. In addition, in light of the current economic downturn, the jobs created by the Project are an important benefit to Minnesota generally, and Clay County, in particular. As noted, construction of the Project is expected to commence in the spring of 2010 and be complete by December 2010. During this time, approximately 100 construction jobs will likely be created. Further, the Project sponsor anticipates that the operation and maintenance of the Project, once operational, is likely to generate six to eight permanent positions. The establishment of this area of Minnesota as an important producer of alternative energy may also encourage the development of wind related businesses in the area, and thus contribute to economic growth in the region.

The Project will not likely have a significant impact on future development in the Project region beyond the economic benefits associated with the Project. As an IPP, the Project is likely to have less of an effect on regional development than would a public utility which builds a similar project to meet a specific regional need. The availability of power is a prerequisite to development in general, but the Project is not tied to any development of a particular use, zoning category, or location. Indeed, the Applicant has not participated in any promotional activities that may have given rise to the demand for the facility.

Finally, the Department in its 2007 Next Generation Report recognized that additional wind energy infrastructure will provide significant benefits to the local economy and local landowners, stating:

> As the renewable energy targets get larger, the consequences of greenhouse gas emissions in the global atmosphere become clearer, and the benefits to the state's economy of renewable development more significant, it will be even more important to hold utilities accountable to the NexGen REO. [2007 Next Generation Report at page 8.]

Here, the Project will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health.

2.4 Consistent with Rules and Policies (Minn. R. 7849.0120 D).

The project serves overall state and regional energy needs, addresses federal and state energy policy and complies with all applicable rules and regulations.

2.4.1 Project is Consistent with Federal Energy Policy

2.4.1.1 Tax Incentives for Development of Renewable Energy

The federal government has spent a significant amount of money in the last 20 years to develop renewable energy resources. One such direct method is the PTC that was recently extended until the end of 2009. The PTC can be found in the United States Code at 26 USC § 48 (2005) where the credit of $0.019/kW is available for the first 10 years of the renewable energy plant's operating life. The PTC allows wind energy generation costs to be even more competitive with traditional fossil fuel technologies.

In addition, the Internal Revenue Service ("IRS"), under the Modified Accelerated Cost Recovery System ("MACRS"), has allowed businesses to recover investments in solar, wind, and geothermal property through depreciation deductions. For solar, wind, and geothermal property placed in service after 1986, the current MACRS property class is five years. This allows companies utilizing renewable energy investments to recover costs before PTC benefits run out.

2.4.1.2 Promotion of Competition

In the 1992 Energy Policy Act, Congress created the classification "Exempt Wholesale Generators" ("EWG"). The Act's legislative history notes that its electricity provisions "will promote additional competition in [the] wholesale electricity power market in order to improve the efficiency of the electric industry and secure the lowest possible costs for consumers".[1] The Act vested the Federal Energy Regulatory Commission ("FERC") with the jurisdiction to determine, after an application process, whether an entity would be an EWG. In the Act, Congress reserved for the states the authority to regulate "environmental protection or the siting of facilities" that might qualify as EWGs.[2] The Project, which will qualify as an EWG, will promote competition within the wholesale electric supply markets.

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[1] H.R. Rep. No. 102-474(1), 102nd Cong., 2nd Sess. (1992), reprinted in 1992 U.S.C.C. A.N. 1953, 1961.

[2] *See generally,* 15 USC § 79 *et seq.*

2.4.2 Project is Consistent with Minnesota Energy Policy

One key objective of the Flat Hill Windpark is that it will provide a significant amount of efficient renewable energy. The state of Minnesota has a policy to increase its use of renewable energy. This has been demonstrated in the Legislature's statutes and mandates as well as in recommendations by other state agencies.

2.4.2.1 Legislative Preference

The Minnesota legislature has found that:

"the following energy sources for generating electric power distributed in the state listed in their descending order of preference, based on minimizing long-term negative environmental, social and economic burdens imposed by the specific energy sources are:

(1) ***Wind*** *and solar.*

(2) Biomass and low-head or refurbished hydropower.

(3) Decomposition gases produced by solid waste management facilities, natural gas fired cogeneration, and waste materials or by-products combined with natural gas.

(4) Natural gas, hydropower that is not low-head or refurbished hydropower, and solid waste as a direct fuel or refuse-derived fuel.

(5) Coal and nuclear power"…

"For the purposes of paragraph (c) within each clause, the more ***efficient*** *an energy source is in generating electricity or the more efficient a technology is that utilizes an energy source, the more preferred it is for use in generating electricity for distribution and consumption in the state"* (Minnesota Statutes 216C.051, Subp. 7. Emphasis added).

The Project clearly is consistent with the stated legislative preference for wind and efficient energy sources. The Project also minimizes "negative environmental, social and economic burdens imposed by the specific energy sources" when compared to feasible fossil-fueled alternatives.

2.4.2.2 Legislative Mandates

The Project objective will provide a significant amount of efficient, renewable energy, which is consistent with Minnesota's policy to increase renewable energy use. Wind, as a renewable energy, is a favored energy source under the Certificate of Need Statute. (*See* Minnesota Statutes, Section 216B.243, subd. 3a (2006)). Also, as discussed above, the recently amended REO includes the requirement that Minnesota utilities obtain 25-30% of their electric generation from renewable resources – including, most prominently, wind resources. (Minnesota Statutes, Section 216B.1691, subd. 2). As the Department of Commerce has recently emphasized, "there is nothing voluntary about the REO." (2007 Next Generation Report, at the Executive Summary (Jan. 2007)).

In addition, the state legislature has exempted all real and personal property of wind energy conversion systems from property taxes. (Minnesota Statutes, Section 272.02, subd. 22 (2006)). Wind energy conversion systems, as well as the materials used to manufacture, install, construct, repair, or replace wind systems, are also exempt from state sales tax. (Minnesota Statutes, Section 297A.68, subd. 12 (2006)). These benefits further demonstrate Minnesota's commitment to wind energy development.

Finally, the Pawlenty Administration released its preliminary climate change action plan to the legislature on February 1, 2008 as required by Minnesota Statute 216H.02, Subd. 2. The preliminary climate change action plan provides a roadmap to reach the state's goal of reducing "statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050." (Minn Stat. Sec. 216H.02, Subd. 1). Consistent with this objective, part of the Preliminary Climate Change Action Plan (February 1, 2008) includes the objective of reducing "regulatory barriers by eliminating the Certificate of Need requirement for generation and transmission facilities needed to meet the renewable energy standard." (The Plan can be found at http://www.state.mn.us/mn/externalDocs/Commerce/Preliminary_Climate_Change_Action_Plan_020508104330_MN-CCAP%20Final%202-1-08.pdf).

2.4.2.3 Green Pricing Programs

Green pricing programs have created an increase in demand for renewable energy resources in both the near- and long-term. These programs typically provide an option for electric consumers to pay a premium for renewable energy in lieu of traditional exhaustible energy sources. The Minnesota Legislature passed a law that requires all utilities in the state to offer green power options to their customers. (*See* Minnesota Statutes, § 216B.169).

In addition, Minnesota's participation in a regional renewable energy tracking system was authorized by legislation signed by Governor Pawlenty in 2003. Through M-RETS, Minnesota's utilities will be able to purchase RECs to satisfy their renewable obligations. M-RETS tracks renewable energy generation in participating States and Canadian Provinces and assists in verifying compliance with individual state/provincial or voluntary Renewable Portfolio Standards ("RPS") and objectives. (*See generally,* 2007 Next Generation Report at page 10 (Jan. 2007)).

2.4.2.4 The Project Complies with Federal and State Environmental Regulations

The Project will meet or exceed the requirements of all federal and state environmental laws and regulations. Tables 5 and 6 provide a list of approvals the Project may be required to obtain from governmental entities in support of full compliance. In particular, Table 5 outlines the principal permits required for the Project. Table 6 lists other incidental permits that Applicant may be required to obtain in the future. The Applicant is committed to obtaining all necessary environmental approvals required under federal, state, and local levels.

Table 5 - Primary Permits and Approvals

Permit	Permitting Agency	Trigger	Permit Required
FEDERAL			
Notice of Proposed Construction or Alteration	Federal Aviation Administration	Facility safety lighting	Yes
Determination of No Hazard	Federal Aviation Administration	Turbines and facility safety lighting	Yes
Exempt Wholesale Generator Status	Federal Energy Regulatory Commission	Self-Certification of exempt wholesale generator requires filing with the Commission	Yes
Market-based Rate Authorization (Petitions for Rate Approval pursuant to Section 284.123 (b)(2) 18 C.F.R. Section 381.403)	Federal Energy Regulatory Commission	Commissioning of the wind facility	Yes
STATE OF MINNESOTA			
Site Permit	Minnesota Public Utilities Commission (PUC)	Construction of a Large Wind Energy Conversion System (LWECS) defined as a system capable of generating over 5MW	Yes
Certificate of Need	PUC	Construction of large energy facility defined as a plant with a combined capacity greater than 50 MWs.	Yes
Route Permit	PUC	a Route Permit for the proposed 230 kV transmission line is required by Minnesota Rules Chapter 7849 and Minnesota Statutes Chapter 216E	Yes
General NPDES Permit for Stormwater Discharges Associated with Construction Activities	Minnesota Pollution Control Agency (MPCA)	Disturbance of greater than 1 acre of ground.	Yes
CLAY COUNTY			
Highway Access Permit (County and Local Roads)	Clay County Engineer and Township Chairs	Access to county and local roads from wind farm facilities.	Yes

Table 6 - Incidental Permits and Approvals That May Be Required

Permit	Permitting Agency	Trigger	Permit Required
FEDERAL			
Clean Water Act Section 404 Permit: GP/LOP-98-MN	U.S. Army Corps of Engineers; St. Paul District Office	Discharges of dredged or fill material into waters of the United States, including their adjacent wetlands	TBD
STATE OF MINNESOTA			
Section 401 Water Quality Certification	MPCA	Impacts to waters of the US (Corps Section 404 permit)	TBD
Very Small Quantity Hazardous Waste Generator License	MPCA	Generation more than 100 pounds of hazardous waste each year	TBD

Above-ground Storage tank (AST) Notification Form	MPCA	Any above-ground petroleum storage tank 500 gallons or greater	TBD
License for Crossing Public Land and Waters	Minnesota DNR	Any wind farm facilities that require crossing of or location on State administered Public Land or Waters	TBD
Public Waters Work Permit	Minnesota DNR	Any construction activities that impact waterways, including wetlands applies to public waters that are identified on DNR public waters inventory maps	TBD
Wetland Conservation Act Compliance	Mower County Soil & Water Conservation District – MN Board of Soil and Water Resources (rules)	Construction activities that impact non-state wetlands	TBD
Well Construction Notification	Minnesota Dept. of Health (MDH)	Installation of private well(s) for O&M building	TBD
Highway Access Permit	Minnesota Dept. of Transportation	Access to State roads from wind farm facilities.	TBD
Utility Access Permit	Minnesota Dept. of Transportation	Utility construction impacts to state roads	TBD
Potential Mitigation Measures	Minnesota Historical Society	Identification of archaeological sites	TBD
Electrical Inspection	Department of Labor and Industry	Specified electrical installations.	TBD
Building Permits Under State Building Code	Municipal building official within municipalities that have adopted State Building Code	Specified construction within municipalities that have adopted State Building Code	TBD
CLAY COUNTY			
Individual Sewage Treatment System Permits (ISTS)	Clay County Office of Planning and Environmental Assistance	Connection to existing or approval of on-site sewage and water (O&M building).	TBD

3 Description of Proposed Project and Alternatives (Minn. R. 7849.0250)

3.1 Proposed Project (Minn. R. 7849.0250 A)

The Project is located twelve miles east of the City of Moorhead and will be comprised of one hundred thirty four (134) GE 1.5 MW, 60 Hz wind turbines for a total installed capacity of 201 MWs. The Flat Hill Project has an anticipated commercial operation date of December 2010. Associated infrastructure include access roads, step-up transformers, an underground electrical collection system, an approximately 11-mile 230 kV overhead transmission line, a substation, and O&M building and layout areas. The proposed Flat Hill transmission line and associated facilities for which a route permit has been requested (Docket No. IP6687/TL-08-988) include:

- A new single circuit 230 kV transmission line to capture energy generated by the Flat Hill Windpark located in Clay County, Minnesota and connect to the OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota;
- The new project substation within the Flat Hill Windpark at 70th Avenue N and 120th Street N, northeast of Glyndon in Clay County, Minnesota; and
- The new switching station along the existing OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota.

