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JOINT APPLICATION FOR CERTIFICATE OF NEED

FOR THE BLACK OAK AND GETTY WIND PROJECTS

In Stearns County, Minnesota

DOCKET NO. IP6853 and IP6866/CN-11-471

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Application for Certificate of Need
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Stearns County, Minnesota

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Table 1: LEGF Certificate of Need Rule Cross-References

Minnesota Rule	Required Information	Applicability/ Location in the Document	Exemption Granted
7849.0120	Criteria – Probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to applicant, customers, people of MN and neighboring states	4.1	--
A 1	Accuracy of the applicant's forecast	6.0	Yes
A 2	Effects of the applicant's existing or expected conservation programs and state and federal conservation programs	8.0	No
A 3	Effects of promotional practices on energy demand	3.2.2	Yes
A 4	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	5.2.1.8	No
A 5	Effect of proposed facility in making efficient use of resources	4.2, 5.3.8	No
7849.0120	Criteria – A more reasonable and prudent alternative has not been demonstrated	4.2	--
B 1	Appropriate size, type and timing compared to reasonable alternatives	4.2, 5.2	No
B 2	Cost of the facility and its energy compared to reasonable alternatives	5.2.2, 5.3.1, 5.3.5, 5.3.6	No
B 3	Effects of the facility on natural and socioeconomic environments compared to the effects of reasonable alternative	4.3	No
B 4	Expected reliability compared to reasonable alternatives	4.2, 5.2, 5.3.3	No
7849.0120	Criteria - Project will provide benefits to society	3.2.1	--
C 1	Relationship of the proposed facility, or suitable modification to overall state energy needs	3.1, 4.1, 4.3	No
C 2	Effects of the facility on natural and socioeconomic environments compared to the effects of not building	4.3	No
C 3	Effects of the facility or suitable modification in inducing future development	4.3, 3.2.3	No

Minnesota Rule	Required Information	Applicability/ Location in the Document	Exemption Granted
C 4	Social beneficial uses of the output of the facility, or suitable modification including its uses to protect or enhance environmental quality	4.3, 3.2.1	No
D	Proposed facility or suitable modification will not fail to comply with relevant policies, rules and regulations of other state, federal, or local government agencies	4.4, 12.0	No
7849.0210	Filing Fees and Payment Schedule	2.3	No
7849.0240	Need Summary and Additional Considerations	3.0	--
Subpart 1	Need Summary – Summary of major factors justifying need for the facility	3.0, 3.1	No
Subpart 2 A	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	3.2.1, 4.3	No
B	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	3.2.2	Yes
C	Additional Considerations – Effects of facility in inducing future developments	3.2.3, 4.3	No
7849.0250	Description of Proposed LEGF and Alternatives	5.0	--
A 1	Description – Nominal generating capability and effects of economies of scale on the facility size and timing	5.1.1	No
A 2	Description – Anticipated operating cycle and annual capacity factor	5.1.2	No
A 3	Description – Type of fuel, reason for selection, projection of availability over life of the facility, and alternative fuels	5.1.3	No
A 4	Description – Anticipated heat rate of the facility	5.1.4	No
A 5	Description – Anticipated areas where facility will be located	5.1.5	No
B 1	Discussion of Alternatives – Purchased power	5.2.1.1	Yes
B 2	Discussion of Alternatives – Increased efficiency of existing facilities including transmission lines	5.2.1.2	Yes

Minnesota Rule	Required Information	Applicability/ Location in the Document	Exemption Granted
B 3	Discussion of Alternatives – New transmission lines	5.2.1.3	Yes
B 4	Discussion of Alternatives – New generating facilities of a different size and energy source	5.2.1	Yes
B 5	Discussion of Alternatives – Reasonable combinations of alternatives	5.2.1.11	No
C	Proposed Facility and Alternatives	5.3	Yes
C 1	Discuss – Capacity cost in current dollars/kilowatt	5.3.1	Yes
C 2	Discuss – Service life	5.3.2	Yes
C 3	Discuss – Estimated average annual availability	5.3.3	Yes
C 4	Discuss – Fuel costs in current dollars/kilowatt hour	5.3.4	Yes
C 5	Discuss – Viable operating and maintenance costs in current dollars/kilowatt hour	5.3.5	Yes
C 6	Discuss – Total cost in current dollars/kilowatt hour	5.3.6	Yes
C 7	Estimate – Effect on rates system wide and in MN	5.3.7	Yes
C 8	Efficiency – Expressed for a generating facility as the estimated heat rate	5.3.8	Yes
C 9	Major Assumptions – For providing information relating to Items 1-8, including projected escalation rates for fuel costs, operating and maintenance costs as well as projected capacity factors	5.3	Yes
D	Map Showing Applicant's System	5.4	Yes
E	Other Information – Relevant information about the proposed facility and alternatives necessary to determine need	--	--
7849.0270	Peak Demand and Electrical Consumption Forecast	6.0	Yes
Subpart 1	Scope – application shall contain pertinent data concerning peak demand and annual electrical consumption within the applicant's service area and system	6.0	Yes
Subpart 2	Content of Forecast	6.0	Yes

Minnesota Rule	Required Information	Applicability/ Location in the Document	Exemption Granted
Subpart 3	Forecast Methodology	6.0	Yes
Subpart 4	Data Base for Forecasts	6.0	Yes
Subpart 5	Assumptions and Special Information	6.0	Yes
Subpart 6	Coordination of Forecast with Other Systems	6.0	Yes
7849.0280	System Capacity	7.0	Yes
7849.0290	Conservation Programs	8.0	Yes
7849.0300	Consequences of Delay – Discuss anticipated consequences if proposed facility is delayed	9.0	Yes
7849.0310	Environmental Information – Provide environmental data in response to part 7849.0250, Item C or 7849.0260, Item C and information as requested in part 7849.320 to 7849.0340	10.0	No
7849.0320	Generating Facilities	11.0	No
A	The estimated range of land requirements, including water storage, cooling systems and solid waste storage	11.1	No
B	Estimated vehicular, rail and barge traffic generated by construction and operation of the LEGF	11.2	No
C	Fossil-Fueled Facilities – Fuel	11.3.1	No
D	Fossil-Fueled Facilities – Emissions	11.3.2	No
E	Water Use for Alternate Cooling Systems	11.4	No
F	Potential sources and types of discharges to water	11.5	No
G	Radioactive Releases	11.6	No
H	Potential types and quantities of solid wastes in tons/year	11.7	No
I	Potential sources and types of audible noise generated	11.8	No
J	Estimated work force required for construction and operation	11.9	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet	11.10	No

Minnesota Rule	Required Information	Applicability/ Location in the Document	Exemption Granted
7849.0330	Transmission Facilities	5.2.1.10	Yes
7849.0340	Alternative of No Facility	5.2.1.9	Yes

1.0 Executive Summary

Black Oak Wind, LLC ("Black Oak") and Getty Wind Company, LLC ("Getty") (collectively, the "Applicants") submit this application for a Certificate of Need ("CN") to the Minnesota Public Utilities Commission (the "Commission"), pursuant to and in accordance with *Minnesota Statutes*, Section 216B.243, and *Minnesota Rules*, Chapter 7849. The Applicants respectfully request that the Commission issue a CN for an up to 82 MW wind farm (the "Project"), a "large energy facility," as defined in *Minnesota Statutes*, Section 216B.2421, subd. 2(1) (2010), jointly owned by the Applicants.[1]

2.0 Introduction

2.1 The Black Oak Project

Black Oak Wind, LLC, a Minnesota limited liability company, is a wholly-owned subsidiary of Geronimo Wind Energy, LLC ("GWE"). GWE owns two operating wind farms in Minnesota and has a number of active development projects throughout the Midwest. Black Oak is proposing to build an up to 42 MW large wind energy conversion system near Sauk Centre in Ashley and Raymond Townships in Stearns County (the "Black Oak Project"). The Black Oak Project will consist of up to 28 wind energy generators and associated facilities, including gravel access roads, a step-up substation, a wind electrical collection system, an Operations and Maintenance ("O&M") building, permanent meteorological towers, and a Sonic Detection and Ranging ("SODAR") unit or Light Detection and Ranging ("LIDAR") unit. The project area encompasses approximately 7,000 acres.

GWE began developing the Black Oak Project in 2008 by holding a public open house, obtaining easements for site control and by filing an interconnection request with the Midwest Independent

[1] The project is also a Large Wind Energy Conversion System ("LWECS"), as defined in *Minnesota Statutes*, Section 216F.01, subd. 2 (2010).

Transmission System Operator (the "Midwest ISO"). Black Oak has continued to obtain site control, make progress through the Midwest ISO interconnection process, conduct environmental reviews of the project site and evaluate project economics. Black Oak filed a site permit application with the Commission in January 2011 in Docket No. IP6853/WS-10-1240. A draft site permit was issued in March 2011 and a public hearing was held in April 2011. The next procedural step in the siting docket is a final decision by the Commission.

2.2 The Getty Project

Getty Wind Company, LLC is a Minnesota limited liability company and a wholly-owned subsidiary of Getty Wind, LLC. Getty Wind, LLC was formed by 18 Minnesota residents for the purpose of developing an approximately 40 MW large wind energy conversion system in Stearns County (the "Getty Project"). The Getty Project currently plans to seek qualification as a Community-Based Energy Development ("C-BED") project pursuant to Minn. Stat. § 216B.1612. The Getty Project received a Resolution of Support from Stearns County Board of Commissioners on June 8, 2010.[2]

The Getty Project will consist of up to 27 turbines, a collection system, a substation, a transmission line, up to two permanent meteorological towers, an O&M facility, and associated roads. The Getty Project is located approximately six miles south of Sauk Centre in Getty, Grove, and Sauk Centre Townships in Stearns County. The Project footprint encompasses approximately 7,600 acres. Getty continues to obtain site control, progress through the Midwest ISO interconnection process, conduct environmental reviews of the project site and evaluate project economics. Getty plans to file a site permit application concurrent with this filing.

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[2] Stearns County Resolution Number 10-45.

2.3 Joint Application

The Applicants are submitting this joint application because they have executed an agreement whereby the two projects may come under common ownership at a future date. As discussed further in the Applicants' Reply Comments dated June 24, 2011, the Applicants believe that, with common ownership, the Project may fall within the definition of "large energy facility" under Minn. Stat. § 216B.2421, subd. 2(1)(2010) which could necessitate a CN for one or both sites.

Black Oak and Getty plan to co-develop the Project. In addition to the shared transmission facilities discussed in Section 5.0, the Applicants have also commissioned a number of joint studies, including those discussed in Sections 10.3 and 11.8, to assess the cumulative impacts of the Project.

Additionally, the Applicants plan to construct all 82 MWs prior to December 31, 2012. The Applicants have jointly marketed the 82 MW Project to potential purchasers and believe the economies of scale created by doing so are a more efficient use of resources than constructing the Black Oak and Getty projects separately.

2.4 Project Contacts

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2.5 Filing Fees and Payment Schedule (Minn. R. 7849.0210)

The total fee for the CN Application and the schedule for payment are shown in Table 2. The fee determination for the Project is based on a capacity of up to 82 MW, per the requirements of *Minnesota Rules*, Part 7849.0210, subp. 1. The payment schedule is based on *Minnesota Rules*, Part 7849.0210, subp. 2.

Table 2: Fee Calculation

Fee Calculation	Amount
Fee Calculation Equation	$10,000 + $50/MW
Due with CN Application	$3,525
Due 45 days after Application submittal date	$3,525
Due 90 days after Application submittal date	$3,525
Due 135 days after Application submittal date	$3,525
Total Calculated Fee	$14,100

2.6 Exemption Request

Minnesota Rules, Chapter 7849 sets forth the data an applicant must provide in a CN application. An applicant may be exempted from providing certain information if the applicant requests an exemption in a writing that shows that the data requirement is either unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document. *Minnesota Rules*, Part 7849.0200, subp. 6.