The 11-mile 230 kV transmission line is a generator outlet necessary to interconnect the wind farm with existing transmission facilities owned by OTP at the designated POI.

3.1.1 Nominal Generating Capability and Economies of Scale (Minn. R. 7849.0250 A (1))

Each turbine will have a net nominal rating of 1.5 MW. With a total of 134 turbines, the Project's nominal generating capacity will be 201 MW. Larger wind projects, such as the Flat Hill Project, can realize economies of scale by spreading out the relatively fixed transaction, operation, and maintenance costs over the project, resulting in decreased costs per kWh of electricity produced. The Applicant expects to gain economies of scale in the following areas: (1) turbine deliveries, pricing and erection; (2) balance of plant construction; (3) substation, collector system, and transmission interconnection design and engineering; and (4) operations, service, and ongoing maintenance.

3.1.2 Anticipated Operating Cycle/Annual Capacity Factor (Minn. R. 7849.0250 A (2))

A net capacity factor of approximately 35-38% is anticipated for the Project, which would provide between 616,000 and 669,000 MWh of electricity. The wind turbines themselves are technologically advanced machines that are very reliable and operate year-round. Based upon the Applicant's experience at other wind farms has shown that they are available to produce power more than 95% of the time.

3.1.3 Fuel Use (Minn. R. 7849.0250 A (3))

The wind turbines will be powered by the wind.

3.1.4 Heat Rate (Minn. R. 7849.0250 A (4))

Heat rates are not applicable to a wind project.

3.1.5 Location (Minn. R. 7849.0250 A (5))

The Flat Hill Windpark will be located in western Minnesota approximately twelve miles east of the City of Moorhead in Clay County, as shown on the Project Map shown in Appendix A. The area is entirely rural with an agricultural-based economy. The Project site was selected based on its excellent wind resources, close proximity to existing transmission infrastructure, the ability to secure the required land, current land use, and other considerations necessary to allow wind power to be generated from the site. The turbines will be placed throughout an area comprising about 11,000 acres in portions of the Townships of Moland, Spring Prairie, Glyndon, and Riverton, east of the City of Glyndon. Less than 65 acres will be taken out of agricultural production as a result of the Project (approximately 0.3 percent of the total available acreage within the Project area). A limited number of rural residences are found in the area, and the turbines will be sited at a minimum of 650 feet from the residences.

3.2 Alternatives (Minn. R. 7849.0250 B)

The overall objective in this alternatives analysis is to determine whether there are other energy sources that can satisfy the need identified in Section 2.1 above. As noted, the Applicant intends to develop a generation source that will aid utilities in satisfying the renewable energy need created by the REO. Therefore, consistent with the Applicant's requested exemptions and the Commission October 16 Order approving the exemptions, non-renewable energy sources have been excluded from this alternatives analysis. The criteria used in the analysis include: (i) is the energy source cost-effective; (ii) is the energy source commercially proven and reliable for the electrical generation output needed; and (iii) is the energy source appropriate for the site selected.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an IPP, like the Applicant. The Applicant does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, as a seller of electricity on the wholesale market, the Applicant must keep its prices – and, thus, its costs – low enough to remain competitive. For these reasons, the Applicant must exercise diligence in deciding where and when to pursue opportunities for capital investment in new wind energy facilities.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the generated power to wholesale customers. Without a guarantee of long-term reliability and cost-effectiveness, it is difficult or impossible to convince customers that an unproven technology should be selected for purchase. At this time, the most cost-effective non-combustible renewable energy resource is wind-powered generation. In recent years, the economics of wind energy have significantly improved with advances in turbine technology, the ability to determine optimum sites and wind farm configuration, and the availability of the Federal PTC. Also, as a result of rising natural gas prices and the corresponding cost increases for on-peak energy prices, wind energy has become an increasingly valuable hedge against natural gas prices.

3.2.1 Purchased Power (Minn. R. 7849.0250 B (1))

The Applicant is an independent power producer and does not purchase power. Instead, the Applicant will sell power to utilities and/or other wholesale purchases of power. Consistent with the Commission's October 16, 2008 Order granting exemptions to the Applicant, this data requirement is not applicable.

3.2.2 Increased Efficiency of Existing Facilities (Minn. R. 7849.0250 B (2))

Increasing efficiency in existing renewable energy generation sites will not meet the demand for renewable energy sources necessary to meet the REO. As an IPP, the Applicant has no existing generation facilities in Minnesota. Consistent with the Commission's October 16, 2008 Order granting exemptions to the Applicant, this data requirement is not applicable.

3.2.3 New Transmission Lines (Minn. R. 7849.0250 B (3))

New transmission lines are not a viable alternative to the Project. The Project was designed to assist Minnesota utilities in meeting their respective REO. Building new transmission lines does not comport with that goal. Consistent with the Commission's October 16, 2008 Order granting exemptions to the Applicant, this data requirement is not applicable.

3.2.4 New Generating Facilities (Minn. R. 7849.0250 B (4))

In its October 16, 2008 Order, the Commission granted a partial exemption from Minn. R. Part 7849.0250 B (4), limiting the consideration of alternative generating facilities of a different size or using a different energy source to only renewable options. Accordingly, the renewable alternatives considered include solar energy, biomass, hydroelectric generation, landfill gas, and fuel cells.

Solar

The cost and reliability of solar power do not compare favorably with the wind generating capacity proposed in this Application due to climate and elevation. As noted in the DOC's 2004 Quad Report, "Solar electric systems are not currently cost-effective for utility applications or strict cost-effective requirements." (MN DOC, 2004 Quad Report, at 28). Currently, the largest solar powered electric systems in Minnesota are 40kW systems, which provide significantly less output than the 201 MW system proposed. For these reasons, solar power is not an alternative to the Project. (*See* Innovative Power Systems, Commercial Project List, http://www.ips-solar.com/ProjectList.html (April 27, 2007)).

Hydro

Hydropower is also not an alternative to the Project. As of 2004, Minnesota had 195 MW of hydroelectric generation, with the largest system generating 75 MW. (2004 Quad Report, at 28). In 1996, the U.S. Department of Energy reported that Minnesota's potential for increasing hydroelectric generation was limited to an additional 137 MW dispersed over 40 sites in Minnesota. (*Id.*). Thus, hydropower would be unable to produce the same output as the currently proposed Flat Hill Project, and developing multiple sites would significantly increase generation costs as compared to the Flat Hill Windpark.

Biomass

A biomass plant is not an alternative to the Project. Biomass generally requires large amounts of waste products, such as waste logging, manufacturing, or trimming residues, which are not readily available in many parts of the state. In addition, biomass electric generation facilities generally have outputs that are much smaller than the proposed 201 MW Project. Finally, biomass facilities would emit carbon dioxide and other Volatile Organic Compounds.

Landfill Gas

A landfill gas plant is not an alternative to the Project. Landfill gas electric generation facilities generally have outputs that are much smaller than the proposed 201 MW Project. As noted in the Department's 2004 Quad Report, "[t]here are currently four landfill gas-to-electricity recovery projects in Minnesota totaling 24.2 megawatts." (2004 Quad Report at p. 27.) Therefore, it would be unreasonable to conclude that landfill gas could produce the same output as the currently proposed Flat Hill Project, even if multiple sites were considered.

Fuel Cells

Fuel cells for electricity generation are not currently economic. Like other emerging technologies, Applicant continues to follow advancements in fuel cell design and application.

3.2.5 Combinations (Minn. R. 7849.0250 B (5))

No combination of the aforementioned alternatives would be appropriate, as they would not enable Minnesota utilities to meet the REO more efficiently or cost-effectively than the Project would and would constitute a greater impact on the State.

3.3 Discussion of Proposed Facility and Alternatives (Minn. R. 7849.0250 C)

In its October 16, 2008 Order, the Commission granted Applicant a partial exemption from the requirement to provide cost data on nonrenewable alternatives since non-renewable alternatives would not fulfill the purpose of the proposed Project. The Commission also exempted Applicant from the requirement to provide system-wide data since the Applicant does not own or operate a system within the meaning of the Rule.

Accordingly, the Applicant limits its response to this data requirement to only those renewable alternatives discussed in response to Minnesota Rules, Part 7849.0250 B (4) that could provide electric power at the established level of need. As discussed above, no such alternatives exist. Therefore, only information regarding the proposed facility is applicable. Notwithstanding this fact, in Table 6 below, Applicant provides information from the Energy Information Administration's June 2008 "Electricity Markets Module," which provides "Cost and Performance Characteristics of New Central Station Electricity Generating Technologies," which includes the renewable sources discussed above.

Table 7 - Cost and Performance Characteristics

Technology	Size (MW)	Total Overnight Cost in 2007 (2006 $/kW)	Variable O&M (2006 mills/kWh)	Fixed O&M (2006 $/kW)
Fuel Cells	10	4,653	46.62	5.50
Biomass	80	2,490	6.53	62.70
Landfill Gas	30	1,773	0.01	111.15
Conventional Hydropower	500	1,410	3.41	13.59
Wind	50	1,340	0.00	29.48
Photovoltaic	5	5,380	0.00	11.37

This Table 7 shows that wind energy resources are competitive with (and superior) to other forms of renewable resources from a cost perspective.

3.3.1 Capacity Cost (Minn. R. 7849.0250 C (1))

Wind energy projects do not have a cost attributable to capacity and thus costs for wind energy facilities are typically not expressed in terms of capacity costs. The Flat Hill Windpark will deliver energy to Minnesota utilities and/or other wholesale purchasers on an as-generated basis and will receive payment only for energy generated. The Applicant, however, has estimated capital costs to be approximately between **[TRADE SECRET BEGINS]** *** **[TRADE SECRET ENDS]**.

3.3.2 Service Life (Minn. R. 7849.0250 C (2))

A service life of twenty years has been assumed in order to estimate annualized capital costs. With proper maintenance, service, and replacement of parts, the expected life of the Project is thirty years. The Applicant is confident that its maintenance program will result in excellent longevity for the Project.

3.3.3 Availability (Minn. R. 7849.0250 C (3))

The Applicant estimates that the Project will be available at least 95% of the year, which is consistent with industry standards and performance at the Applicant's other projects.

3.3.4 Fuel Costs (Minn. R. 7849.0250 C (4))

The Project will be fueled by the wind, which is free. The easements for the wind rights on the land where the turbines are located will require annual rent payments. Nominal purchases of electricity will be necessary to run the Project, with the Applicant ultimately selling the Project's net output.

3.3.5 Variable O&M Costs (Minn. R. 7849.0250 C (5))

Variable maintenance costs will likely be less than **[TRADE SECRET BEGINS]** *** **[TRADE SECRET ENDS]**. An advantage of wind energy facilities is that they typically do not require going offline for maintenance. Individual turbines can be serviced while the rest of the facility continues to deliver energy.

3.3.6 Total Cost (Minn. R. 7849.0250 C (6))

The Applicant has estimated capital costs to be approximately between **[TRADE SECRET BEGINS]** *** **[TRADE SECRET ENDS]**. The actual price for which the Applicant will sell the energy will be determined as a result of negotiations with the purchasing utilities or the price established in the MISO markets, if not sold bilaterally. Any sale of RECs to Minnesota utilities is yet to be determined, and depends upon how the nascent RECs market develops over the next couple years before the Project comes online in December 2010.

3.3.7 Effect on Rates (Minn. R. 7849.0250 C (7))

Minnesota Rules, Part 7849.0250(C)(7) requires an applicant to estimate its proposed Project's "effect on rates systemwide and in Minnesota, assuming a test year beginning with the proposed inservice date." The Applicant has been exempted from this requirement because it does not have a "system" as defined by the Rules and is not a regulated utility with regulated rates for the power it plans to generate. As such, the data are neither available to the Applicant nor necessary to determine need for its proposed Project. Instead, the Applicant submits data on the Project's impact on state or regional wholesale prices.

The Project's energy production will be modest in comparison to the annual energy consumption of Minnesota and the region. As such, the price of the output will have a negligible effect on rates. However,

the Project's output could be purchased by utilities as a partial replacement for generation sources with more volatile pricing, such as natural gas. Thus, the Project could ultimately play a role in stabilizing or lowering rates. Moreover, since Applicant may offer the Flat Hill Windpark's output into the MISO markets as a price taker, it will be dispatched at the lowest cost to ultimate consumers through the economic dispatch of generation resources in the MISO market.

3.3.8 Efficiency (Minn. R. 7849.0250 C (8)).

Because no fuel is burned in the production of energy at the Project, the Applicant submits that this information requirement is not applicable.

3.3.9 Assumptions (Minn. R. 7849.0250 C (9)).

The cost information shared above assumes a net capacity factor of between 35-38%, and assumes that operations and maintenance costs escalate at rates consistent with those of the rest of the economy, such as the consumer price index. Project construction will take between eight and twelve months. The Project has an anticipated commercial operation date of December 2010.

Easements for the wind rights on the land where the turbines will be located will require fixed annual lease payments. Only nominal purchases of electricity will be required to operate the Project. Thus, the projected fuel costs for the Project are expected to change little, if at all, over the Project's expected life.

3.4 Map (Minn. R. 7849.0250 D)

The Applicant has been granted a partial exemption from Minnesota Rules, Part 7849.0250(D), which requires the applicant to include a map showing the applicant's system. As an independent power producer, the Applicant does not have a "system." The information requested is not available to the Applicant or relevant to the determination of need for its proposed Project. Instead, a map showing the Project location is included in Appendix A.

3.5 Other Facility Information (Minn. R. 7849.0250 E)

Not applicable.

4 Peak Demand and Annual Consumption Forecast (Minn. R. 7849.0270)

The Commission has granted Applicant an exemption allowing Applicant to provide regional demand, consumption, and capacity data from credible sources to demonstrate the need for their proposed projects in lieu of the data requirements of Minnesota Rules part 7829.0270. Such information is provided in Section 2.1 of this Application.

4.1 Annual Electrical Consumption Forecast

As discussed in Section 2.1, there is a critical need for additional electricity production capacity in Minnesota and the entire region.

4.2 Estimates of Ultimate Consumers and Consumption

The Applicant submits that this information request is inapplicable.

4.3 Forecast Methodology

As an IPP that has not developed a forecast methodology, the Applicant submits that this information request is inapplicable.

4.4 Forecast Data Base

As an IPP that has no forecast database, the Applicant submits that this information request is inapplicable.

4.5 Assumptions and Special Information

This information request is inapplicable.

4.6 Coordination of Forecasts

This information request is inapplicable.

5 System Capacity (Minn. R. 7849.0280)

The Applicant has been granted a partial exemption from the requirement that it provide information responsive to Minn. R. 7849.0280 related to system capacity. As a newly-formed IPP, the Applicant has no existing system and, therefore, this information request is inapplicable. The Applicant submits regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be generated by the Project. Such information is provided in Section 2.1 of this Application.

6 Conservation Programs (Minn. R. 7849.0290)

Applicant has been granted an exemption from the requirement that it provide information responsive to Minn. R. 7849.0290 related to energy conservation and efficiency programs. As a newly-formed IPP, the Applicant has no existing system and, therefore, submits that this information request is inapplicable. Since the Applicant is not a regulated utility and plans to sell the Project's output on the wholesale market or to utilities pursuant to one or more PPAs, this requirement is inapplicable.

7 Consequences of Delay (Minn. R. 7849.0300)

The Commission has granted Applicant's request for an exemption from the requirement that it provide information responsive to Minn. R. 7849.0300. Minn. Rule 7849.0300 requires an Applicant to discuss the consequences of delay on its system, neighboring systems, and the power pool should the Project be delayed one, two, or three years, or postponed indefinitely. The rule requires this information for three different demand levels as found in Minn. Rules 7849.0270. As an IPP, however, the Applicant has no existing system and, therefore, this information request is inapplicable. Instead, Applicant will address the potential consequences of delay on the MISO/MAPP region and on the ability of Minnesota utilities to meet the REO

The primary consequences of delaying implementation of the Project would be that the Applicant would not contribute to Minnesota utilities' ability to meet the REO. As noted in Table 5 above, every utility subject to the REO must add additional eligible renewable generation by 2010 (Xcel) or 2012 (all other utilities). Delaying the commercial operation of the Flat Hill Project could impede Minnesota utilities' ability to meet the REO in a timely and cost effective manner. Further, delay of the Project would also delay the environmental and economic benefits of the Project described throughout this Application. Delay would result in a lost opportunity to provide a regional infusion of clean, cost-effective renewable energy. Moreover, the local benefits derived from the Project (job, local tax revenue etc.) would be lost. Indeed, as previously noted, construction of the Project is expected to commence in the spring of 2010 and be complete by December 2010. During this time, approximately 100 construction jobs will likely be created. Further, six to eight permanent positions will likely be created to operate and maintain the Project. Delaying the Project could lead to a loss of these significant economic benefits at a time when the consequences of the present economic downturn may still be impacting the state.

With respect to the consequences of delay on the power pool, MAPP's summer capacity deficits are projected to steadily increase from 2008-2017, including a summer capacity deficit of 751 MW in 2010 the Flat Hill Project would come online and a deficit of 1392 MW in 2011. (*See* MAPP 2007 Load and Capability Report (May 1, 2007), which can be found at http://www.mapp.org/content/eia.shtml). Thus, delaying the Project could have a negative impact on the power pool's reserve margin.

Finally, as noted above, the State two largest utilities, Xcel Energy and GRE, have noted that it is in Minnesota utilities' interest to secure renewable energy resources as soon as practical because of the uncertainly with respect to how long the Federal PTC will be available and the competition for limited

resources. Specifically, GRE noted that "[i]n the next five years, the only resource additions indicated in the preferred plan are wind. Since there is no assurance that the federal Production Tax Credit will be extended indefinitely, there is an incentive to acquire wind resources ahead of our needs." (GRE's 2008 Resource Plan at page 9, which can be found at http://www.greatriverenergy.com/projects/future_plans/2008_rp_public.pdf). Similarly, Xcel has stated that "[b]ecause the RES applies to all Minnesota electric utilities, we anticipate there will be substantial growth in renewable resources in the state and significantly increased competition for available resources, the best development sites, and transmission capacity." (See Xcel's December 10, 2007 Renewable Energy Plan at page 21, which can be found at http://www.xcelenergy.com/docs/RenewableEnergyPlan_12.10.2007.pdf, emphasis added). Failure to add additional eligible resources in the near term could jeopardize Minnesota utilities' ability to satisfy the REO over the long-term and raise the cost of energy delivered to consumers.

First, in light of the possibility that the Federal PTCs may not be available in the future, it is important to ensure that needed wind energy facilities are brought online in the near term to increase the likelihood that the PTCs will be available to developers, thereby lowering overall costs of delivered energy to consumers. Finally, bringing wind facilities online in the near term makes sense in light of escalating equipment/turbine costs due to significant increases in steel prices and other construction materials.

8 Generating Facilities - Environmental Information Required (Minn. R. 7849.0310 and .0320)

The Commission has granted Applicant an exemption from the requirement that it provide information responsive to Minn. R. 7849.0320 Parts C and D, and G, which by their terms, relate only to fossil-fuel and nuclear facilities and are inapplicable. Instead, Applicant generally addresses only reasonably viable renewable alternatives to the proposed facility, as well as a summary of some of the impacts to key resources found within the Project area, including visual resources, land use, and wildlife.

Initially, however, as discussed above in Section 3.2, solar, hydroelectric, biomass, landfill gas and fuel cell technologies are not viable alternative to the Project. As noted in the DOC's 2004 Quad Report, "Solar electric systems are not currently cost-effective for utility applications or strict cost-effective requirements." (MN DOC, 2004 Quad Report, at 28). Currently, the largest solar powered electric systems in Minnesota are 40kW systems, which provide significantly less output than the 201 MW system proposed. For these reasons, solar power is not an alternative to the Project. (Innovative Power Systems, Commercial Project List, http://www.ips-solar.com/ProjectList.html (April 27, 2007)).

Hydropower is also not a viable alternative to the Project. As of 2004, Minnesota had 195 MW of hydroelectric generation, with the largest system generating 75 MW. (2004 Quad Report, at 28). In 1996, the U.S. Department of Energy reported that Minnesota's potential for increasing hydroelectric generation was limited to an additional 137 MW dispersed over 40 sites in Minnesota. (*Id.*). Thus, hydropower would be unable to produce the same output as the currently proposed system, and developing multiple sites would significantly increase generation costs as compared to the Flat Hill Windpark.

A biomass plant is not an alternative to the Project. Biomass generally requires large amounts of waste products, such as waste logging, manufacturing, or trimming residues, which are not readily available in many parts of the state. In addition, biomass electric generation facilities generally have outputs that are much smaller than the proposed 201 MW Project. Finally, biomass facilities would emit carbon dioxide and other Volatile Organic Compounds.

A landfill gas plant is not an alternative to the Project. Landfill gas electric generation facilities generally have outputs that are much smaller than the proposed 201 MW Project. As noted in the Department's 2004 Quad Report, "[t]here are currently four landfill gas-to-electricity recovery projects in Minnesota totaling 24.2 megawatts." (2004 Quad Report at p. 27.) Fuel cells and other emerging technologies are also not viable alternatives for the reasons previously discussed.

Finally, Applicant is submitting a Site Permit Application contemporaneous with this Application and anticipates that an environmental review will be done jointly by the Commission for both applications. (On August 29, 2008, Applicant also filed a transmission line route permit application for the radial line that will connect the Project to the transmission grid. That application will include review and supporting analyses of environmental impacts for those items listed in Minn. Rule 7849.5220, Subpart 3.).

8.1 Land Requirements (Minn. R. 7849.0320 A)

The site boundary encompasses an area of approximately 20,000 acres, which includes land for 134 turbines, access roads, and 20 acres that is anticipated to be required for the substation and O & M building (10 acres each). The Project is located on land that is zoned for agricultural use and will remove less than 65 acres from production (approximately 0.3 percent of the total available acreage within the Project area). No relocation of people or businesses will be necessary for the Project. The land requirements are consistent with the requirements for alternative wind projects of a similar size. Typical wind farms will remove approximately one-half to three-quarters of an acre per turbine from agricultural use. The Project will not require any land for water storage or a cooling system. Minimal space will be required in the maintenance facility for the storage of used oil and other lubricants, as well as for spare parts and tools.

8.2 Traffic (Minn. R. 7849.0320 B)

In general, the existing roadway infrastructure in and around the Project area is characterized by county and township roads that provide access to the proposed site. Access to the Project area also includes two-lane paved and gravel roads. Furthermore, many landowners use private single-lane farm roads and driveways on their property.

There is one U.S. Highway south of the Project area. U.S. 10 is three miles south of the Project area and provides east-west access towards Moorhead. MN Highway 9 is located within the eastern edge of the Project area and provides north-south access. There are two County State Aid Highways (CSAHs) within the Project area. CSAH 26 runs east-west along the northern boundary of the Project area. CSAH 19 runs north-south through the middle of the Project area. There are also five County Roads (CRs) within the Project area (CR 68, 93, 91, 88, and 92).