On May 24, 2011, the Applicants submitted a Request for Exemption from Certain Application Content Requirements (the "Exemption Request"). In the Exemption Request, the Applicants requested that the Commission grant them exemptions, pursuant to *Minnesota Rules*, Part 7849.0200, subp. 6, from certain CN data requirements that are not necessary to determine the need for an independent power production facility, or a renewable energy facility designed to satisfy a purchaser's renewable energy requirements. On August 11, 2011, the Commission granted the Applicants' Exemption Request. Where appropriate in this Application, the Applicants will reference the specific exemptions granted.

3.0 Need Summary and Additional Considerations (Minn. R. 7849.0240)

3.1 Need Summary

There are two primary factors justifying the need for this Project: (1) the continuing growth in demand for electricity in the state and region; and (2) the growing demand for additional renewable resources needed to meet the renewable energy requirement goals in Minnesota and neighboring states.

Increasing Demand for Energy. The Commission, the Minnesota Department of Commerce ("DOC"), and Minnesota utilities have all recognized that the demand for energy is growing. According to the 2008 Quad Report, there is "not enough excess generating capacity available to meet this increase in demand, new generation and transmission facilities will be needed in the near future to serve the electric needs and the reliability of the regional electricity transmission – both state and region."[3] The Minnesota Reliability Administrator's Minnesota Resource Assessment Study also concluded that electricity demand is likely to grow in the future and as much as 4,000 MW of renewable generation will be needed by 2025.[4] More recently, according to the Midwest Independent Transmission System Operator's ("MISO") 2010 Midwest Transmission Expansion Plan ("MTEP 2010"), when considering MISO's new and existing customers, MISO used a 1.1% growth rate for demand across its region and expected added demand in each study year.[5]

Minnesota and Other State Renewable Energy Standards. Through legislation, the Minnesota Legislature has encouraged the development of renewable energy, especially wind power. *Minnesota*

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[3] MN Office of Energy Security, 2008 Quad Report, at 7-8.
[4] Minnesota Office of Energy Security, "Minnesota Resource Assessment Study,' (October 2009), at 2- 3 (available at http://www.state.mn.us/mn/externalDocs/Commerce/Minnesota_Resource_Assessment_102109022827_MN_Resource_Assessment.pdf)
[5] MISO, MTEP 2010, at 75.

Statutes, Section 216B.1691 includes a renewable energy standard ("RES"), whereby utilities are required to provide twenty-five percent of their total retail electric sales from eligible resources by 2025.[6] The Legislature has also established interim milestones, shown on Table 3, to ensure utilities make measured progress toward the "25 by '25" requirement.[7]

Table 3: Renewable Energy Standard Milestones

Year	Non-nuclear Utility Requirement	Xcel Energy Requirement
2012	12%	18%
2016	17%	25%
2020	20%	30% (25% from wind)
2030	25%	30% (25% from wind)

On November 1, 2009, the Minnesota Transmission Owners jointly filed the 2009 Minnesota Biennial Transmission Projects Report (the "Biennial Report").[8] As required by *Minnesota Statutes*, Section 216B.2425, subd. 7, this report outlined the transmission upgrades needed to support development of renewable energy resources needed to meet upcoming RES requirements. Chapter 8 of the Biennial Report includes a discussion of the renewable energy capacity Minnesota utilities have acquired to fulfill their near-term RES requirements, as well as the additional renewable energy they will need to acquire to meet future RES milestones. As shown on the following Chart 1 and Table 4, Minnesota utilities need to acquire over 500 additional MWs to meet the 2016 RES milestone and up to 3,332 additional MWs to meet the 2025 RES milestone.[9]

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[6] *Minnesota Statutes*, Section 216B.1691, subd. 2a (2010).
[7] *Id.*
[8] *2009 Minnesota Biennial Transmission Project Report* Docket No. E999/M-09-602 available at www.edockets.state.mn.us (November 1, 2009). The next biennial report is due to be filed in November 2011.
[9] Chart 1 and Table 4 can be found on pages 317 and 318, respectively, of the Biennial Report.

Chart 1: RES Capacity Acquired and Net RES/REO Need

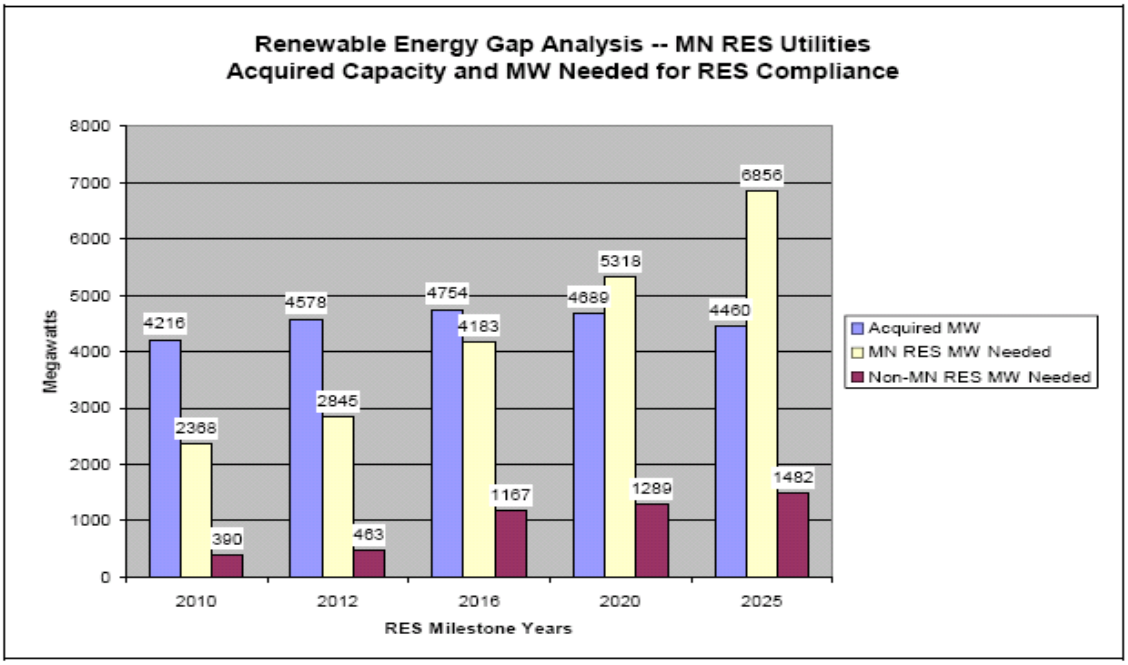

Table 4: RES Capacity & Net MN RES Capacity Need

Table 2. RES Capacity Acquired & Net MN RES Capacity Need* (MW)

Utility	2010		2012		2016		2020		2025	
	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net
Basin**	327.8	0	479.3	0	627.8	0	627.8	0	620.5	0
CMMPA	19.72	0	19.72	0	24.02	0	44.02	0	46.42	0
Dairyland	87.7	0	153.3	0	262.1	0	322.1	0	382.1	0
GRE	216	0	316	0	310	278	299	446	295	745
Heartland	36	0	36	0	36	0	36	0	36	0
IPL	23	0	23	0	22	0	20	0	18	0
Minnkota	359	0	359	0	359	0	359	0	359	0
MN Power	409	0	448	0	420	6	420	111	420	263
MRES	82.4	0	82.4	0	82.4	0	82.4	9.7	82.4	45.1
SMMPA	124.3	0	125.9	0	125.9	54.6	125.9	103.1	125.9	182.1
Otter Tail	190.2	0	190.2	0	190.2	0	190.2	0	190.2	0
RPU	7.5	0	12.5	0	12.5	0	12.5	0	12.5	1.87
Xcel	2,333	0	2,333	620	2,282	194	2,150	1,036	1,872	2,095
Total	4,216	0	4,578	620	4,754	533	4,689	1,746	4,460	3,332

* Capacity factor assumptions established by each utility.
** Basin Electric numbers include East River Electric and L&O
*** Some utilities with less than sufficient capacity to meet the MN RES need may use renewable energy credits to fulfill their requirement.

According to MTEP 2010, the eleven states in the MISO region are expected to need approximately 25,000 MW of wind to meet existing renewable energy standards and objectives, yet have only achieved about 8,200 MW to date.[10] As discussed in this section, Minnesota and other MISO utilities must develop or purchase a significant amount of additional renewable generation in order to satisfy state renewable energy policies. A growing number of utilities are seeking to purchase wind energy to replace retiring or potentially retiring facilities. Wind energy is being selected because it is relatively immune to federal regulatory risks and provides a competitive price per megawatt hour generated when compared with other low risk energy resources. These market risks and benefits have resulted in utilities procuring wind energy despite having no renewable requirements. Additionally, the Applicants have seen a rise in wind energy procurement by large consumers as a 20 year hedge on the increase in future power prices, Google being the most notable of these customers, but not the only one. In nonpublic solicitations, the Applicants have received requests for similar services from other electricity consumers under similar structures as Google. Given this demand for renewable energy, a market exists for independently produced electricity generated from wind and other renewables, including the up to 82 MW of wind energy generated by the Project.

The Applicants recognize that a number of other independent power producers ("IPP") have also recently applied for CNs to meet this same need.[11] Despite these applications, additional wind resources are still needed because it is unlikely there will be a perfect match between CN applications and demonstrated renewable needs. For example, some of the need for Minnesota's RES will be met by out-of-state renewables and some Minnesota facilities will sell to out-of-state utilities. As an IPP, the Applicants believe that obtaining permits, in addition to securing

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[10] MTEP 2010, at 252.
[11] PUC Staff noted in the Briefing Papers in Docket No. IP6838/CN-10-80 that approximately 1,550 MW of IPP wind project have applied for CNs since 2008 (Staff Briefing Papers, at 17).

transmission and financing, is essential to putting together successful competitive bid proposals. Securing its state permits is an important part of putting together successful bid applications.

3.2 Additional Considerations

3.2.1 Socially Beneficial Uses of Energy Output

Energy produced by the Project will provide a number of significant societal benefits. First, the Project is fueled by wind, which is a renewable resource that produces no air emissions and uses no water. The fuel supply is infinite, making wind energy preferable over conventional fossil fuels. Second, this project increases the geographic dispersion of wind in Minnesota by locating 82 MWs in the Central part of the state, rather than the southwestern or southeastern parts. Geographically dispersed wind generation is less variable in the aggregate, and therefore easier to manage, than the same amount of wind concentrated in a single region.[12] Third, the Project will also provide a supplementary source of income for the rural landowners and farmers on whose land the Project will be sited. The landowners in the Project footprint who host turbines will receive annual lease payments for each turbine sited on their property. Large-scale wind energy operations usually pay greater than $5,000 per turbine each year to lease wind rights from farmers that own the land on which the turbines are sited.

Finally, because only a portion of the land is used for turbine siting, access roads, and O&M facilities, farming operations can continue largely undisturbed. While the Project will be sited over an area spanning approximately 14,600 acres of land, only approximately 29 to 50 total acres will be permanently removed from agricultural use over the life of the Project.

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[12] EnerNex Corporation, "Final Report – 2006 Minnesota Wind Integration Study, Vol. 1 at 13 (Nov. 30, 2006).

3.2.2 Promotional Activities Giving Rise to Demand

The Commission granted Applicants' request for an exemption from *Minnesota Rules*, Part 7849.0240, subpart 2(B), which requires that each large electric generating facility ("LEGF") CN application contain "an explanation of the relationship of the proposed facility to . . . promotional activities that may have given rise to the demand for the facility." The Applicants have not engaged in promotional activities which could have given rise to the need for the electricity to be generated by the proposed Project, and, thus, such information is non-existent.