The existing traffic volumes on the area's county highways were obtained from Minnesota Department of Transportation (MnDOT) 2005 traffic volume maps and are documented in Table **8**. The highest existing Annual Average Daily Traffic (AADT) near the Project area is 15,100 vehicles per day along US

Highway 10. The highest existing AADT within the Project area is 1,750 along MN Highway 9. Along the CSAHs within the Project area, the AADTs are below 2,000 vehicles per day. Along the CRs within the Project area, the AADTs are below 300 vehicles per day indicating very low traffic volumes.

Table 8 - Existing Daily Traffic Levels Within The Project Area

Roadway Description	2005 Existing Annual Daily Traffic (AADT)
MN Highway 9	1750
CSAH 26	1600/1100
CSAH 19	75
CR 68	45
CR 93	245
CR 91	90
CR 88	15
CR 92	25

Highway access to the Project area is provided by MN 9 (which runs north-south along the Project area) and U.S. 10 (which runs east-west just south of the Project area). MN 9 intersects I-94 approximately 15 miles south of Glyndon, near the town of Barnsville, Minnesota. Construction and operation of the Project will require the installation of new access roadways. The access roads will connect the towers to existing roadways. The Applicant will work closely with the landowners to locate these access roads to minimize land-use disruptions. Construction traffic will use the existing county and state roadway system to access the Project area and deliver construction materials and personnel. Construction traffic relating to the Project will be perceptible and will add to local traffic, but this will be minimal and temporary. Construction is not anticipated to result in adverse traffic impacts.

The maximum construction workforce is expected to generate approximately 275 additional vehicles per day (75 truck trips/day and 200 small vehicle trips/day) during peak construction times. The addition of

these vehicles will be perceptible; however, the increase will be similar to seasonal variations such as those due to the autumn harvest.

Truck access to the Project is generally served by MN Highway 9 and U.S. Highway 10. Specific additional truck routes will be dictated by the location required for delivery. Additional operating permits will be obtained for over-sized/overweight trucks and cranes.

The operations phase of the Project will require a multi-person maintenance crew driving through the area to monitor and maintain the wind turbines. The maintenance crew will monitor the wind turbines as needed. There would be a slight increase in roadway traffic for occasional turbine and substation repair.

8.3 Fuel for Fossil Fueled Facilities (Minn. R. 7849.0320 C)

Exempted. The Project will be "fueled" by wind.

8.4 Emissions for Fossil Fueled Facilities (Minn. R. 7849.0320 D)

Exempted.

8.5 Water Use (Minn. R. 7849.0320 E)

Wind power plants do not utilize cooling systems. Water requirements are therefore minimal and limited to potable water needs for Project personnel. A well will be installed near the operations building in accordance with applicable regulations.

8.6 Water Discharges (Minn. R. 7849.0320 F)

No wastewater discharges will occur as a result of the construction or operation of the Project except for domestic-type sewage discharges of Project personnel. Temporary sanitary facilities will be provided during construction, and the operations building will include a septic system in accordance with applicable regulations.

8.7 Radioactive Releases (Minn. R. 7849.0320 G)

Exempted. Neither the Project nor any viable renewable alternatives will produce any radioactive releases.

8.8 Solid Waste (Minn. R. 7849.0320 H)

The only solid wastes generated during the operation of the Project will be domestic wastes and used lubricants and other maintenance materials. There will be three types of fluids used in the operation of the wind turbines: gear box oil, hydraulic fluid, and gear grease. The transformers contain mineral oil. Fewer than 20 barrels of petroleum waste will likely be generated annually. Additional maintenance materials, such as oily and greasy rags, packaging, cleaning residues, and light bulbs, will likely generate less than 2 tons per year of solid waste. All wastes will be handled, processed, treated, stored and disposed of properly.

The types and quantities of solid wastes generated by a biomass facility would depend upon the size and type of the facility.

Solid wastes from landfill gas facilities would likely be minimal and consist mainly of used lubricants.

8.9 Noise (Minn. R. 7849.0320 I)

The Project Area is located in a rural, predominantly agricultural area. Sources of background noise audible to rural residents and visitors to the area include wind, agricultural activity, recreation (primarily hunting), and vehicles. General noise level data from the USEPA and National Transit Institute were used to provide a typical sound level range for rural residential and agricultural cropland uses. Typical baseline average day-night sound levels measured in A-weighted decibels [dB(A)] in the Project Area likely range from approximately 38 dB(A) to 48 dB(A)[3]. These 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 may elevate ambient noise levels relative to rural areas with less wind.

The National Safety Council (NSC) recommends no more than 85 dB(A) for eight hours of exposure as the safe limit for farm operations. Industrial standards of the Occupational Safety and Health Administration (OSHA) regulations would apply during construction, operation and maintenance of the Project. Short-term noise issues would be related to construction of the Project; long-term issues would be related to operation of the facility. Noise generated by construction activities would occur intermittently over the construction period during daytime hours and would be generated by an increase in traffic on local roads, as well as heavy equipment operation. Available estimates from other wind farm construction

[3] U.S. EPA. *Protective Noise Levels (Condensed Version of EPS Levels Document).* 1978. PB82-138827.

projects indicate that the maximum noise levels from heavy equipment would be 85 to 88 dB(A) at a distance of 50 feet.[4]

During operation of the Project, noise will be emitted from turbines. The level of noise generated by turbines will vary with the wind speed, speed of the turbine, and distance of the listener from the turbine. Turbines will be sited a sufficient distance from residences to prevent significant noise impacts, and noise levels produced by operation of the turbines will not exceed Minnesota Pollution Control Agency (MPCA) noise standards.

Noise levels provided by the turbine manufacturer (GE) included a 104.5 dBA sound power level at the turbine hub and a 2dB K-safety factor. The K factor describes GE's uncertainty in the 104 dBA sound power level described in their noise specification. Using the above noise specifications it was determined that the setback for an isolated single 1.5 MW GE turbine is approximately 650-700 feet to ensure compliance with the 50 dBA limit.

The results of the screening noise level impact analysis demonstrate the feasibility of the Project to operate in full compliance with the environmental noise regulatory limits as developed by the state of Minnesota for residential areas. The proposed Project will maintain a setback distance of 700 feet. Establishing a setback which is greater than the minimum of 650 feet (discussed above) will create greater public acceptance within the Project site and create a positive working relationship with nearby homeowners.

As noted in the Applicant's Site Permit submitted simultaneously with this Application, the noise levels from the transmission line radial outlet are comparable to the existing noise environment and will have no significant impact on humans or the environment. The level of noise generated by the transmission line conductors depends on conductor conditions, voltage level, and weather conditions. In foggy, rainy, and wet conditions, transmission conductors can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires (less than 50 dBA, which is below the most restrictive permissible noise level from NAC 1 (Table 5-2)). During a heavy rain general background noise is generally greater than the noise from a transmission line. During dry weather noise from the transmission line is faintly audible or inaudible (less than 20 dBA, which is comparable to the level of a whisper).

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[4] Western Area Power Administration, *Environmental Assessment Wind Energy Center, Edgelev Kulm Project, North Dakota.* 2003. DOE/EA-1465.

The main source of audible noise from a substation is due to the operation of the transformers. Transformers produce noise whenever they are energized, and the level of the noise depends on transformer size, voltage level, and weather conditions. Substation noise is generally minimal and nearly constant with slight variation because of operating conditions (cooling fans on or off, etc.). The Noble Flat Hill Windpark I substation and its transformers will be designed and constructed to comply with state noise standards. The substation parcel is surrounded by rural land uses and should not have significant noise impacts on nearby receptors. In addition, a ten acre parcel will be acquired to accommodate the 2.5 acre substation. The larger parcel size will allow for buffer land between the electrical equipment and the adjacent properties.

8.10 Work Force (Minn. R. 7849.0320 J)

Construction of the Project is expected to commence in the spring of 2010 and be complete by December 2010. During this time, approximately 100 construction jobs will likely be created. Six to eight permanent positions will likely be created to operate and maintain the Project.

8.11 Number and Size of Transmission Facilities (Minn. R. 7849.0320 K)

Infrastructure associated with the Project include access roads, step-up transformers, an underground electrical collection system, an approximately 11-mile 230 kV overhead transmission line, a substation, and O&M building and layout areas. The proposed Flat Hill transmission line and associated facilities for which a route permit has been requested include:

- A new single circuit 230 kV transmission line to capture energy generated by the Flat Hill Windpark located in Clay County, Minnesota and connect to the OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota;
- The new project substation within the Flat Hill Windpark at 70th Avenue N and 120th Street N, northeast of Glyndon in Clay County, Minnesota; and
- The new switching station along the existing OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota.

The 11-mile 230 kV transmission line is a generator outlet necessary to interconnect the wind farm with existing transmission facilities owned by OTP at a designated POI.

Transmission planning, designing, engineering, and environmental criteria were used to develop a preferred and alternate transmission route for the proposed transmission line, which is described more fully in the Applicant's pending Route Permit Application. State and local regulatory requirements as well as input from stakeholders were also considered. Preliminary routes for the proposed Transmission Line Project were developed by considering the following:

- Follow existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries when feasible – A primary factor in identifying routes is Minnesota's policy that new right-of-way for a project should be avoided where existing right-of-way can be used. The PUC's rules recognize that nonproliferation is an important consideration in selecting final routes for new transmission (Minn. R. 7849.5910 H and J). Selecting a route that would result in completely new right-of-way would run counter to the nonproliferation policy. The Applicant used geographic information system (GIS) mapping and field verification to identify existing rights-of-way (transmission lines, pipelines, railroads, roads, etc.), and natural division and field boundaries.

- Minimize length – Minimizing the length of a route generally decreases its impacts on the environment. In some situations, however, a longer route or route segment is chosen to avoid specific, undesirable impacts.

- Avoid populated areas where feasible – One of the most common comments received at the Applicant's public meetings was that residences should be avoided where possible.

- Avoid major environmental features where feasible – Major natural features such as non fragmented forest land, threatened and endangered species, water bodies and wetlands, and biodiversity areas identified by the Minnesota County Biological Survey (including Wildlife Management Areas (WMAs), Scientific and Natural Areas (SNAs), and State Game Refuges (SGRs)) were identified, mapped, and avoided.

- Avoid airports and other conflicting land uses – The Applicant worked with federal and state agencies, and local governments to identify and map land uses that could conflict with the Proposed Project. These included airports, WMAs, SNAs, SGRs, State Parks, trails, and sensitive Nature Conservancy management areas. These land uses were avoided.

In addition, consideration was given to comments received during a meeting with PUC and the Department, a meeting with state and federal environmental agencies, and numerous agency communications which echoed many of the points discussed above. These comments included:

- Utilize existing rights-of-way where feasible.

- Avoid or minimize impacts to water resources and wildlife.

- Avoid or minimize conflicts with adjacent land uses such as forestry and sensitive species.

- Avoid or minimize impacts to cultural resources.
- Avoid or minimize impacts to businesses.

The proposed Flat Hill Windpark project substation location was chosen due to its central location within the proposed windpark development area, and the relationship of the site to the anticipated point of interconnection with the OTP Sheyenne-Audubon 230 kV transmission line.

9 Transmission Facilities (Minn. R. 7849.0330)

The Applicant has been granted an exemption from the requirement that it provide certain information responsive to Minn. R. 7849.0330. Transmission facilities are not true alternatives to the proposed facility, since the purpose of the facility is to increase the supply of renewable energy to assist Minnesota utilities meet their REO obligations.

Notwithstanding this exemption, Applicant provides information responsive to Minn. R. 7849.0330 with respect to its 230 kV radial line necessary to interconnect the Project to the bulk transmission system.

As noted above, infrastructure associated with the Flat Hill Project includes access roads, step-up transformers, an underground electrical collection system, an approximately 11-mile 230 kV overhead transmission line, a substation, and O&M building and layout areas. The proposed Flat Hill transmission line and associated facilities for which a route permit has been requested include:

- A new single circuit 230 kV transmission line to capture energy generated by the Flat Hill Windpark located in Clay County, Minnesota and connect to the OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota;
- The new project substation[5] within the Flat Hill Windpark at 70th Avenue N and 120th Street N, northeast of Glyndon in Clay County, Minnesota; and
- The new switching station along the existing OTP Sheyenne-Audubon 230 kV transmission line southeast of Glyndon, Minnesota.

The 11-mile 230 kV transmission line is a generator outlet necessary to interconnect the wind farm with existing transmission facilities owned by OTP at a designated POI. A diagram of the proposed route and associated infrastructure is included at Appendix B. Additional information is available in Applicant's pending Route Permit Application.

[5] The new project substation within the Flat Hill Windpark in Clay County, Minnesota would occupy approximately 2.5 acres in the southwest corner of a ten-acre parcel currently used by Daniel and Sandra Skolness for agricultural purposes. The 230/34.5 kV substation will be designed to accommodate the incoming 34.5 kV collector lines and the outgoing 230 kV line. The parcel would be acquired by Noble for the facility.

9.1 Overhead Transmission Line. (Minn. R. 7849.0330 A)

No reasonable alternatives to the proposed 230 kV radial line are available. The Project must export its generation to the transmission grid at 230 kV to minimize losses and interconnect with the existing OTP 230 kV system, and the use of a 230 KV radial line is the most economical means of delivering the Project's generation to the transmission grid. Use of any line sized above or below 230 kV would require transformation to deliver power onto the existing OTP system – which is a critical point of interconnection. The OTP 230 kV system provides necessary access to the MISO market since OTP is a MISO member and, therefore, the system would support the needed electric transfer requirement to reach load centers, such as the Twin Cities.

While direct current (DC) transmission lines have been built throughout the world, with two in service in the upper Midwest, DC transmission is not a reasonable alternative to the proposed transmission line. DC transmission lines normally consist of two current-carrying conductors instead of the three associated with an alternating current (AC) configuration. Therefore, the cost of the transmission line itself is typically less than an AC transmission line of similar size. However, DC technology does not integrate easily into the existing AC transmission system. All utility-scale generators produce electricity using AC technology. Alternating current must be rectified (converted) to direct current to be transported over a DC line, and at any point where the DC line connects with the AC transmission system the power must be reconverted to AC. These conversion stations are very expensive and usually exceed any cost savings associated with the DC line itself. The cost of conversion stations is justified only when power is transported over long distances of several hundred miles, without intermediate AC connections.

9.1.1 Schematic Diagrams (Minn. R. 7849.0330 A (1))

The Applicant proposes to construct single-circuit portions of the transmission line using predominantly Hframe 230 kV structures embedded in a 24-inch to 36-inch diameter holes augured to a depth of approximately 10 to 15 feet. The H-frame's poles would be set approximately 20 feet apart in the augured holes, which would then be backfilled with native soils or granular material. H-frame structures are suitable for single-circuit construction in areas requiring longer spans to avoid or minimize the placement of structures in wetlands or waterways. Each H-frame would range in height from approximately 70 to 90 feet and be placed approximately 600 to 1,000 feet apart. Corner structures would either be on reinforced concrete drilled shaft foundations or would be direct embedded with guy wires, depending on soil types and route angles. Either single or multiple pole structures may be utilized as angle structures. The Applicant proposes to use single-pole self-supporting structures set on reinforced concrete drilled shaft

foundations for double-circuit portions of the transmission line. Single-pole self-supporting structures may also be used for single-circuit portions of the transmission line in areas where the available width of the right-of-way is limited by existing infrastructure or development. The height of single-pole single-circuit structures would range from approximately 80 to 100 feet, with the span between structures approximately 300 to 600 feet apart. Double-circuit single pole structures would range n height from approximately 95 to 115 feet with the span between structures approximately 350 to 700 feet.

Graphics depicting the likely structures to be used for the transmission line are included in Appendix C. Graphic 4-1 illustrates the typical 230 kV H-frame structures being considered for the route alternatives. Graphic 4-2 illustrates the typical 230 kV single-pole structure. Graphic 4-3 illustrates a conceptual design for a 230/23.5 kV single-pole double-circuit structure. These graphics were included with Applicant's Route Permit Application (Docket No. IP6687/TL-08-988).

9.1.2 Electric and Magnetic Fields. (Minn. R. 7849.0330 A (2))

Electric Fields

Voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with a high voltage transmission line extends from the energized conductors to other nearby objects such as the ground, towers, vegetation, buildings and vehicles. The electric field from a power line gets weaker as one moves away from the line. Nearby trees and building material also greatly reduce the strength of power line electric fields.

The intensity of electric fields is associated with the voltage of the line and is measured in kilovolts per meter (kV/M). Power line electric fields near ground are designated by the difference in voltage between two points (usually one meter). Applicant's Route Permit Application pending in Docket No. IP6687/TL-08-988 provides the electric fields at maximum conductor voltage for the proposed 230 kV transmission line. Maximum conductor voltage is defined as the nominal voltage plus five percent.

The proposed 230 kV transmission line will have a maximum magnitude of electric field density of approximately 4.66 kV/M underneath the conductors one meter above ground level. This is significantly less than the maximum limit of 8 kV/M that has been a permit condition imposed by the Minnesota EQB under the authority that it previously held in other HVTL applications. The Minnesota EQB standard was designed to prevent serious hazard from shocks when touching large objects, such as tractors, parked under extra high voltage transmission lines of 500 kV or greater. Therefore, the Project would not have direct or indirect effects associated with electric fields.

Magnetic Fields

Current passing through any conductive material, including a wire, produces a magnetic field in the area around that material. The magnetic field associated with a HVTL surrounds the conductor and decreases rapidly with increasing distance from the conductor. The magnetic field is expressed in units of magnetic flux density, expressed as gauss (G).

The Proposed Project would have a peak magnitude of magnetic field density of approximately 335 milligaus (mG) underneath the conductors. The magnetic field densities drop to less than 50 mG within 80 feet of the center line of the transmission structure. The predictions were calculated using the line amperage maximum capacities. This conservatively over-predicts the magnetic fields that would be generated under normal operation. According to the EPA, these densities represent smaller magnetic fields than those associated with many household appliances. Therefore, the Proposed Project would not have direct or indirect effects associated with magnetic fields.

The question of whether exposure to power-frequency (60 Hertz) magnetic fields can cause biological responses or even health effects has been the subject of considerable research for the past three decades. The most recent and exhaustive reviews of the health effects from power-frequency fields conclude that the evidence of health risk is weak. The National Institute of Environmental Health Sciences (NIEHS) issued its final report, "NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields", on June 15, 1999, following six years of intensive research. NIEHS concluded that there is little scientific evidence correlating extra low frequency electric and magnetic field (EMF) exposures with health risk.

The Minnesota Environmental Quality Board (EQB) under the authority that it previously held has addressed the matter of EMF with respect to new transmission lines in a number of separate dockets. See e.g., Docket Nos. 03-64-TR-Xcel (the Lakefield 161 kV transmission line); 03-73-TR-Xcel (the Buffalo Ridge 345 kV transmission line); 04-84-Tr-Xcel (the Buffalo to White 115 kV transmission line); and 04-81-TR-Air Lake-Empire (a 115 kV transmission line in Dakota County). The findings of the EQB and the discussion in the Environmental Assessments prepared on each of those projects are pertinent to this issue with respect to this Proposed Project. Documents from those matters are available on the PUC webpage.

In Docket No. 03-73-TR-Xcel for the Buffalo Ridge 345 kV transmission line, the EQB made the following findings with regard to EMF:

> 118. No significant impacts on human health and safety are anticipated from the project. There is at present insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects. The EQB has not established limits on magnetic field exposure and there are no Federal or Minnesota health-based exposure standards for magnetic fields. There is uncertainty; however, concerning long-term health impacts, and the Minnesota Department of Health, the EQB and Xcel all recommend a "prudent avoidance" policy in which exposure is minimized.
>
> 119. In previous routing proceedings, the EQB has imposed a permit condition on HVTL permits limiting electric field exposure to 8 kV/m at one meter above ground. This permit condition was designed to prevent serious hazard from shocks when touching large objects, such as semi trailers or large farm equipment under extra high voltage transmission lines of 500 kV or greater. Predicted electric field densities are less than half of the 8 kV/m permit condition for both the 345 kV transmission line and the 115 kV transmission line.

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.

Stray Voltage.

Stray voltage is defined as a natural phenomenon that can be found at low levels between two contact points in any animal confinement area where electricity is grounded. By code, electrical systems, including farm systems and utility distribution systems, must be grounded to the earth to ensure continuous safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When a portion of this NEV is measured between two objects that may be simultaneously contacted by an animal, it is frequently called stray voltage. Stray voltage is not electrocution, ground currents, EMFs or earth currents. It only affects farm animals that are confined in areas of electrical use. It does not affect humans.

Stray voltage has been raised as a concern on some dairy farms because it can impact operations and milk production. Problems are usually related to the distribution and service lines directly serving the farm or the wiring on a farm. In those instances when transmission lines have been shown to contribute to stray voltage, the electric distribution system directly serving the farm or the wiring on a farm was directly under and parallel to the transmission line. These circumstances are considered in installing transmission lines and can be readily mitigated. Appropriate measures will be taken to prevent stray voltage problems when the Proposed Project parallels or crosses distribution lines.

9.1.3 Ozone and Nitrogen Oxide Emissions. (Minn. R. 7849.0330 A (3))

The primary air quality concerns related to transmission lines are ozone and nitrogen oxide emissions surrounding the conductor due to "corona discharge". "Corona discharge" is when a thin layer of air molecules around the conductors becomes electrically charged, and during wet conditions, conducts electricity. This phenomenon produces a small amount of ozone, however, the amount of ozone produced is likely in the same range of that produced by a lightening storm. Furthermore, moisture (the same factor that increases corona discharge from the transmission lines) inhibits the production of the ozone.

The Environmental Protection Agency (EPA) has regulations regarding permissible concentrations of ozone and oxides of nitrogen (62 Federal Register 38856). The national standard is 0.08 parts per million (ppm) on an eight-hour averaging period (40 CRF Part 50). The Minnesota state standard is 0.08 ppm based on the fourth highest 8-hour daily maximum average in one year (Minn. R. 7009.0080). Incremental concentrations of ozone due to corona would be expected to be in the order of one-tenth of the standard near the transmission line (0-8 parts per billion), and insignificant at ground level.

Temporary and localized impacts to air quality are likely to occur during construction due to emissions for construction vehicles and fugitive dust from clearing activities. The magnitude of construction emissions will vary according to weather and phase of construction, but will be minimal and temporary. Adverse impacts to the surrounding environment will be minimal because of the short duration of emissions and dust producing phases of construction.

9.1.4 Radio and Television Interference. (Minn. R. 7849.0330 A (4))

Corona from transmission line conductors can generate electromagnetic "noise" at the frequencies at which radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side. FM radio receivers usually do not pick up interference from transmission lines. Television interference is rare, but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. If interference occurs at a residence because of the radial line, Applicant will remedy the problem so that reception is restored to its original quality.

9.1.5 Audible Noise. (Minn. R. 7849.0330 A (5))

Transmission lines will produce noise under certain conditions. The level of noise depends on weather conditions and voltage level. Noise emission from a transmission line generally occurs during wet conductor conditions. In wet weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During dry weather, audible noise from transmission lines is barely perceptible. The radial line will be designed and constructed to comply with state noise standards.

9.2 Underground Transmission. (Minn. R. 7849.0330 B)

Transmission lines can be placed underground, but at a cost substantially higher than overhead construction. The 230 kV overhead radial line for this Project is expected to cost $400,000/mile. An equivalent underground transmission line would cost roughly $1,000,000/mile. This cost differential is based on the different design requirements for overhead and underground lines. Overhead transmission lines rely on the dielectric properties of air to provide insulation, thereby preventing the occurrence of a short circuit. The properties of the air also efficiently dissipate heat away from the conductor surface.

When a transmission line is placed underground, the conductors must be adequately insulated from the ground and each other, and adequately cooled to prevent equipment failure. Wrapping the conductors with insulating materials and placing them inside oil-filled pipes accomplish this. The oil is circulated through cooling stations every few thousand feet along the line.