3.2.3 Effects of Facility in Inducing Future Development

The Project is not expected to directly affect development in Stearns County. This is not to say however, that additional wind energy infrastructure in the Project area will not provide significant benefits to the local economy and local landowners. Landowners in the project area will benefit from annual lease payments. Additional wind energy infrastructure will also provide an additional source of revenue in the counties and townships in which the Project is sited. For instance, the combined Project is projected to provide annual production tax revenues ranging from approximately $336,173 to $387,900.

The Project will also provide significant income opportunities for local residents not affiliated with project ownership. Together, the Black Oak and Getty projects are expected to generate 90 to 135 construction jobs and 4 to 6 permanent operations and maintenance positions. The Project has already created consulting, management, and environmental work.

4.0 Compliance with Certificate of Need Criteria (Minn. R. 7849.120)

The Commission has established criteria to assess the need for a large electric generating facility in *Minnesota Rules*, Part 7849.0120. The Commission must grant a CN to an applicant upon determining that:

> A. [T]he probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states (Part 7849.0120(A));
>
> B. [A] more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record (Part 7849.0120(B));
>
> C. [B]y a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health (Part 7849.0120(C)); and
>
> D. [T]he record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments (Part 7849.0120(D)).

As discussed further below, the Project satisfies all four of the Commission's criteria for granting a certificate of need for the Project.

4.1 The Probable Result of Denial of the Applicants' Application Would Be an Adverse Effect on the Adequacy, Reliability, and Efficiency of the Regional Energy Supply (Minn. R. 7849.0120(A))

The Project will provide up to 82 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. The Applicants plan to negotiate one or more PPAs with utilities with a need to purchase additional renewable energy or, if necessary, to offer the Project's output for sale on

the wholesale market. Denying this application would result in the loss of a significant amount of electricity needed to satisfy state and regional demand, and would deny utilities the opportunity to purchase clean, low-cost energy that will count toward satisfying state renewable energy obligations.

As discussed in Section 3.1, a growing need exists for additional electric energy throughout this region. In addition, there is a growing body of state legislative policy requiring utilities to obtain a certain percentage of their total energy resources from renewable energy. In addition to the specific need for renewable energy to serve Minnesota utilities, many other states in the region have similar renewable energy requirements. For example, Wisconsin has an overall state goal of obtaining 10 percent of their resources from renewables by 2015, with specific interim requirements for utilities; North Dakota and South Dakota each have established goals to obtain 10 percent of all retail sales in those states from renewables by 2015; and Illinois requires certain utilities to obtain 25 percent of eligible sales from renewables by 2025.[13] Based on this data, there is a need for more wind power to adequately, reliably and efficiently meet the region's need for renewable energy than is currently available.

The project increases the reliability of the region's energy supply by increasing the geographic dispersion of wind resources. As discussed in Section 3.2.1, when wind resources are spread throughout a geographic region, rather than concentrate in one area, the wind becomes more reliable on a system wide basis.

The Project also increases the efficiency of the existing system by using existing transmission infrastructure to site this 82 MW project. The Midwest ISO and the relevant Transmission Owners have completed the facility study of the project and have identified minor upgrades needed. Additional renewable resources, like the wind energy produced by the Project are needed to

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[13] Database of State Incentives for Renewables & Efficiency, *Summary Map of State Renewable Portfolio Standards*, available at: http://www.dsireusa.org (accessed July 18, 2011).

adequately meet this regional need; the project, in particular, will be able to meet near term demands because of its interconnection status.

4.2 No More Reasonable and Prudent Alternative to the Project has been Demonstrated (Minn. R. 7849.0120(B))

Minnesota Rules, Part 7849.0120(B) requires an applicant for a CN to examine possible project alternatives so that the Commission can determine whether a more reasonable and prudent alternative exists. Applying the factors set forth in Minnesota *Rule*, Part 7849.0120(B), the Project has many advantages when compared to other renewable alternatives.

Size, Type, Timing. In evaluating alternatives, the Commission examines whether the project is the appropriate size, whether it is the right type, and whether the timing is appropriate. With respect to other proposed wind projects, the Commission has concluded that the proper inquiry in evaluating the size of the project is the appropriateness of the size of the project to the overall state and regional need for renewable energy. As demonstrated in Section 3.1, the need for renewable energy in the coming years far exceeds the amount of energy to be supplied by this Project. As shown on Table 4, Minnesota utilities have a need for renewable energy beyond what is currently under contract in order to meet future RES milestones. Further data in MTEP 2010 shows a regional need for additional renewable energy.

Regarding the type of facility, the Applicants have requested an exemption from *Minnesota Rules*, Part 7849.0250(B) with respect to evaluating fossil fuel alternatives, since such alternatives do not meet the Project's objective of providing energy that will satisfy utilities' renewable energy requirements. Because the Legislature envisioned that most of Minnesota's renewable energy would come from wind, and wind is currently the least-cost renewable option for commercial-sized electric generation in Minnesota, the Project is exactly the type of facility that Minnesota utilities need to satisfy their RES milestones. In addition, constructing this project by fourth quarter 2012 allows the

Project to be eligible for the federal production tax credit ("PTC"). The PTC is a substantial federal tax incentive that significantly reduces the cost of renewable energy for consumers.

With respect to timing, the Project is expected to be on-line and operational by the last quarter of 2012, depending on completion of regulatory approvals and the MISO interconnection process. This will help Minnesota electric utilities achieve the necessary renewable energy levels required to meet the pending 2016 milestones.

Cost Analysis. The Project will generate electricity at a lower cost per kilowatt than would other possible renewable options, such as solar or biomass. (See discussion in Section 5.2.2) In addition, while the Applicants have yet to secure PPAs for sale of the energy produced by the Project, the Applicants are confident that they will be able to secure long-term sale arrangements at attractive costs and terms. Importantly, as independent power producers, the risk of not securing PPAs, or otherwise selling the Project's output, lies entirely with the Applicants, and not with the State of Minnesota or ratepayers.

Potential Environmental and Socioeconomic Impacts. The purpose of this analysis is to compare the potential impacts of various renewable generation options. The Commission and the Department have previously concluded that the environmental impacts of a wind power project are minimal and significantly less than a fossil-fuel based facility. At the same time, the socioeconomic benefits of a utility-scale wind power project are considerable, as described further in Section 4.3 below. For example, the Project will allow landowners to continue to use over 99 percent of the existing cropland for agricultural or other uses, while also enjoying an additional revenue stream from the wind project.

Reliability. The Project will be available at least 95% of the time, consistent with other recent utility-scale wind projects.

4.3 The Project Will Benefit Society in a Manner Compatible with the Natural and Socioeconomic Environments (Minn. R. 7849.0120(C))

Minnesota Rules, Part 7849.0120(C) requires an applicant for a CN to address whether the proposed project will benefit society in a manner that is compatible with protecting natural and socioeconomic environments, including human health. Applying the factors set forth in *Minnesota Rules*, Part 7849.0120(C), the energy produced by the Project will provide significant, numerous, and varied societal benefits, with minimal negative impacts.

Overall State Energy Needs. As discussed in Section 3.1 above, Minnesota and other regional utilities need a significant amount of renewable energy to satisfy their renewable energy requirements, as well as to meet consumers' increasing energy demands. Thus, the Project is compatible with Minnesota's and the region's growing renewable energy needs.

Potential Environmental and Socioeconomic Impacts Compared to No-Build Alternative. Negative impacts to socioeconomic resources will be relatively minor. Only between approximately 29 and 50 acres of agricultural land will be permanently removed from production, and the areas surrounding each turbine may still be farmed. Project construction will not negatively impact leading industries within the Project area. There is no indication that any minority or low-income population is concentrated in any one area of the Project, or that the wind turbines will be placed in an area occupied primarily by any minority group.

One of the greatest attributes of wind energy is its minimal impact on the environment. The Project will not release 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 permanently impact less than one-half of one percent of the total acreage within the Project's boundaries, and will be sited so as to

minimize the impact on the environment. The Applicants have also taken a number of steps to minimize impacts to wildlife (see Section 10.3) and expect impacts to wildlife from the Project will be similar to those of other Minnesota wind farms.

The development of wind energy has been and will continue to be important in diversifying and strengthening the economic base of Stearns County and Minnesota. Local contractors and suppliers will be used for portions of the construction. Wages and salaries paid to contractors and workers in Stearns County will contribute to the total personal income of the region. At least part of the wages paid to temporary and permanent Project workers will remain circulating within the county and the state. Expenditures made by the Applicants for equipment, fuel, operating supplies, and other products and services will benefit businesses in the county and the state. Landowners with turbines or other Project facilities on their land will receive annual lease payments for the life of the Project, and these payments will diversify and strengthen the local economy.

Long-term benefits to the county's tax base as a result of the construction and operation of the Project will contribute to improving the local economy. For instance, the Project will pay a Wind Energy Production Tax to the local units of government of $0.0012 per kWh of electricity produced, resulting in an annual Wind Energy Production Tax ranging from approximately $336,173 to $387,900.

Not building an electrical generation facility would result in no physical impact to the environment in Stearns County. On the other hand, not building such a facility would also not provide an additional source of tax revenues to the counties, an increase in the income stream to the residents and businesses in the counties, or an increase in the amount of low-cost, clean, reliable renewable energy available to state or regional utilities and their customers. The Project will have minimal impact on the physical environment, while simultaneously providing significant benefits to society.

Inducing Future Development. Although the Project is not expected to directly affect development in Stearns County, the Project will provide significant benefits to the local economy and local landowners. Landowners in the project area will benefit from annual lease payments, and installation of wind energy infrastructure will increase the local tax base in the county and townships in which the Project is sited. The Project will also provide significant income opportunities for local residents through the creation of temporary construction and permanent operations and maintenance positions.

Socially Beneficial Uses of Output. The Project will provide Minnesota and the region with affordable, clean, renewable energy that will help meet energy demands and the renewable energy requirements. In addition, the local economy will benefit from the landowner lease payments for turbine siting, production taxes, income from jobs created, and local spending. See Section 3.2.1 for further discussion.

4.4 The Project is Consistent with Federal, State, and Local Rules and Policies (Minn. R. 7849.0120(D))

4.4.1 The Project is Consistent with Minnesota Energy Policy

The Project will provide a significant amount of renewable energy, which is consistent with Minnesota's policy to increase renewable energy use. Wind, as a renewable energy, is a favored energy resource under the CN Statute.[14] Also, as discussed above, the RES includes the "25 by '25" requirement, which mandates increased electric generation from renewable resources.[15] In addition, the state has set a goal to reduce statewide greenhouse gas emissions across all sectors producing

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[14] *See Minnesota Statutes*, Section 216B.243, subd. 3a (2010) ("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.") (Emphasis added.)

[15] *Minnesota Statutes*, Section 216B.1691, subd. 2a (2010).

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.[16] Adding additional sources of electric energy with no emissions, like wind energy, is essential to meeting these greenhouse gas emission goals.

Further support for the conclusion that the Project is consistent with state energy policy can be found in the favorable tax treatment that wind energy facilities receive. The state legislature has exempted all real and personal property of wind energy conversion systems from property taxes.[17] 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.[18]

4.4.2 The Project is Consistent with Applicable Minnesota Statutory Provisions

In addition to the criteria set forth in *Minnesota Rule*, Part 7849, there are a number of statutory provisions that may apply to CN applications. As discussed below, the Project is consistent with these statutory requirements.

4.4.2.1 Renewable Preference

Minnesota Statutes, Section 216B.243, subd. 3a, provides a preference for renewable resources. It states:

> 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 commissions 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.

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[16] *Minnesota Statutes*, Section 216H.02 (2010).
[17] *Minnesota Statutes*, Section 272.02, subd. 22 (2010).
[18] *Minnesota Statutes*, Section 297A.68, subd. 12 (2010).

Minnesota Statutes, Section 216B.2422, subd. 4, is also applicable. That statute states:

> 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 Project is consistent with Minnesota's preference for renewable wind energy and satisfies these statutory criteria by providing additional available resources to meet this renewable energy preference.