Some electric cables have been designed with a specially formulated plastic covering that does not require circulating oil to dissipate heat. However, the amount of current that can be applied to such conductors is limited. Because of the significantly greater expense associated with underground transmission, the use of underground technology is limited to locations where the impacts of overhead construction are completely unacceptable, or where physical circumstances allow for no other option.

9.3 Rights of Way (Minn. R. 7849.0330 C)

Applicant's Route Permit application pending in Docket No. Docket No. IP6687/TL-08-988 provides a detailed description of the proposed line routes, environmental impacts and alternatives. As noted therein, the Applicant has requested that an 11.4-mile route be approved for preferred Route 1 that has, on average, a 150-foot width from the centerline of the designated route (a total corridor width of 300 feet). This will give Applicant reasonable flexibility in locating the transmission line. This 300-foot width has

been identified on the segment maps in Appendix A of the Route Permit Application. Typical right-of-way for a 230 kV transmission line would be 62.5 feet on either side of the project centerline, but actual right-of-way acquired from landowners for the Proposed Project may vary depending upon where the line is located. Preferred Route 1 generally follows MN Highway 9 road right-of-way from the Flat Hill Windpark substation to the existing OTP Sheyenne-Audubon 230 kV transmission line located on the north side of 50th Avenue South (Highway 12) southeast of Glyndon, Minnesota. Table 9 summarizes the corridor sharing along the proposed preferred Route 1 and alternative Route 2.

Table 9 - Corridor Sharing.

Route	Length (miles)	Existing Transmission right-of-way (miles)	Railroad right-of-way (miles)	Highway right-of-way (miles)	County/Township Road right-of-way (miles)	No Corridor Sharing (miles)
Route 1	11.4	5.0	0	4.05	2.35	0
Route 2	9.9	0	3.5	0	1.6	4.8

9.4 Transmission Line Design and Construction (Minn. R. 7849.0330 D).

Construction is planned to begin once the acquired approvals are obtained and easement acquisition is completed. A detailed construction schedule will be developed based upon availability of crews, outage restrictions for lines that may be affected, weather conditions, and any restrictions placed on certain areas for minimizing permanent impacts from construction.

Prior to initiating construction, the Applicant will advise affected property owners of the construction schedule, needed access to the site, and any vegetation clearing required for the Proposed Project. Once access to the land is granted, preparation of the right-of-way for construction begins in coordination with landowners. Underground utilities would be identified and located in cooperation with local utility companies to minimize conflicts to the existing utilities along the route. The right-of-way will be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed transmission route, consistent with standard vegetation management guidelines. Generally, these guidelines require removal of existing vegetation with a mature height of greater than 25 feet from within the area 25 feet either side of the centerline of transmission poles, but the amount of clearing may vary depending upon the ultimate structure type used for the transmission line.

Efforts will be made to stage construction within the right-of-way areas and in previously-disturbed areas, to the extent possible. If additional areas are needed temporarily for construction, temporary easements would be obtained from affected landowners.

Construction methods and practices utilized during line installation will be consistent with local utility, as well as local, state, NESC and Noble standards for line construction, setbacks, erosion control, etc. During construction, efforts will be made to limit vegetation removal and ground disturbance, to minimize erosion and runoff. Temporary silt fence, sedimentation ponds, and other measures may be utilized to prevent sediment from running off into wetlands or other surface waters.

A stable working surface is required at structure locations. Timber mats are commonly used to provide a working surface in unstable soils. Structures are normally assembled on the ground along with insulator assemblies and single-leader p-line ropes and then raised into position. For direct embedment type structures, the poles are set in augured holes with large rubber-tired or tracked cranes. The annular space between the pole and the augured hole is backfilled with native soils if suitable or with granular materials.

Where reinforced concrete foundations are required, large rubber tired or track mounted auger equipment is used to excavate a circular hole of the appropriate diameter and depth. In upland areas, excavated material would be spread evenly around the structure base to promote site drainage. Reinforcing steel and anchor bolts are set in position. Ready-mixed concrete is then placed in the excavation. In wetland areas, a telescoping temporary steel caisson would be placed in the foundation hole to stabilize the soil walls. Concrete is placed in the excavation using the tremie method. Water pumped from the excavation would be discharge into a controlled or vegetated upland area. Concrete truck wash water would be discharged only in specially designated upland disposal areas or at the concrete batch plant.

After the concrete is poured, the steel caisson is removed. In some situations, a permanent caisson may be required to stabilize the excavation. During drilling, a minimal amount of granular material (from an outside source) would be placed in the area between the caissons and the timber mats (if required at that location) to provide safe footing for construction personnel. During final restoration, the granular material is leveled or removed to restore the original ground contours for re-vegetation of native species. After the foundation concrete is placed, excess excavated materials would be transported to a suitable upland site by truck for disposal. After allowing adequate curing time, the steel pole structure base plates are bolted to the concrete foundations.

The wire stringing process starts in a setup area prepared to accommodate the stringing equipment and materials, normally located mid-span on the centerline of the right-of-way. The rope machine, new conductor wire trailers, and tensioner are located at the wire stringing set-up area. This phase of construction occurs after the structures have been erected, and fitted with stringing blocks (also called dollies or sheaves) and with single-leader "p-line" ropes that reach the ground. Stringing blocks are a type of pulley that attaches to the insulator assembly and temporarily support a pulling rope or "p-line" and a wire rope or "hard line," which in turn supports the conductor before it is permanently "clipped in."

The process starts as the construction crew pulls the p-lines toward the first structure beyond the setup area. The p-lines are normally pulled down the right-of-way with a small wide-track bombardier or other small equipment. At each structure, the ropes are detached from the bombardier and attached to the single leader p-line to lift the ropes up into the dollies. Then the ropes are reattached to the bombardier and driven to the next structure for the same process. After the p-line has been strung through all the structures for all phases within the stringing interval, the pulling ropes are attached to a hard line and pulled, one at a time, back through the dollies to the beginning of the interval. A hard line set-up is located at the opposite end of the interval from the wire stringing setup area. Each hard line is then attached to the conductor wire with an attachment called a "sock," which is pulled back through the dollies to the end of the interval.

Crewmembers travel along the access route in a pickup truck, follow the "sock" as it is being pulled to make sure it does not get hung up in the dollies. One at a time, the conductor wires are then pulled to the appropriate tension and clipped into place utilizing permanent suspension hardware. Wire stringing and hard line setup areas are normally located in upland areas during spring, summer or fall conditions. During winter when frozen conditions provide a stable working surface, set-ups may be located in wetland areas. If set-ups in wetlands are required when surface conditions are not stable, extensive use of timber matting is required.

The most effective means to minimize impacts to water areas during construction is to span streams and rivers by placing structures above the normal high water level. In general, construction equipment is permitted to be driven across waterways except under special circumstances. If such circumstances occur, discussions with the appropriate resource agency will be pursued. Where waterways must be crossed by construction equipment the Applicants would use temporary wood mats and culverts to minimize the impact on the waterway. For those waterways which cannot be crossed with construction equipment, workers might walk across or use boats during wire stringing operations to pull in the new conductors and

shield wires or in the winter drive equipment across the ice. In areas where construction occurs close to waterways, appropriate measures would be employed to minimize soil erosion and prevent sedimentation of the waterways. The applicants would ensure that equipment fueling and lubricating occur at a reasonable distance from the waterways.

9.5 Maintenance Practices. (Minn. R. 7849.0330 E).

Maintenance of the line would require access to the transmission line's right-of-way to perform periodic inspections, conduct maintenance, and repair damage. Regular maintenance and inspections would be performed during the life of the transmission line to ensure its continued integrity. Inspections would be limited to the right-of-way and to areas where obstructions or terrain may require off-right-of-way access. If problems are found during inspection, repairs would be performed and the landowner would be compensated for any loss.

The right-of-way would be managed to control vegetation that interferes with the operation and maintenance of the transmission line. Portions of the proposed transmission line route would be in wooded areas, requiring tree maintenance to maintain the integrity of the transmission line. Native shrubs that would not interfere with the safe operation of the transmission line would be allowed to reestablish in the right-of-way. The Applicant would implement a standard practice of inspecting the transmission line on a two-year cycle to determine if clearing is required. Right-of-way clearing practices include a combination of mechanical and hand clearing, along with herbicide application where allowed, to remove or control vegetation growth. Noxious weed control with herbicides would be conducted on a two-year cycle around structures and anchors, where approved for use.

9.6 Work Force (Minn. R. 7849.0330 F).

Applicant estimates that approximately 150 workers will be needed for the construction of the transmission facilities and approximately 10 workers for operation and maintenance of the transmission facilities.

9.7 Environment and Land Use Inventory and Permitting. (Minn. R. 7849.0330 G)

Minn. Rule 7849.0330 specifies that a CON application provide information concerning (1) hydrologic features; (2) natural vegetation and associated wildlife; (3) physiographic regions; and (4) land-use types.

The Proposed Project area is situated within the Red River Prairie Subsection, which covers 3,985,620 acres (6,173 square miles) in northwestern Minnesota, representing approximately 7 percent of Minnesota. The western boundary of this subsection is formed by the Red River. The eastern boundary follows the eastern limits of continuous tall grass prairie vegetation at the time of Euro-American settlement. Portions of a till plane are included. The southern boundary follows the southern end of the till plain and the Glacial Lake Agassiz basin.

The majority of the Red River Prairie Subsection is a glacial lake plain with silty, sandy, and clayey lacustrine deposits. It is level, uniform, and featureless, broken only by wetlands, meandering waterways, and old beach ridges. Drainage is to the north via the Red River and its tributaries. The major landform is a large lake plain (Glacial Lake Agassiz). Minor landforms include till plain, beach ridges, sand dunes, and water-reworked till. The greatest depth of lake laid sediments is present along the Red River, which forms the western boundary. Lacustrine origin sediments thin to the east, where glacial till was leveled and reworked with little deposit of lacustrine sediments. Topography is level to gently rolling. There is some steeper topography along drainages and adjacent to Lake Traverse.

The most important land use in this area is agriculture. Due to the extensive agricultural use in the area, the lake plain has been intensively ditched. Some native flora persists in small fragments (in some moderate size) east of the beach ridges and in the interbeach zone. Native flora consists of tallgrass prairie and wet prairie that is dominated by bluestems (Andropogon scoparius and A. geradii), Indian grass (Sorghastrum nutans), bluejoint grass (Calamagrostis canadensis), cordgrass (Spartina pectinata), cattails (Typha spp.), rushes (Juncus spp.), and sedges (Carex spp.). Narrow forested areas that consist of cottonwood (Populus deltoids), elm (Ulmus spps.) and willow (Salix spp.) are common along larger streams and rivers. Precipitation averages between 21 to 23 inches, with the lowest amounts at the southwestern edge of the subsection. About half of the precipitation arrives during the growing season. The growing season ranges from 111 to 136 days.

Based on 2000 US Census Bureau (2006a) data, Clay County encompasses 1,053 square miles, averaging 48.7 persons per square mile. The statewide average population density was 61.8 persons per square mile, covering 87,014 square miles. Clay County is located in west-central Minnesota, and land use in the Proposed Project area is predominately agricultural land. Other minor land uses include pasture land, wetland, mining, and forested land. The transmission line corridor is located in a rural setting with scattered residences northeast of the town of Glyndon, and northwest of the town of Hawley. Most of

preferred Route 1 will follow MN Highway 9, running north to south. The transmission line would run through Spring Prairie Township and Riverton Township.

The majority of the transmission line will follow areas zoned "Agricultural Preservation District" (AgP-1), (Clay, 2005). "Agricultural Preservation" is intended to preserve and promote the use of land for agricultural purposes and to protect it from encroachment by non-agricultural development. A portion of the project corridor will include areas zoned "Flood Hazard Zones", these areas are related to the floodway and flood fringe associated with the Buffalo River. The preferred Route 1 transmission line will avoid crossing through the town of Glyndon and any area zoned within Glyndon Township. (A discussed above, alternative Route 2 for the transmission line has been submitted with the Route Permit Application pending in Docket No. IP6687/TL-08-988). The proposed transmission line and substation/switching station would be built largely within or adjacent to existing public road right-of-way areas which are already unavailable for mining activities. Therefore, the Proposed Project would not result in mining impacts.

10 Alternative of No Facility (Minn. R. 7849.0340)

Minn. R. 7849.0340 requires the applicant to provide information on the alternative of no facility for each of the three levels of demand specified in Minnesota Rules part 7849.0300. The Commission, however, granted Applicant a partial exemption from this rule, such that Applicant is only required to provide information regarding the impact on the wholesale market if the Project is not built.

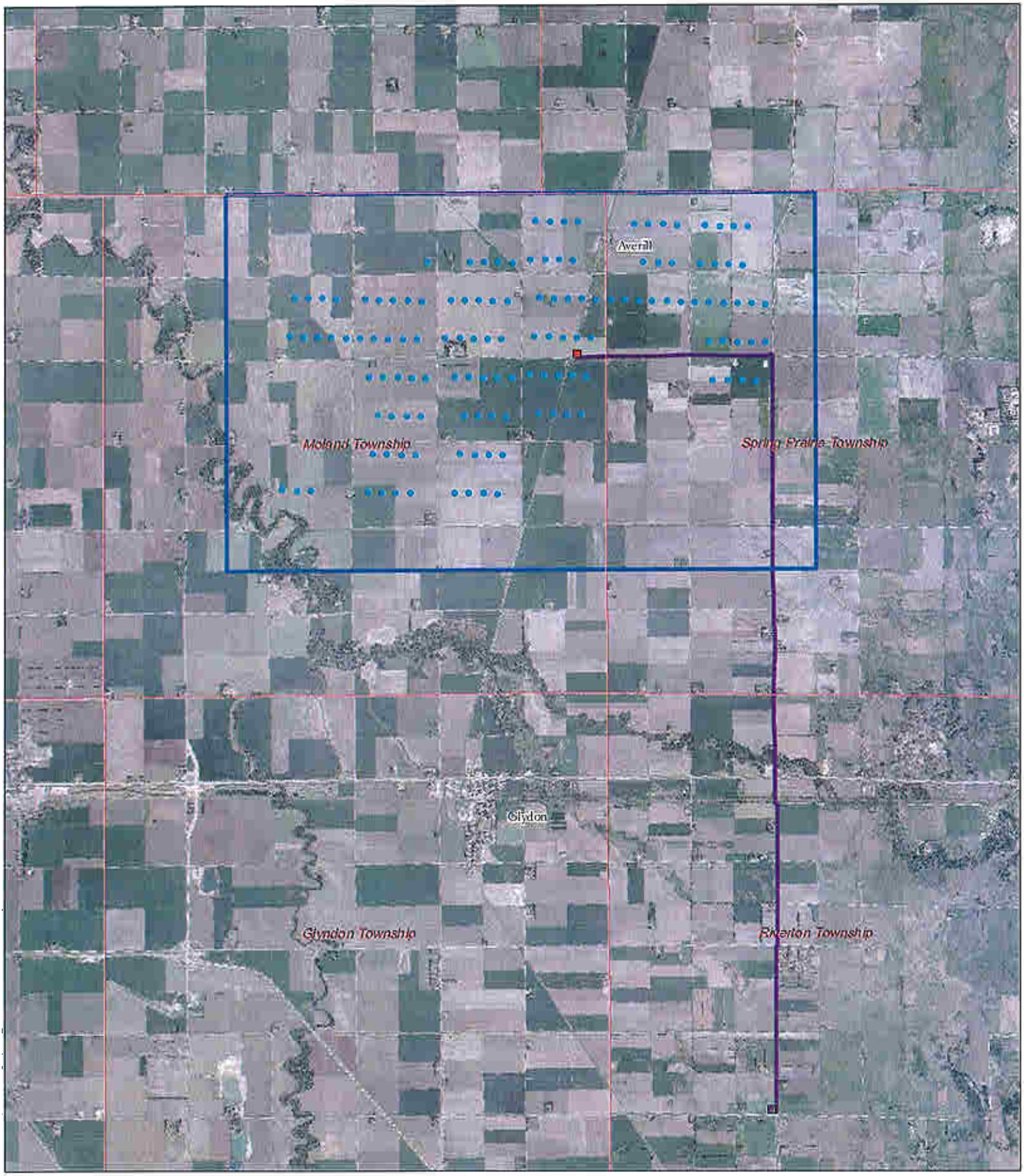
Given that the proposed Project is designed to increase the amount of energy available for purchase on the wholesale market that will satisfy Minnesota utilities' REO obligations, not building the facility is not an alternative. Not building the facility would result in no increase in renewable energy and, in turn, no opportunity for utilities to purchase the Project's output to satisfy the REO. Such an outcome is contrary to Applicant's objective for the Project, and will not satisfy the state and regional need for renewable energy outlined in Section 2.1 above.

Moreover, the "no facility" alternative could lead to higher prices for wholesale energy than would otherwise be paid if the Flat Hill Project was not built. As noted above, in the absence of a PPA, the Applicant will likely offer the Flat Hill Project's output into the MISO energy market as a "price taker" – that is – it will bid $0 into the market and be paid the market clearing price. This "merchant wind" model has been used by Noble in other organized markets and ensures that the wind facility is dispatched at the lowest possible cost for consumers. The economic dispatch of the Flat Hill Project could displace other most costly generation resources on the margin. Finally, if the output of the Project is purchased through a PPA, the facility would be scheduled in the energy market potentially displacing more costly resources.

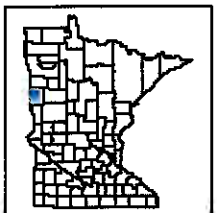
Appendix A

Application For Certificate of Need of
NOBLE FLAT HILL WINDPARK I, LLC

Docket No. IP-6687/CN-08-951



Source: Map adapted from 2003-2004 Farm Services Administration (FSA) Color.



- Preliminary Turbine Locations
- Noble Flat Hill Windpark I Substation
- Route 1 Switch Station
- Route 1
- Project Boundary
- Township Boundary

0 0.5 1 1.5 2 Miles

Figure 2
Preliminary Wind Turbine Siting Plan
Site Permit Application
Noble Flat Hill Windpark I, LLC

N

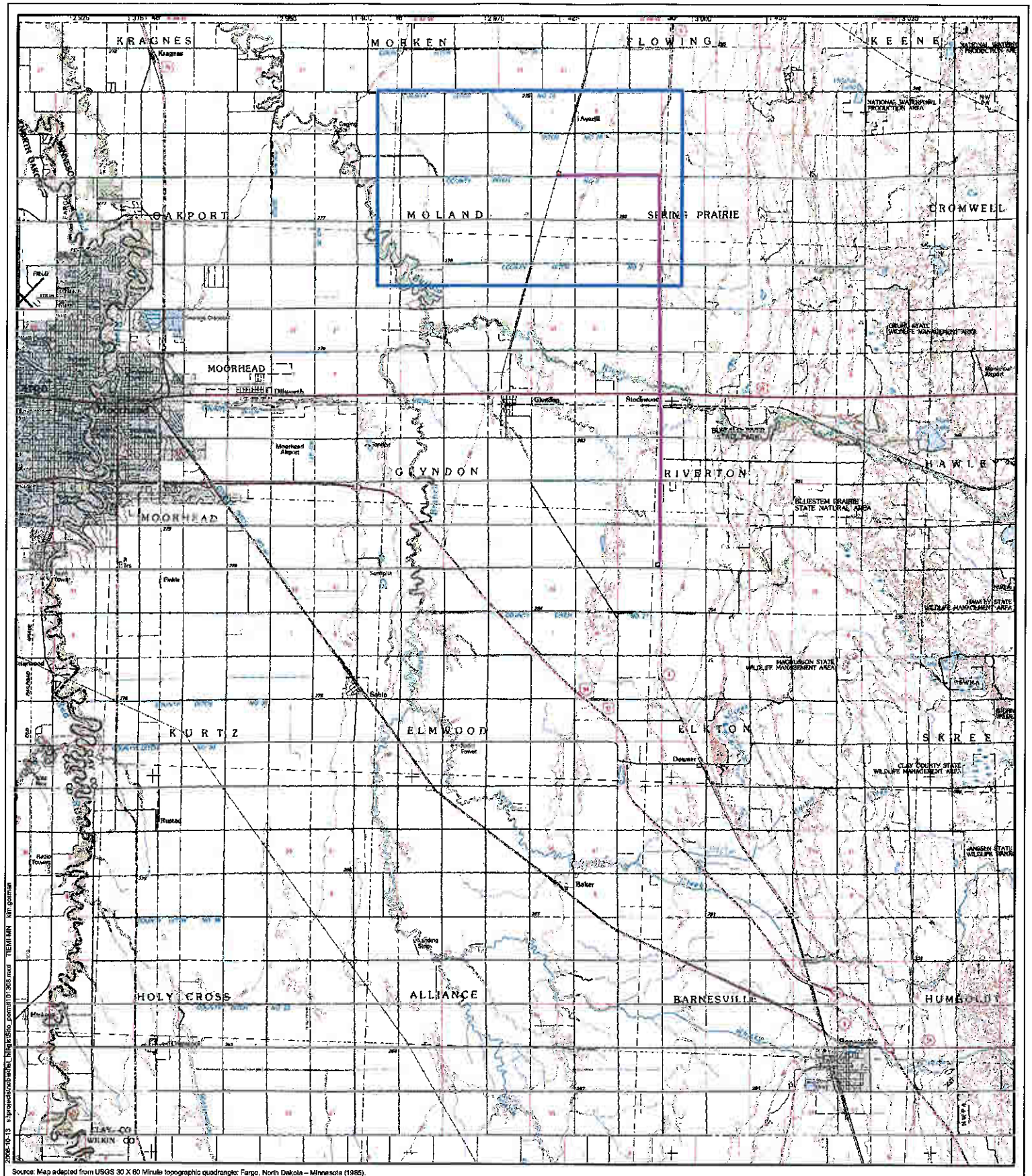
TETRA TECH

Noble
POWER WHERE IT MATTERS

Appendix B

Application For Certificate of Need of
NOBLE FLAT HILL WINDPARK I, LLC

Docket No. IP-6687/CN-08-951



Source: Map adapted from USGS 30 X 60 Minute topographic quadrangle: Fargo, North Dakota – Minnesota (1985).