4.4.2.2 Distributed Generation

Minnesota Statutes, Section 216B.2426 states that:

> The commission shall ensure that opportunities for the installation of distributed generation, as that term is defined in section 216B.169, subdivision 1, paragraph (c), are considered in any proceeding under section 216B.2422, 216B.2425, or 216B.243.

Pursuant to Section 216B.169, subd. 1(c), "distributed generation" references projects of less than 10 megawatts. The Applicants assume that the Project will need to compete with distributed generation alternatives as it seeks a power purchase agreement from a utility. However, the Project's transmission opportunities and economies of scale make it a superior renewable resource choice as compared to distributed generation projects that have available transmission but not the economies of scale that should be realized through this Project.

4.4.2.3 Innovative Energy Project Preference

Minnesota also requires the Commission to consider an innovative energy project before authorizing construction or expansion of a fossil-fuel generation facility.[19] Because the Project is not a fossil-fuel facility, this requirement is not applicable.

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[19] *Minnesota Statutes*, Section 216B.1694, subd. 2(a)(5). Pursuant to *Minnesota Statutes*, Section 216B.1694, subd. 1, an "innovative energy project" is defined as a coal-burning facility employing innovative technology and located on the Iron Range.

4.4.2.4 RES Compliance

Minnesota Statutes, Section 216B.243, subd. 3(10) requires the Commission to evaluate whether an applicant for a CN is in compliance with Minnesota's RES. The Applicants are not subject to the RES because the Applicants have no retail sales of electricity in Minnesota. Therefore, this requirement does not apply to the Project. The Project will, however, serve as a resource for utilities that must meet the RES requirements.

4.4.2.5 Community-Based Development (C-BED) Projects

Minnesota Statutes, Section 216B.1612(c) requires the Commission in a CN proceeding to consider a utility's efforts to purchase energy from community-based energy projects.[20] Because the Applicants are independent power producers that do not serve retail customers, this statute does not apply.

4.4.2.6 Environmental Cost Planning

Minnesota Statutes, Section 216B.243, subd. 3(12) requires the Commission to evaluate the extent to which an applicant has considered the risk of environmental costs and regulation. As the Commission and the DOC have previously determined, this statute does not apply to renewable generation facilities such as the Project.[21]

4.4.2.7 Transmission Planning Compliance

Minnesota Statutes, Section 216B.243, subd. 3(10) requires the Commission to consider whether a utility seeking a CN is in compliance with certain transmission planning requirements to meet the RES. Again, as independent power producers, this statute does not apply to the Applicants.

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[20] The term "community-based energy project" is defined in *Minnesota Statutes*, Section 216B.1612.
[21] *Elm Creek*, Docket No. IP6631/CN-07-789, MPUC Order Granting Certificate of Need, January 15, 2008, p. 12.

4.4.3 The Project is Consistent with Federal Energy Policy

4.4.3.1 Tax Incentives

Federal energy policy provides significant U.S. federal tax incentives to attract investment in renewable energy projects, including wind projects such as the Project.

The Production Tax Credit ("PTC") provided by Section 45 of the Internal Revenue Code provides for a federal income tax credit for each qualified kilowatt hour sold by a project during the tax year for the first ten years of the life of the project. The PTC is $0.022 per kilowatt hour in 2010, and it escalates with inflation. The American Recovery & Reinvestment Act of 2009 ("ARRA") extended the PTC for wind and other eligible facilities placed in service through December 31, 2012.

The Internal Revenue Service ("IRS"), under the Modified Accelerated Cost Recovery System ("MACRS"), has also allowed businesses to recover investments in solar, wind, and geothermal property through depreciation deductions.22 For solar, wind, and geothermal property placed in service after 1986, the current MACRS property class is five years. A substantial portion of the Project's components will qualify for accelerated tax depreciation treatment based on the MACRS five year schedule.

4.4.3.2 National Support for a "25 by '25" Initiative

The "25 by '25" initiative has found support outside of Minnesota. The Governor's Wind Energy Coalition, a bipartisan group of 27 governors, recommended adopting a national renewable energy standard.[23] In addition, the U.S. Congress is currently considering legislation which would create a national Renewable Energy Standard requiring certain utilities throughout the country to obtain a

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[22] *See* 26 U.S.C. § 168 (2010).
[23] "Great Expectations: U.S. Wind Energy Development," March 2010, available at www.governorswindenergycoalition.org (accessed July 19, 2011).

percentage of their energy resources from eligible renewable sources.[24] Such legislation could significantly increase the demand for renewable energy produced by projects such as this one.

4.4.3.3 The Project Complies with Federal, State, and Local Environmental Regulations

The Project will meet or exceed the requirements of all applicable federal, state, and local environmental laws and regulations. Table 8 in Section 12.4 provides a list of approvals the Project may need to obtain from governmental entities to demonstrate full compliance. The Applicants are committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

[24] *See, e.g.,* S. 559 (Hobuchar) and S.741 (Udall).

5.0 Description of Project and Alternatives (Minn. R. 7849.0250)

5.1 Proposed Project (Minn. R. 7849.0250(A))

The Project will consist of an array of wind turbines, transformers, a project substation, access roads, permanent meteorological towers, a SODAR or LIDAR unit, and an O&M building. The turbines will be interconnected by communication and electric power collection cable within the wind farm. In addition, the wind farm facilities will include electrical collection lines, junction boxes, and a 69 kV transmission line that will deliver the electricity to the grid. Provided with this Application are Figure 1 (Project Location Map) and Figure 2 (Proposed Turbine Layout Map (1.8 MW)).[25]

Each wind turbine will be accessible via all-weather gravel roads that are approximately 16 feet in width, depending on the turbine size selected, and will extend from public roads to the turbines. The Applicants estimate that approximately 6.6 to 11.6 miles of gravel access roads will be constructed, depending on the size of the turbine selected and the final design. Land will be graded on-site for the turbine pads. Drainage systems, access roads, storage areas, and O&M facilities will be installed as necessary to fully accommodate all aspects of the construction, operation, and maintenance of the Project.

With respect to turbines, the Applicants are proposing to use wind turbines in the 1.5 MW to 3.0 MW size range. If the Applicants select a 1.5 MW turbine, up to 52 turbines would be used, while the selection of a 1.8 MW or 3.0 MW turbine would result in the use of up to 44 or 27 turbines, respectively. Once additional site-specific data is obtained, the Applicants will make a final turbine selection based on optimization of wind and land resources and cost efficiency. The turbine selected

[25] Figure 2 shows the preliminary turbine locations for an 82 MW layout of 1.8 MW turbines. The Applicants will update the site layout prior to construction to reflect final micrositing of the turbine ultimately selected.

will have Supervisory Control and Data Acquisitions ("SCADA") communication technology, which permits automatic, independent operation, and remote supervision that allows simultaneous control of the wind turbines. In addition, the Applicants will maintain a computer program and database to track each wind turbine's operational history.

Each tower will be secured by a concrete foundation that can vary in design depending on the soil conditions. A control panel inside the base of each turbine tower houses communication and electronic circuitry. Each turbine is equipped with a wind speed and direction sensor that communicates to the turbine's control system to signal when sufficient winds are present for operation. The turbines feature variable-speed control and independent blade pitch to assure aerodynamic efficiency.

Each turbine will use a step-up transformer to raise the voltage to power collection line voltage of 34.5 kV. The transformer may be installed at the base of each turbine or installed inside each turbine. Generally, the electrical lines will be buried in trenches and run from turbine to turbine or to the edge of the farm field. At the public road, the power collection lines will either rise from underground to overhead lines or continue as underground lines. The collection lines will occasionally require an aboveground junction box when the collection lines from separate spools need to be spliced together.

Black Oak and Getty filed separate interconnection requests with the Midwest ISO for interconnection at Xcel Energy's Black Oak switching station. The Black Oak switching station is located approximately three and one-half miles east of the Getty Project's footprint. The Getty Project plans to build a 69 kV transmission line from the Getty Project substation to an existing station bay in the Black Oak switching station. *See* Figure 4. Getty has acquired all easements required to construct and operate the transmission line on private land.

Because of their close geographic proximity and the similar point of interconnection, Getty and Black Oak plan to share the capacity of the new 69 kV transmission line. This arrangement will

reduce costs for each project and reduce the impact on area landowners by eliminating the need to site and route a redundant 69 kV line and step up substation to service the Black Oak Project. This scenario may also eliminate the need to expand the Black Oak switching station by allowing both projects to use the same existing station bay.

The Applicants' interconnection requests were studied as part of Midwest ISO Definitive Planning Phase ("DPP") Cycle 1. Both projects have completed their Midwest ISO Facilities Studies and are prepared to move to Generator Interconnection Agreement negotiations upon the completion of the Midwest ISO Group 5 and DPP Cycle 1 Restudies and any other necessary restudies. Because of their interconnection location and similar size, the projects share identical transmission system upgrades. As currently contemplated, the Petitioners will complete the transmission process and interconnect the projects to the Midwest ISO system at or near the same time.

5.1.1 Nominal Generating Capability and Effect of Economies of Scale

Each wind turbine will have a net nominal rating of between 1.5 and 3.0 MW for a total generation capacity of up to 82 MW. As discussed in Section 2.0, the economies of scale involved in sharing transmission facilities, construction and O&M costs prompted Black Oak and Getty to jointly propose this 82 MW project, rather than two approximately 40 MW projects. The project have chosen to come together at this time to take advantage of the federal PTC before it expires. The Applicants believe that their decision to build an 82 MW project in 2012 will benefit ratepayers by making very competitive wind energy available to meet state renewable energy requirements.

5.1.2 Annual Capacity Factor

A net capacity factor of approximately 39 to 45 percent, with projected average annual output of between approximately 280,145 and 323,244 MWh, is anticipated for the Project.

5.1.3 Fuel

The wind turbines will be powered by the wind.[26]

5.1.4 Anticipated Heat Rate

Heat rates are not applicable to a wind project.

5.1.5 Facility Location

The Project is located within Ashley, Getty, Grove, Raymond and Sauk Centre Townships in Stearns County, about six miles south of Sauk Centre, Minnesota. The Project's boundary includes 14,100 acres, and the Applicants currently have site control over approximately 11,200 of these acres. The area of direct land use will be between approximately 29 and 50 acres for the turbines and gravel access roads, depending on the turbine size selected, plus one additional acre for the construction of a project substation. The Applicants currently anticipate using an existing industrial location near the project for the O&M building.

The Project area is rural with an agricultural-based economy. The Project site was selected based on its excellent wind resources, its close proximity to existing transmission infrastructure and substations, and the landowners' interest in participating in the Project.

5.2 Availability of 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. As noted above, the Applicants intend to develop a generation source that will aid utilities in satisfying the renewable energy need created by the Minnesota RES and other state renewable standards. Therefore, non-renewable energy sources have

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[26] *Minnesota Rules*, Part 7849.0250(A)(3) also requests information projecting the availability of the proposed Project's fuel source and alternative fuels. The Commission has determined that these data requirements are inapplicable to a wind facility. *See e.g., In the Matter of the Application of High Prairie Wind Farm II, LLC for a Certificate of Need for a Large Energy Facility*, Docket No. PT-6556/CN-06-1428, Order, dated Dec. 11, 2006.

been excluded from this alternatives analysis.[27] 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 independent power producers, like Black Oak and Getty. The Applicants do not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, as a seller of electricity to utilities, the Applicants must keep their prices – and, thus, their costs – low enough to remain competitive. For these reasons, the Applicants must exercise diligence in deciding where and when to pursue opportunities for capital investment in new power generating facilities.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated. Without a guaranty of long-term reliability and cost-effectiveness, it is difficult or impossible to convince customers that an unproven technology should be selected for purchase.

5.2.1 Alternatives Considered

5.2.1.1 Purchased Power Alternative

The Applicants are independent power producers and do not purchase power. Instead, the Applicants will sell power to utilities. As such, this data requirement is not applicable and the Commission has granted an exemption to this data requirement.