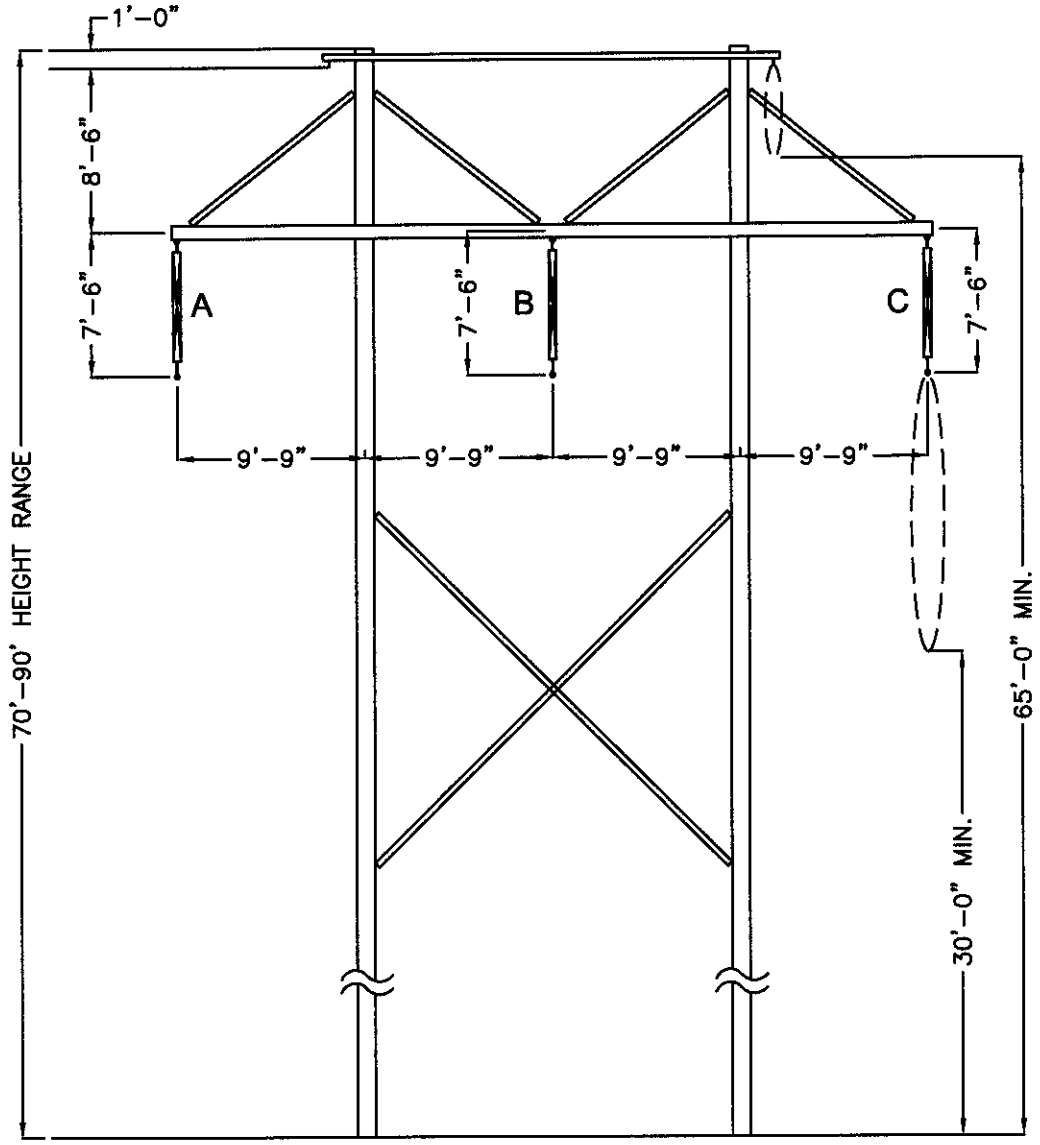
Figure 1
Project Vicinity
Site Permit Application
Noble Flat Hill Windpark I, LLC

Appendix C

Application For Certificate of Need of
NOBLE FLAT HILL WINDPARK I, LLC

Docket No. IP-6687/CN-08-951

230 kV H–Frame



NOTE: WE ANTICIPATE THAT THE PROJECT WOULD USE 795 ACSR (ALUMINUM CONDUCTOR, STEEL REINFORCED, NON–BUNDLED), WITH A CAPACITY OF APPROXIMATELY 440 MVA (MEGA VOLT AMPERES).

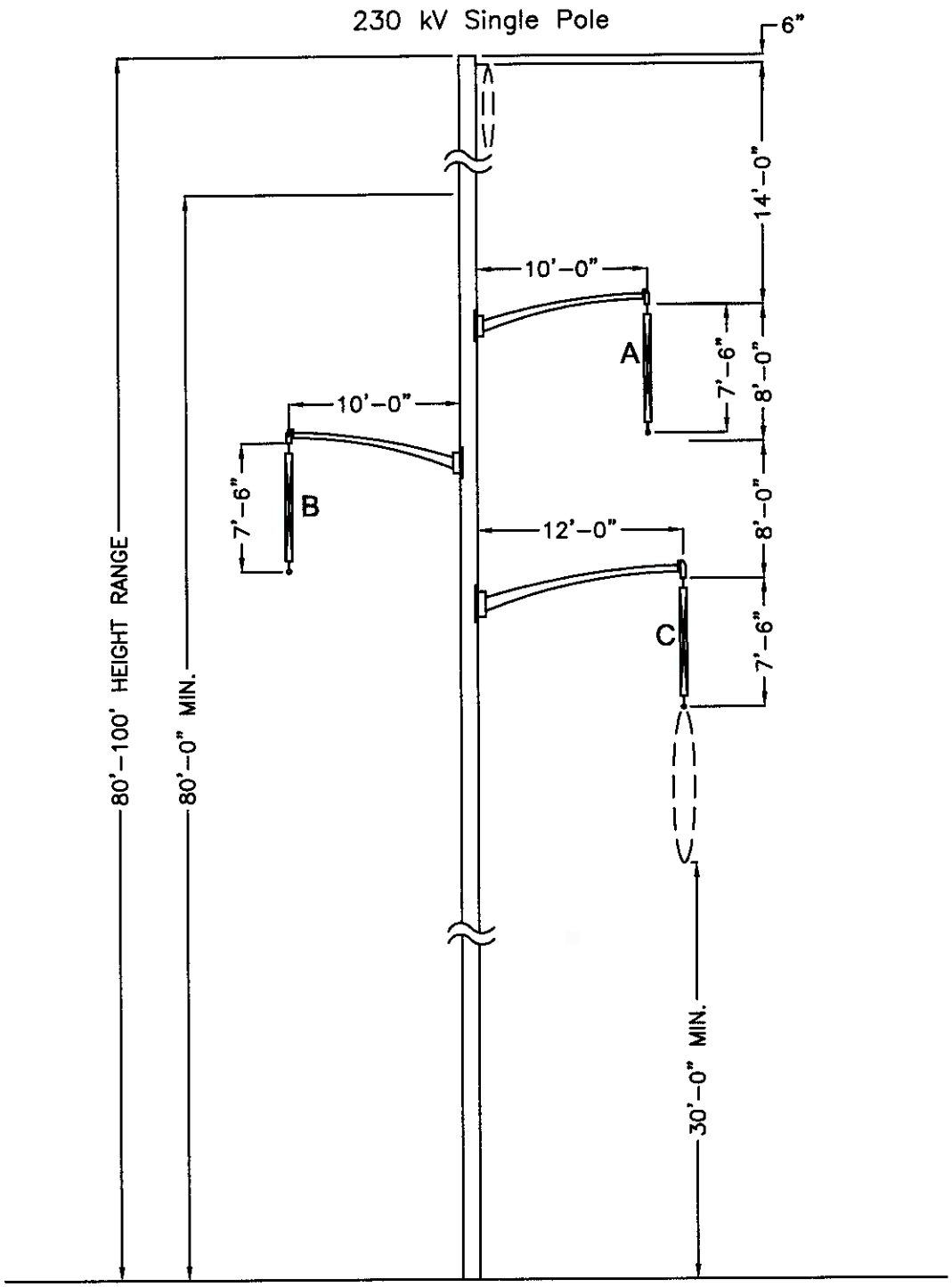
NOT TO SCALE

Noble

NOBLE FLAT HILL WIND PARK I
GLYNDON, CLAY COUNTY, MN

GRAPHIC 4–1
TYPICAL 230 kV H–FRAME

TETRA TECH EC, INC.



NOTE: WE ANTICIPATE THAT THE PROJECT WOULD USE 795 ACSR (ALUMINUM CONDUCTOR, STEEL REINFORCED, NON-BUNDLED), WITH A CAPACITY OF APPROXIMATELY 440 MVA (MEGA VOLT AMPERES).

NOT TO SCALE

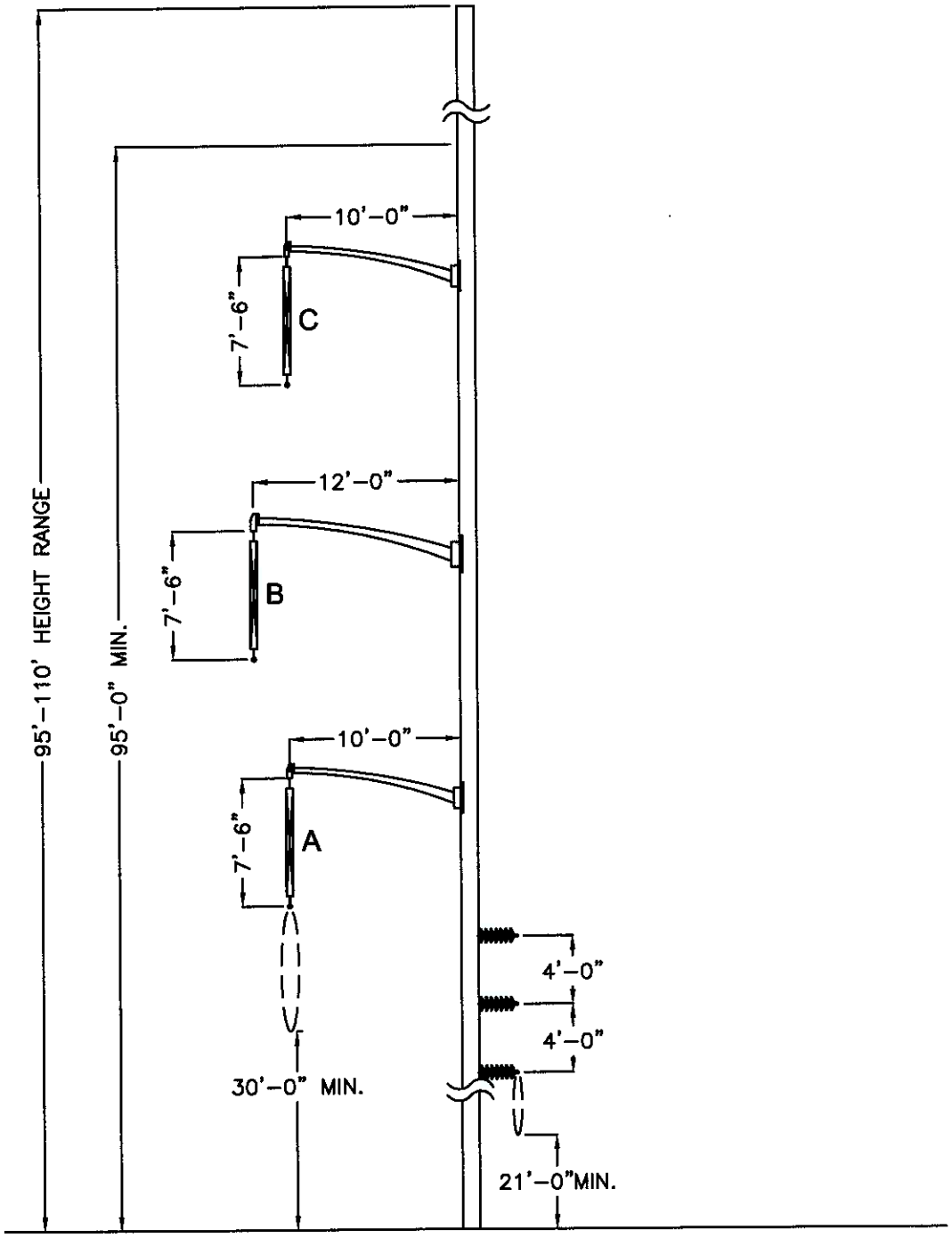
Noble

NOBLE FLAT HILL WIND PARK I
GLYNDON, CLAY COUNTY, MN

GRAPHIC 4-2
TYPICAL 230 kV SINGLE POLE STRUCTURE

TETRA TECH EC, INC.

230/23.5 kV Single Steel Pole Double Curcuit



NOTE: WE ANTICIPATE THAT THE PROJECT WOULD USE 795 ACSR (ALUMINUM CONDUCTOR, STEEL REINFORCED, NON–BUNDLED), WITH A CAPACITY OF APPROXIMATELY 440 MVA (MEGA VOLT AMPERES).

NOT TO SCALE

Noble

NOBLE FLAT HILL WIND PARK I
GLYNDON, CLAY COUNTY, MN

GRAPHIC 4–3
TYPICAL 230/23.5 kV SINGLE STEEL POLE DOUBLE CURCUIT

TETRA TECH EC, INC.