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[27] *Minnesota Rules*, Part 7849.0250(B)(4) requires an applicant to discuss the availability of new generating facilities of a different size or using a different energy source as an alternative to the proposed facility. The Applicants received a partial exemption from this data requirement and instead will discuss as alternatives only renewable energy sources that would satisfy renewable energy requirements.

5.2.1.2 Alternative of Performing Upgrades to Existing Resources

The Applicants have no existing facilities in Minnesota for which they might seek improved operating efficiency. As such, this data requirement is not applicable and the Commission granted the Applicants an exemption.

5.2.1.3 New Transmission Alternative

The Applicants plan to utilize a new privately held three and one half-mile 69 kV transmission line to interconnect the Project's energy output to the electric grid. However, development, construction and operation of all other transmission lines will be left to utilities with defined service area obligations to retail customers. As such, this data requirement is not applicable and the Commission granted the Applicant's requested exemption.

5.2.1.4 Solar Power

While Minnesota has a significant solar resource, to date, the cost of reliable solar equipment has prevented its widespread application. According to the EIA, solar power is currently a "niche" source of renewable energy because it is only economical where electricity prices are especially high, peak load pricing occurs or where government incentives are available. Despite a record year for solar PV installations in 2010, Minnesota has just over 3 MW of solar photovoltaics installed.[28] Currently, the largest solar powered electric system in the Upper Midwest is an approximately 600 kW system installed on the Minneapolis Convention Center. To date, solar installations provide significantly less output than the 82 MW proposed wind project.[29]

Solar thermal technology continues to develop. There are typically two types of solar thermal plants: towers and parabolic troughs. Solar towers are still in the early stages of technology development. The more common parabolic troughs require large fields of reflectors concentrated on

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[28] Minnesota Department of Commerce, "Minnesota Utility Solar Integration Rankings" (April 2011).
[29] www.minneapolisconventioncenter.com/about/sustainability.com (accessed July 20, 2011).

a central location. This technology is also still much more expensive than wind, as shown in Table 5 below. Thus, solar power is not an alternative to the Project.

5.2.1.5 Hydropower

Hydropower is also not an alternative to the Project. As of 2008, Minnesota had 195 MW of hydroelectric generation, with the largest system generating 75 MW.[30] 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.[31] Thus, a single site 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 Project.

5.2.1.6 Biomass

Biomass includes a number of different derivatives of plant and animal products and byproducts. These may include trees, vegetation, agricultural products, manure and wastewater. The environmental impacts of biomass combustion or decay facilities may be greater than the proposed Project, due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel.[32] In addition, biomass electric generation facilities in Minnesota generally have outputs that are much smaller than the proposed Project.[33] For these reasons, a biomass plant is not an alternative to the Project.

5.2.1.7 Alternative of Emerging Technologies

Few renewable emerging power generation technologies have been developed, and the Applicants believe that the current approaches are not sufficiently mature to either provide the output needed or to be cost-effective. As noted in the Minnesota Resource Assessment Study, "While new

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[30] MN DOC, 2008 Quad Report, at 29.
[31] *Id*.
[32] *See*, generally, EQB Docket No. 03-67-EAW-NGP Biomass (available at http://energyfacilties.puc.state.mn.us/Docket.html?Id=4452).
[33] *See* MN DOC, 2008 Quad Report, at 25-27.

technologies will have an important impact, they are not likely to be the 'silver bullet' that solves all of our energy issues."[34]

5.2.1.7.1 Pumped Storage

The proposed site in Stearns County is not suited to a pumped storage application due to the need to store large amounts of water in an elevated reservoir. In addition, there is currently no net generation from pumped storage in Minnesota.[35] Accordingly, this technology is not an alternative to the Project.

5.2.1.7.2 Compressed Air

Highly specialized geological sites are needed to make use of compressed air technology. Such sites are scarce in Minnesota, and those that do exist are not located in the vicinity of the site. This technology is not yet commercially proven; accordingly, it is not an alternative to the Project.

5.2.1.7.3 Hydrogen and Fuel Cells

Hydrogen and its use in fuel cells has received a lot of attention for its potential to impact energy production and use. Fuel cells can be used to make electricity and heat to operate vehicles and buildings. Fuel cells use a chemical reaction rather than a combustion reaction, are more efficient than generation from combustion sources and have nearly no pollution. Hydrogen, on the other hand, is an energy carrier, not an energy source. As such, its potential to "store" electricity is being explored.

While much research is being done regarding hydrogen and fuel cells, the technology is not yet available on a commercial scale. It is possible, however, that as research and commercial applications advance, this technology may be used with and enhance other renewable technologies, such as the Project.

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[34] Minnesota Resource Assessment Study, p. 3.
[35] EIA, "Net Generation from Hydroelectric (Pumped Storage) Power by State by Sector," available at: http://www.eia.doe.gov/cneaf/electricity/epm/table1_15_b.xls (accessed August 22, 2011).

5.2.1.8 Non-CN Facilities (Minn. R. 7849.0120(A)(4))

Under *Minnesota Statutes*, Sections 216B.2421 and 216B.243, subd. 2, and *Minnesota Rules*, Chapter 7849, a CN is required for a "large energy facility," *i.e.*, a facility larger than 50 MW. As discussed in Section 2, the Black Oak & Getty projects began as two, separate non-CN facilities. Economics of scale and other efficiencies lead to the negotiations that prompted this application. The Applicants understand they must compete with other available technologies to secure a power purchase agreement with a utility. Accordingly, the Applicants will be compared to other non-CN facilities at the time they submit bids to utilities, and the utility will select resource based on a variety of factors, including price. As demonstrated by this Project's economics, the Applicants have the advantage of additional economies of scale not available to smaller, non-CN facilities.

5.2.1.9 No Facility Alternative (Minn. R. 7849.0340)

The Applicants requested an exemption from *Minnesota Rules*, Part 7849.0340, which requires an applicant to submit data for the alternative of "no facility," including a discussion of the impact of this alternative on the applicant's generation and transmission facilities, system, and operations. The Rule also requires an analysis "of equipment and measures that may be used to reduce the environmental impact of the alternative of no facility." *Minnesota Rules*, Part 7849.0340(C).

The Applicants do not have a "system," nor do they have other generation and transmission facilities in Minnesota. As such, the requirements of *Minnesota Rules*, Part 7849.0340 are not applicable to the Project and are not necessary to determine need for the facility. Instead, the Applicants are providing data regarding the impact of the "no facility" alternative on their potential customers and the region.

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' "25 by '25" requirements under the RES, 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 RES. Such an outcome is contrary to the Applicants' objective for the Project, and will not satisfy the state and regional need for renewable energy.

5.2.1.10 Facility Information for Alternatives Involving Construction of a LHVTL (Minn. R. 7849.0330)

The Commission granted the Applicants an exemption from *Minnesota Rules*, Part 7849.0330, which requires an applicant to provide certain data for each alternative that would involve construction of a large high voltage transmission line ("LHVTL"). The Applicants plan to construct between 3 ½ and 6 miles 69 kV transmission line from the project substation within the Project footprint to the Black Oak switching station to interconnect the wind farm to the transmission grid. Access to transmission facilities beyond the point of interconnection will be arranged by the utility or utilities purchasing the Project's energy output and will depend on the buyer and the ultimate destination of the energy output. Thus, except for the 69 kV transmission line necessary for interconnection to the Black Oak switching station, it is anticipated that the electricity generated will be transmitted via facilities owned or operated by others. For these reasons, *Minnesota Rules*, Part 7849.0330 is not applicable, and the Commission granted an exemption.

5.2.1.11 Combinations

No combination of the aforementioned alternatives would be appropriate because, as compared to the proposed Project, they would not enable the Applicants to more efficiently or cost-effectively produce electric output to be purchased by utilities to satisfy renewable energy requirements.

5.2.2 Economic Comparison

Table 5 below, taken from the EIA, demonstrates that wind energy has both a lower capital cost and a lower operating cost than other types of renewable resources. Wind is presently the most practical of all renewable generation and is the resource that Minnesota and the region expect to rely on most heavily to meet the region's growing need for renewable energy.

Table 5. Renewable Technology Costs[36]

Technology	Size (MW)	Total Overnight Cost in 2010 (2009 $/kW)	Variable O&M (2009 mills/kWh)	Fixed O&M (2009 $/kW)
Fuel Cells	10	6,752	0	345.80
Biomass	50	3,724	6.94	99.30
Landfill Gas	50	8,237	8.23	369.28
Conventional Hydropower[37]	500	2,221	2.42	13.55
Wind	100	2,409	0	27.73
Photovoltaic	150	4,636	0	63.23
Solar Thermal	100	5,132	0	58.05

5.2.3 Alternatives Summary

In summary, the Project is the best alternative for meeting the renewable energy needs of the local area in the near term. All other potential alternatives reviewed by the Applicants, including the use of alternative renewable resources or emerging technologies, non-CN facilities, or the no-build alternative, fall short in one or more categories.

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

The Commission granted the Applicants a partial exemption from *Minnesota Rules*, Part 7849.0250(C)(1)-(9), which requires a discussion of various details regarding both the proposed facility and each of the alternatives discussed in response to *Minnesota Rules*, Part 7849.0250(B). Consistent with the requested exemption from the data requirements in *Minnesota Rules*, Part 7849.0250(B), the Applicants have limited the discussion in this section to only those alternatives that satisfy the RES that could provide electric power at the asserted level of need. As discussed

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[36] The figures in this table are taken from a report of the U.S. Energy Information Administration, #:DOE/EIA-0554 (2011), release date July 2011, available at: http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554(2011).pdf (accessed July 15, 2011).

[37] EIA notes that the cost and performance characteristics from hydro are specific for each site, and therefore, the table entries represent the cost of the least expensive plant that could be built in the Northwest Power Pool region, where most of the proposed sites are located. It is not clear from the EIA data that a hydro plant could be built to serve Minnesota customers at the same costs. (See footnote 9 to Table 8.2 in DOE/EIA-0554.

above, no such alternatives exist. Therefore, only information regarding the proposed facility is applicable.

5.3.1 Capacity Cost in Dollars per Kilowatt

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 Project will deliver energy to utilities on an as-generated basis and will receive payment only for energy generated. The Applicants have estimated the cost for the Project to be approximately $1,860 - $1,975 per kW, pending final interconnection costs.

The largest component in the total cost of the Project will be the wind turbines; however, infrastructure costs for access road construction and electrical collection systems also are factors. When calculating the estimated costs, the Applicants assumed, on a per kW basis, wind turbine costs of **[TRADE SECRET DATA HAS BEEN EXCISED]**, construction costs of **[TRADE SECRET DATA HAS BEEN EXCISED]**, interconnection costs of **[TRADE SECRET DATA HAS BEEN EXCISED]**, and other development costs (including legal fees, developer fees, spare parts, reserve accounts and interest during construction from **[TRADE SECRET DATA HAS BEEN EXCISED]**.

5.3.2 Service Life

A service life of 30 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 30 years. The Applicants are confident that its maintenance program will result in excellent longevity for the Project.

5.3.3 Estimated Average Annual Availability

The Applicants estimate that the Project will be available at least 95 percent of the year, which is consistent with industry standards. The Applicants estimated the availability of the Project by studying industry standards, reports from independent engineers on similar projects, and from

Geronimo Wind Energy's experience with its two operating wind farms (the Marshall and Odin Wind Farms), both of which have maintained annual availability in excess of 95 percent. Furthermore, the Applicants expect to receive a contractual guarantee of availability from the wind turbine manufacturer of **[TRADE SECRET DATA HAS BEEN EXCISED]** percent for the first **[TRADE SECRET DATA HAS BEEN EXCISED]** years of plant life.

5.3.4 Fuel Costs

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 lease payments. Nominal purchases of electricity will be necessary to run the Project, with the Applicants ultimately selling the Project's net output.

5.3.5 Variable Operating and Maintenance Costs

Variable maintenance costs will likely be approximately $0.007 - $0.009 per kWh. In arriving at these costs, the Applicants utilized the turbine manufacturers' cost estimates for warranty service in the early years of the Project (years **[TRADE SECRET DATA HAS BEEN EXCISED]**), and for **[TRADE SECRET DATA HAS BEEN EXCISED]**. In addition, the Applicants made assumptions about the failure rates of major components and the Project's anticipated pre-emptive replacement schedule. The Applicants forecasted all of these costs in constant current dollars, and then applied a **[TRADE SECRET DATA HAS BEEN EXCISED]** percent inflation escalator.

In actual dollar amounts, the Applicants estimated approximately **[TRADE SECRET DATA HAS BEEN EXCISED]** per turbine annually for the operation and maintenance costs during the warranty period, plus about **[TRADE SECRET DATA HAS BEEN EXCISED]**/MWh in other expenses. The post warranty period assumptions included **[TRADE SECRET DATA HAS BEEN EXCISED]** per turbine annually plus about **[TRADE SECRET DATA HAS BEEN EXCISED]**/MWh in other expenses for years **[TRADE SECRET DATA HAS BEEN EXCISED]**,

plus an extra **[TRADE SECRET DATA HAS BEEN EXCISED]** per turbine annually for years **[TRADE SECRET DATA HAS BEEN EXCISED]** to account for potential generator and gearbox replacement. As noted above, all of these cost estimates were escalated **[TRADE SECRET DATA HAS BEEN EXCISED]** percent annually.

An advantage of wind energy facilities is that they typically do not require going completely offline for maintenance. Individual turbines can be serviced while the rest of the facility continues to deliver energy.

5.3.6 Total Cost

The Applicants estimate total capital costs to be approximately $0.014-$0.02 per kWh. This estimate assumes typical wind farm design, construction, and operational data for a 30-year estimated service life. This estimate also includes approximately $1.2 to $2.1 million in costs to construct the 69 kV transmission line interconnecting the project substation to the Black Oak switching station. The actual price for which the Applicants will sell the energy will be determined as a result of negotiations with the purchasing utilities.

5.3.7 Estimate of Facility's Effect on Rates

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 in-service date." The Applicants requested an exemption from this requirement because the Applicants not have "systems" as defined by the Rules and are not regulated utilities with regulated rates. As such, the data are neither available to the Applicants nor necessary to determine need for the proposed Project. Instead, this section discusses the potential impact of the Project on state and regional electricity prices.

The Project's energy production will be modest in comparison to the annual energy consumption of Minnesota and the region and will likely not have a measurable effect on rates. When aggregated

with other renewable projects, the Project could ultimately play a role in stabilizing or even lowering rates by offering an alternative to conventional generation sources. For instance, utilities would have the option of purchasing output from the Project to partially replace energy from generation sources with more volatile pricing, such as natural gas plants. In addition, the Project will not face the same cost-increasing hurdles to construction (*e.g.*, potential carbon regulation and higher permitting costs due to increased regulatory scrutiny) faced by conventional fossil-fuel generation sources. Specifically, the Federal Regulatory Energy Commission ("FERC") reported that there is a trend of increasing costs in the electrical markets and that this trend is exacerbated by constrictions in building conventional generating plants.[38]

Another indication that wind development should not significantly impact rates comes from the Minnesota Wind Integration Study. That study concluded that the operational effects of a wind power system when integrated into a local electric system were in line with conventional power, and thus will not impose undue costs on the system.[39] Overall, the study concludes that wind power can integrate into existing utility systems at a cost effective rate.[40] Further, according to the Minnesota Resource Assessment Study, complying with the RES is cost effective in a majority of the scenarios the Department evaluated in that study, assuming that wind was the predominant renewable resource used to meet the RES.[41]

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[38] *See Increasing Costs in the Electric Markets* (June 19, 2008) ("The two major factors pushing the costs of electric generation higher are increased fuel costs and increased cost for new construction. These factors affect all parts of the country. That is, higher future prices are likely to affect all regions."), a presentation by FERC at slide 2, available at www.puc.state.mn.us/portal/groups/public/documents/pdf_files/011697.pdf (accessed July 13, 2011).

[39] The report concluded there would be "no significant congestion issues attributable to wind generation and no periods of negative LMPs under the assumed transmission expansion." Minnesota Wind Integration Study Presentation (Dec. 2006) at Slide 18: http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000666.pdf (accessed July 13, 2011).

[40] *See id.* at Slide 19.

[41] Minnesota Resource Assessment Study, p. 95.

5.3.8 Efficiency

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

5.4 Map of System (Minn. R. 7849.0250(D))

The Applicants requested an exemption from *Minnesota Rules*, Part 7849.0250(D), which requires an applicant to include a map showing the applicant's system. The Applicants, as independent power producers, do not have a "system." The information requested is not available to the Applicants or relevant to the determination of need for its proposed Project. Instead, maps showing the Project location, the Project's preliminary site layout, current electrical infrastructure and proposed transmission infrastructure are attached as Figures 1, 2, 3 and 4 respectively.

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

The Applicants received an exemption from *Minnesota Rules*, Part 7849.0270, subparts 1-6, which require the applicant to provide "data concerning peak demand and annual electrical consumption within the applicant's service area and system." The Applicants do not have a "service area" or "system" and, as such, the requested data are inapplicable. Moreover, the Applicants will sell power generated by the Project to one or more utilities affiliated with different systems and serving different areas pursuant to PPAs or via the wholesale market. Given that the Applicants do not yet know who the buyer or buyers will be, they cannot reasonably forecast peak demand or consumption for those buyers' service areas and systems. As an alternative to the requested data, the Applicants provide the following data regarding the regional peak demand for energy and the forecasted future energy and demand requirements for the region, as well as information concerning Minnesota's requirements for additional renewable energy. Upon execution of a PPA for the Project's output, the Applicants will also provide the Commission with additional system-specific information, including the utility's most recently filed integrated resource plan ("IRP").

Renewable Energy Requirements. Since the Project is intended in part to provide renewable energy to help Minnesota utilities meet their respective RES requirements, a discussion of that matter first is appropriate. The need for additional renewable generation required by Minnesota's RES far exceeds the energy to be provided by the Project. Minnesota utilities have provided the Commission with projections of just how much additional renewable energy they will need to comply with upcoming RES milestones, in just Minnesota alone. These projections show that as much as 4,000 MW of new renewable energy sources will be required by 2025. More specific information is presented in Section 3.1 and a representative table is contained therein. The Minnesota Resource

Assessment Study also concluded, even when assuming aggressive demand side management achievements, that Minnesota would need to add an additional 4,000 MW of renewables by 2025.[42]

Regional Demand and Energy Forecasts. Forecasts show that regional utilities continue to have increasing demands for electrical energy, even assuming the implementation of aggressive conservation standards. In addition, a regional need exists for renewable energy. According to the MISO's 2010 Transmission Expansion Plan (MTEP 2010), the eleven states in the MISO region are expected to need approximately 25,000 MW of wind to meet existing renewable standards and objectives, yet have only achieved about 8,200 MW to date.[43]

This information confirms that the demand for energy, especially renewable energy, continues to grow in Minnesota and throughout the region as a whole.

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[42] Minnesota Resource Assessment Study, p. 3.
[43] MISO Transmission Expansion Plan 2010. Available at: www.midwestiso.org (accessed June 15, 2011).

7.0 System Capacity (Minn. R. 7849.0280)

Minnesota Rules, Part 7849.0280 requires a CN applicant to provide information on the ability of its existing system to meet the forecasted demand. Again, as independent power producers, the Applicants have no existing facilities to call on to meet that demand. Accordingly, the Commission granted Applicants an exemption from this requirement. As an alternative, the Applicants have provided information in Sections 3.1 and 6.0 regarding the current deficiency in renewable generation to meet the regional demand for renewable generation.

8.0 Conservation Programs (Minn. R. 7849.0290)

The Applicants requested an exemption from *Minnesota Rules*, Part 7849.0290, which requires an applicant to describe its energy and conservation plans, including load management, and the effect of conservation in reducing the applicant's need for new generation and transmission facilities.

The Commission has previously determined that this Rule is "designed to ensure that regulated utilities, providing essential services to captive customers, give conservation the same careful consideration they give to new generation in planning to meet the future needs of their service areas."[44] Different considerations apply in the wholesale context and thus the requirements of *Minnesota Rules*, Part 7849.0290 are "onerous and essentially unhelpful" to the Commission's determination.[45] Since the Applicants not regulated utilities and plan to sell the Project's output on the wholesale market, this requirement is inapplicable.

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[44] Rapids Power Exemption Order, at 6.
[45] *Id.*

9.0 Consequences of Delay (Minn. R. 7849.0300)

The Applicants received an exemption from *Minnesota Rules*, Part 7849.0300, which requires the applicant to discuss the "anticipated consequences to its system, neighboring systems, and the power pool should the proposed facility be delayed one, two, and three years, or postponed indefinitely." Neither Applicant is a utility nor do they have a "system" as defined by the Rules. Thus, this data requirement is inapplicable to the Applicants and is unnecessary to determine the need for the proposed Project. Instead, the Applicants provide the following data on the consequences of delay to its potential customers and the region.

The data presented by Minnesota electric utilities regarding their compliance with upcoming RES milestones provides evidence that the energy to be generated by the Project is needed. Xcel Energy's milestone in 2016 is 25%, and all other utilities must achieve 17% by 2016. Delaying an 82 MW wind project with the potential to generate between 280,145 and 323,244 MWh of electricity annually could jeopardize these utilities' efforts to obtain the necessary renewable energy in a cost-effective and reliable manner. While several utilities have met their RES requirements through 2016, a need remains to add significant additional renewables by 2020. Staging the acquisition of more renewable energy will help both the utilities system and impacts to ratepayers.[46]

The federal PTC, which provides a tax credit of 2.2 cents/kWh of energy produced is set to expire December 31, 2012. If this Project is delayed and unable to complete construction prior to the expiration of the PTC, the cost of energy produced by the Project is likely to increase significantly. As Xcel Energy has noted in other Commission filings, the utility considers it in ratepayers' best interest for Xcel to acquire renewable energy needed to meet the RES now, while wind energy prices are competitive with

[46] *See. e.g., In the Matter of the Petition of Xcel Energy for Approval of a Power Purchase Agreement with Geronimo Wind Energy, LLC*, Docket No. E002/M-11-713, at 118.

other available alternatives.[47] If this Project is delayed, it will likely increase the costs for utilities purchasing renewable power to meet their renewable energy requirements.

[47] *See*, *Id*. at 8.

10.0 Environmental Information for Proposed Project and Alternatives (Minn. R. 7849.0310)

Both Black Oak and Getty have submitted Site Permit applications, in addition to this Application for a CN. Included below is a summary of some of the impacts to key resources found within the Project area, including visual resources, land use, and wildlife. Additional environmental information is provided in Section 11, below, and in the Site Permit applications.

10.1 Impacts to Visual Resources

10.1.1 Visual Impacts and Mitigation

The placement of turbines will have an effect on the visual quality of the site and in nearby areas. However, discussion of the aesthetics of the proposed wind farm is based on subjective human responses. For some viewers, the Project could be perceived as a visual intrusion, characterized as "industrial" metal structures, up to 100 m (328 ft) high at hub height for the range of turbines considered, intruding on the natural aesthetic value of the landscape.

For other viewers, wind projects have their own positive aesthetic qualities, distinguishing them from other non-agricultural land uses. Operation of the wind farm will not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Project area will retain a rural sense and remote character. Also, although "industrial" in form and purpose, turbines are essentially "farming" the wind for energy. Although the turbines are high-tech in appearance, they are compatible with the rural and agricultural heritage of the area.

The Federal Aviation Administration (FAA) requires obstruction lighting or marking of structures over 200 ft above ground to provide safe air navigation. The Applicants will apply to the FAA for approval of a lighting plan that is compliant with FAA requirements. It is anticipated that approximately 50 percent of the turbines will be lit. FAA requires synchronized flashing of red

lights for wind turbines within a Project. The Applicants will also apply for tall structure permits from the Minnesota Department of Transportation (MnDOT).

While it may be true to some extent that the ability to see turbines in the background intrudes upon the purity of that experience, the same could be said of any human habitation or activity in the vicinity, and the presence of turbines may be have similar impacts as many such activities. Nonetheless, persons within the vicinity of the Project may perceive the Project to have negative effects.

The following are proposed mitigative measures:

- Turbines will be uniform in color;
- Turbines will not be located in biologically sensitive areas such as parks or wetlands;
- Turbines will be illuminated to meet the minimum requirements of FAA regulations;
- Existing roads will be used for construction and maintenance where possible to minimize the amount of new roads constructed; and
- Access roads created for the wind farm facility will be located on gentle grades to minimize erosion, visible cuts, and fills.

10.1.2 Shadow Flicker Impacts and Mitigation

Shadow flicker caused by wind turbines is defined as alternating changes in light intensity at a given stationary location, or receptor, such as the window of a home. In order for shadow flicker to occur, three conditions must be met: first, the sun must be shining with no clouds to obscure it; second, the rotor blades must be spinning and must be located between the receptor and the sun; and third, the receptor must be sufficiently close to the turbine to be able to distinguish a shadow created by it. Shadow flicker intensity and frequency at a given receptor are determined by a number of interacting factors:

- Sun angle and sun path – As the sun moves across the sky on a given day, shadows are longest during periods nearest sunrise and sunset, and shortest nearest midday. They are longer in winter than in summer. On the longest day of the year (the summer solstice), the sun's path tracks much farther to the north and much higher in the sky

than on the shortest day of the year (the winter solstice). As a result, the duration of shadow flicker at a given receptor will change significantly from one season to the next.

- Turbine and receptor locations – The frequency of shadow flicker at a given receptor tends to decrease with greater distance between turbine and receptor. The frequency of occurrence is also affected by the sightline direction between turbine and receptor. A turbine placed due east of a given receptor will cause shadow flicker at the receptor at some point during the year while a turbine placed due north of the same receptor at the same distance will not, due to the path of the sun.

- Cloud cover and degree of visibility – As noted above, shadow flicker will not occur when the sun is obscured by clouds. A clear day has more opportunity for shadow flicker than a cloudy day. Likewise, smoke, fog, haze, or other phenomena limiting visibility would reduce the intensity of the shadow flicker.

- Wind Direction – The size of the area affected by shadow flicker caused by a single wind turbine is based on the direction that the turbine is facing in relation to the sun and location of the receptor. The turbine is designed to rotate to face into the wind, and as a result, turbine direction is determined by wind direction. Shadow flicker will affect a larger area if the wind is blowing from a direction such that the turbine rotor is near perpendicular to the sun-receptor view line. Similarly, shadow flicker will affect a smaller area if the wind is blowing from a direction such that the turbine rotor is near parallel to the sun-receptor view line.

- Wind Speed – Shadow flicker can only occur if the turbine is in operation. Turbines are designed to operate within a specific range of wind speeds. If the wind speed is too low (cut-in speed) or too high (cut-out speed), the turbine will not operate, eliminating shadow flicker.

- Obstacles – Obstacles, such as trees or buildings, which lie between the wind turbine and the receptor have a screening effect and can reduce or eliminate the occurrence of shadow flicker.

- Contrast – Because shadow flicker is defined as a change in light intensity, the effects of shadow flicker can be reduced by increasing the amount of light within a home or room experiencing shadow flicker.

- Local topography – Changes in elevation between the turbine location and the receptor can either reduce or increase frequency of occurrence of shadow flicker, compared to flat terrain.

Shadow flicker frequency calculations for the Project were modeled for 204 residences (receptors) with WindPRO's Shadow Module. Both the expected case and the worst case scenarios were modeled. In summary, the maximum expected shadow flicker at any residence is less than 1% of annual daylight. The maximum predicted shadow flicker impacts that occurred at a residence for each turbine layout is shown in Table 6.

Table 6 – Maximum predicted shadow flicker impacts

Statistic	Hours / Year
Max - Worst Case	79.0
Avg - Worst Case	7.7
Max - Real Case	25.2
Avg - Real Case	2.5

The annual daylight in 2011 which is the number of hours the sun is above the horizon at Latitude of 45.65° and Longitude of 94.98° is 4466 hours. By simulating the sun path throughout a whole year, WindPRO calculates the number of hours per year as well as maximum minutes per day during which a given receptor could realistically expect to be exposed to shadow flicker from nearby wind turbines. Simulated conditions for the worst case scenario where:

- There is always sunshine,
- The turbines are always in operation,
- The wind direction always orients the rotors perpendicular to the sun-receptor sightline,
- There are no local obstacles blocking potential shadows such as buildings or vegetation,

- Specific window configurations on houses are not considered, and
- Receptors are assumed to be exposed to the sky in all directions, and the shielding influence of terrain is not considered ("greenhouse receptors").

The worst case scenario model was refined to represent a less conservative expected scenario by incorporating the following more realistic features in the expected case scenario model:

- Wind Direction – Turbine rotors do not orient themselves to the sun all day, every day, as modeled in the worst case scenario. To adjust for actual rotor direction, wind data is entered into the model. For the analysis included in this application, wind data was taken from the temporary meteorological tower located in the Project Boundary.

- Turbine Operating Hours – The turbine will not be operational all of the time due to local winds being outside of turbine operation specifications, or due to maintenance. Project specific wind rose data again was incorporated to reflect the frequency of sufficient wind speed to activate the turbine. The expected percentage of time the turbine is activated is multiplied by the number of minutes of shadow flicker.

- Actual Sunshine Hours – Sunshine hours are affected by cloud cover, fog or haze, time of day, and time of year. This data is provided by the WindPro software which selects the nearest weather station from its database.

Combining these three mitigating factors creates a less conservative scenario which aims to produce a scenario closet to the actual expected results. These "expected" results represent a significant reduction in shadow flicker hours per day or per year in contrast to a worst case scenario. However, by including the above factors into the model, it is possible – though not likely- to have lower modeled results compared to actual results in the field. This is due to the fact that true meteorological factors like wind direction or sunshine hours could be different from the averages used in a way that is worse for shadow flicker.

The Applicants will minimize the potential for shadow flicker for all residences, participating and non-participating, when siting wind turbines. The Applicants will provide a shadow flicker analysis prior to the preconstruction meeting, and an opportunity to review the shadow flicker investigation

will be provided to any residences anticipated to experience more than 0.5% of annual daylight flicker. Beyond these conservative measures of siting to prevent shadow flicker, other mitigation measures will be considered and implemented on a case-by-case basis. Shadow flicker will be addressed as situations arise wherein a residence is experiencing inordinately more shadow flicker than is anticipated in the modeling, although it is highly unlikely more flicker than modeled will occur. Shadow flicker occurrences shall be documented by the residence daily for several consecutive months including time of day and duration. Documentation must include the location of where the shadow flicker is occurring at and thus disturbing the residence (such as a window or front porch), as well as the location of the turbine causing the flicker. Upon verification of the shadow flicker occurrences, the Applicants will take mitigation measures. Mitigation measures will be determined by the individual circumstances of residences experiencing shadow flicker, and as a reasonable function of the amount of flicker experienced. Such mitigation measures may include:

- Providing education about how to minimize the effect of shadow flicker.
- Providing indoor screening, such as curtains or blinds in windows, where appropriate and reasonable.
- Providing exterior screening such as a vegetation buffer or awnings over windows where appropriate and reasonable.
- Turbine Control Software programmed to temporarily shut down a specific turbine for a few minutes if conditions are present to create flicker.

10.2 Impacts to Land Use

The Project area includes a total of approximately 14,600 acres of land, and the Applicants currently have site control over approximately 11,200 of these acres. Of these acres, only about one-tenth of one percent will be permanently converted from agricultural fields to sites for wind turbines, access roads, and transformer pads. With respect to turbine pads and access roads, only approximately 50 acres of land will be converted for the 1.5 MW turbines, approximately 45.8 acres

of land will be converted for 1.8 MW turbines, and approximately 31.5 acres will be converted for the 3.0 MW turbines. Approximately 13 to 23 acres of land will be converted for the access roads. One additional acre of land will be used for construction of the project substation. The Applicants currently anticipate building the O&M facility at an off-site location in an established industrial park with proper transportation, communications facilities, and easy access to the Project. The existing land use will continue on the remainder of the land. No relocation of people or businesses will be necessary for the Project. Thus, the land use impact will be minimal.

10.3 Impacts to Wildlife

10.3.1 Impacts

Development of the Project, including construction and operation, is expected to produce minimal impacts on wildlife. Based on studies of existing wind power projects in the United States and Europe, the impacts on wildlife would primarily occur within avian and bat populations. The final report for the Project (HDR 2011) concluded that, similar to other wind developments, there is a high likelihood that individual bird fatalities will occur, but that it is unlikely to affect populations of most species, especially at a regional scale. Similar to the Paynesville Wind Resource area, grassland (including potential native prairie) and wetlands with semi-permanent and permanent open water within the Project area are limited to the WMAs and WPAs. The report (HDR 2011) and results of the study have been used to identify corridors of bird use that the Applicants are avoiding when siting turbines.

The Project occupies approximately 20 square miles of cropland, grassland, isolated wetland, and small woodlots. Within the Project boundaries are numerous lakes, wetlands, and ditches that attract waterfowl and waterbirds. Several Waterfowl Production Areas (WPAs) and Waterfowl Management Areas (WMAs) also occur near or within the project boundaries. Many Project area wetlands are ephemeral in nature and express surface water only early in the spring or after a heavy rain. In order

to facilitate row cropping, some Project area ephemeral basins have been ditched or tiled to remove surface water quickly.

Under the guidance of the US Fish and Wildlife Service (USFWS), the Minnesota Department of Commerce Energy Facility Permitting (EFP), and the Minnesota Department of Natural Resources (DNR), HDR Engineering, Inc., (HDR) developed biological survey protocols to address concerns about avian/wind turbine collisions, the disruption of avian flights, and wind project site use by bald eagles, marbled godwits, waterfowl, and other avian species of concern. These protocols characterize risks to avian species at wind development sites.

For the Project, specific issues of concern included the present and historic use by bald eagles, marbled godwits, trumpeter swans, loons, and other selected Species of Greatest Conservation Need (SGCN). HDR was retained to evaluate avian use at the Project (Figure 1). The resulting surveys included a spring Avian Use/Flight Path survey, an Avian Wetland Utilization survey, Marbled Godwit nesting surveys, and a Bald Eagle Nest monitoring effort.

HDR biologists conducted Avian Use/Flight Path surveys to document all avian species and their associated flight paths at 11 survey points from April 1 through June 29, 2011. HDR estimated flight height, flight direction, distance from the survey point, and flight behavior of more than 106 different species during these surveys. An additional 10 species were observed during the three other surveys. HDR plotted flight paths on aerial photographs then digitized them using ArcGIS software to analyze flight information. No distinct flight corridors were identified for any particular species within the Project boundaries. However, grouping the data according to broad categories (i.e. waterfowl, waterbirds, raptors, passerines, etc.) may facilitate planning, micro-siting, minimizing impacts to sensitive species, and avoiding impacts to avian concentration areas or other high use areas that occur on the site during certain times of the year.

HDR biologists documented 22,863 individual birds made up of 116 different species during 23 separate monitoring dates. Four species identified by the DNR as endangered, threatened, or special

concern (ETSC), and 22 species designated as a SGCN were documented within project boundaries during the spring of 2011. An additional three ETSC species were observed outside project boundaries but within the study area. The seven ETSC species and the SGCN species together are referred to as sensitive species throughout the remainder of the document. Flight heights varied between species and individuals but biologists assessed flight trends by establishing a Mean Flight Height for each species observed. HDR also analyzed observation and flight data for four sensitive species avian groupings that included waterfowl, waterbirds, raptors, and passerines. The percentage of observed flights within the Rotor Swept Zone (RSZ, between 24 and 150 m above ground level (AGL)) was 24.0 percent for raptors, 33.1 percent for waterbirds, 37.6 percent for waterfowl, and 3.3 percent for passerines. However, a bias does exist toward birds that fly closer to the ground as they are more easily detected by observers.

HDR staff also monitored four wetlands near or within the project boundaries for waterfowl and waterbird use on nine separate occasions from April 7 through May 20, 2011. Use by 36 species and 1,472 individuals was documented in the four selected wetland complexes. The most commonly observed species were the American coot (50 percent of all observations) and ring-necked duck (8 percent of all observations). These surveys also documented the presence of breeding marbled godwits adjacent to the Project's southern boundaries.

Biologists conducted marbled godwit surveys on April 19, May 10, and June 9, 2011, at the Kenna WPA, Trisko WPA, and Behnen WPA. The three WPAs are located immediately adjacent to or within the Project boundaries. The purpose of this survey was to detect the presence or absence of breeding marbled godwits within the Black Oak/Getty Wind Farms. The DNR and USFWS requested the surveys based on historic records for this species on grassland habitats in the Project vicinity. No marbled godwits were detected during these surveys.

An active Bald Eagle nest discovered during the first week of Avian Use/Flight Path surveys was monitored weekly from April 7 through July 12, 2011. Raptors were present in low numbers at the

site throughout the survey period. However, six different raptor species were observed using land on or adjacent to the Black Oak/Getty Wind Farms. Of the six raptor species observed, the red-tailed hawk and American kestrel are known to be susceptible to increased mortality rates from wind development due to flight behavior. Horned larks and vesper sparrows were abundant and are considered potentially sensitive to habitat displacement and higher mortality rates from wind development. During the breeding season, the vesper sparrow occurred in cropland habitat. Horned larks were present at all Avian Use/Flight Path observation points throughout the survey period.

Based on the results of previous studies, the land cover types within the Project area, and the similarity of species composition between the Buffalo Ridge WRA, the Paynesville WRA, and the Project area, the impact of the proposed Project on wildlife is expected to be minimal. There is potential for avian and bat collisions with facility turbines or meteorological towers. Additional impacts may include a small reduction in the available habitat that some wildlife uses for forage or cover; however, operation of the wind farm will not change the existing land use.

10.3.2 Mitigation Measures

The Applicant conducted avian use/flight path surveys, wetland utilization surveys, marbled godwit surveys, raptor nest searches, and eagle nest monitoring studies during the spring of 2011. Based on the results of these studies, the Applicant will work with the MDNR and USFWS to develop turbine placements that will minimize affects on birds present within the Project site. In addition, the Applicant will implement the measures discussed in this section to the extent practicable to help avoid potential impacts to wildlife in the Project area during selection of the turbine locations and subsequent Project development and operation.

The Applicants will design their facility to minimize avian impacts by avoiding high use wildlife habitat (woodlands, wetlands, and WMAs/WPAs), using tubular towers to minimize perching, placing electrical collection lines underground as is practicable and minimizing infrastructure. The

Applicants continue to consult with the MPUC, USFWS, and MDNR regarding appropriate mitigation measures for wildlife impacts.

Based on the preliminary site screening process and agency consultation with the MDNR and USFWS, a Tier III study of marbled godwits and bald eagle use at the Project was conducted during the spring of 2011 to gather more information on these species' use of the site. The results of these studies indicate that an active bald eagle nest is present at the north end of the Padua WMA and some use of small wetlands and grasslands by marbled godwits occurred adjacent to the Trisko WPA. Although no observations of courtship displays or regular use of lands within the Project boundary occurred for bald eagles or marbled godwits, three flights by the eagles were noted between the active nest site and the City of Sauk Center to the north. These flights took the adult eagles across the series of wetlands north of the Padua WMA, over the Trisko WPA, then northeasterly to Sauk Center. In addition, a single observation of a marbled godwit adjacent to the Trisko WPA indicates there is likely some use of the site by this species for foraging or for breeding when appropriate habitat parameters are present in grasslands within the Project boundary.

Analysis of flight path data identified significant movement and concentration areas within the Project. These areas lie in a broad corridor stretching from the Padua WMA south of the project boundaries northward through Trisko WPA then northeast or northwest to the Sauk River. Waterbodies associated with the Raymond Lake/Padua WMA are the source or destination of many of the flights that were observed during the spring of 2011 study. This area also harbors a perennial nest location for bald eagles, nesting red-necked grebes, a black tern colony, occasional use by sandhill cranes, and frequent common loon use. Since collision risk is related to local abundance at some level, flight physiology (i.e. wing loading characteristics), with behavior an important additional factor, ETSC, SGCN, waterfowl and other sensitive species that utilize flight paths between wetland and lake areas will be considered when designing turbine arrays and associated infrastructure, with a goal to minimize placement of infrastructure in these high use areas.

Additionally, direct impact to the eagle nest site and two waterbird congregation areas identified during spring avian surveys will be avoided. Prairie areas identified during the spring avian surveys within the Trisko WPA will be avoided. Although wetlands, including cropped wetlands, within the Project boundary are used as stopover sites during spring migration, as the MDNR noted, the wetlands within the Project boundary are similar in size, quality, and density to those in the adjacent landscape. Because the Project area has landscape features and cover types similar to both the Buffalo Ridge and Paynesville WRAs, there is substantial existing data available to predict avian and bat impacts from comparable sites. Therefore, no additional studies are proposed for the Project. The Applicants will continue to coordinate with the USFWS and MDNR on issues addressed by the agencies as the Project layout is developed. In addition, the Applicants plan to prepare an Avian and Bat Protection Plan to address additional measures the Applicants will take to protect and minimize impacts to avian and bat species.

11.0 Facility Information for Proposed Project and Alternatives Involving Construction of a LEGF (Minn. R. 7849.0320)

11.1 Land Requirements (Minn. R. 7849.0320(A))

The Project is located on land that is zoned for agricultural use. The Project will remove a total of between approximately 29 and 50 acres from agricultural use. Typical wind farms require approximately one-half acre per turbine for the turbine pad, transformer, access road, and associated infrastructure. The land requirements for the Project are consistent with the requirements for wind projects of a similar size. No relocation of people or businesses will be necessary for the Project.

11.1.1 Land requirements for water storage

The Project will not require any land for water storage.

11.1.2 Land requirements for cooling system

The Project will not require any land for a cooling system.

11.1.3 Land requirements for solid waste storage

The Project will require minimal space in the maintenance facility for the storage of used oil and other lubricants, as well as for spare parts and tools.

11.2 Traffic (Minn. R. 7849.0320(B))

The maximum construction workforce is expected to generate approximately 240 peak additional vehicle trips per day. The functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. The highest existing Annual Average Daily Traffic ("AADT") in or near the Project area is 2,412 vehicles per day along State Highway 28 and 2,350 vehicles per day along U.S. Highway 71. Along the county highways, the AADTs are generally below 225 vehicles per day. Since many of the area roadways have AADTs currently well below capacity, the addition of an

average 200 to 240 additional vehicle trips during construction would be perceptible, but similar to seasonal variations such as autumn harvest.

Truck access to the Project area is generally served by U.S. Highway 71 and State Highway 28. Specific additional truck routes will be dictated by the location required for delivery. Additional operating permits will be obtained for over-sized truck movements.

The operations phase of the new Project will require a small 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 traffic for occasional turbine and substation repair, but no impacts to traffic function would result from this small increase.

The Project is not expected to have any impact on rail or barge traffic during construction or operation.

11.3 Information Pertaining to Fossil-Fueled Facilities (Minn. R. 7849.0320(C-D))

11.3.1 Fuel

The Project is not a fossil-fueled facility. The Project will be "fueled" by wind.

11.3.2 Emissions

The Project is not a fossil-fueled facility and will not release any emissions from the power generation process.

11.4 Water Usage for Alternate Cooling Systems (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. The water requirements of the O&M building will be met either through the local rural water service, or the installation of a well in accordance with applicable regulations.

11.5 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 O&M building may require a septic system, which will be installed in accordance with applicable regulations.

11.6 Radioactive Releases (Minn. R. 7849.0320(G))

The Project will not produce any radioactive releases.

11.7 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. These wastes and their disposition are summarized in Table 7.

Table 7: Wastes Generated by Project

Waste	Solid/ Liquid	Description	Generation Rate	Disposition Method
Oil/Grease	L/S	Hydraulic fluid, lubrication oil, grease	~6.8 tons/yr	Used oil recycler, incinerator
Maintenance Materials	S	Oily and greasy rags, materials packaging, cleaning residues, fluorescent light bulbs	~2.25 tons/yr	Solid waste landfill or, as necessary, hazardous waste treatment/disposal facility

11.8 Noise (Minn. R. 7849.0320(I))

When in motion, wind turbines emit a perceptible sound. The level of this sound varies with the speed of the turbine and the distance of the listener from the turbine. Sound is generated from the wind turbine at points near the hub or nacelle, 80 to 100 m (262 to 328 ft) in the air, and from the blade tips as they rotate. The Applicants' sound analysis accounts for all noise-generating elements associated with wind turbines.

Project-related noise levels, resulting from all proposed wind turbines, were calculated at residences using an ISO-9613 compliant sound model built into the openWind® wind farm design software. This model, designed for evaluating environmental noise from stationary and mobile sources, was used to calculate the L_{eq} for all three proposed turbine models. By assuming that wind speeds are constant for an entire one-hour period, the L_{eq} calculated by openWind® can be compared to the Minnesota Pollution Control Agency's (MPCA) L50 standard. The MDH white paper indicates a 5 dBA buffer provides an adequate surrogate for low-frequency noise. The nighttime L50 standard is the most stringent noise limit in the MPCA standards; therefore, when combined with the 5 dBA buffer suggested by the MDH white paper, analysis results are appropriate and conservative for evaluating the acceptability of calculated wind turbine noise levels.

All proposed wind turbines (noise sources) were modeled in openWind® and project-related noise levels were calculated at 204 noise-sensitive receptors within the Project Area. Table 8 presents analysis results.

Table 8: Project Related Noise Levels

Turbine Make and Model	Maximum Project Related Leq, dBA	Average Project-Related Leq, dBA
Goldwind GW 87	45	32.6
Repower MM100	44	32
Vestas V112	45	33

The maximum calculated noise level, based on assumptions incorporated into the openWind® model and the most current turbine layout, results in a 45 dBA Leq at the nearest noise-sensitive receptor. Average project-related noise levels at residences for all turbine models range from 18 – 45 dBA, on an hourly Leq basis. All proposed turbine layouts comply with MPCA noise guidelines.

Maximum calculated noise levels for all turbine models are at least 5dB below the nighttime L50 noise limit of 50 dBA.

11.9 Work Force for Construction and Operation (Minn. R. 7849.0320(J))

Construction of the Project is expected to commence second quarter in 2012 and be completed by fourth quarter 2012. During this time, approximately 90 to 135 construction jobs will likely be created. Four to six permanent positions will likely be created to operate the Project.

The civil contractor will be the lead entity for the construction management of the Project. The primary civil, erection and electrical contractors will use, where possible, the services of local contractors to assist in the construction of the Project.

The Applicants will augment the O&M staff as needed with appropriate contractors to service and maintain the Project. The operations phase of the Project will require a two-person maintenance crew driving through the area to monitor and maintain the wind turbines.

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

At the base of each turbine a step-up transformer will be installed to raise the voltage to power collection line voltage of 34.5 kV. Power will be run through an underground and/or overhead collection system. Generally, the electrical lines will be buried in trenches and run to the edge of the farm field. At the public road at the edge of the farm field, the power collection lines will either rise from underground to overhead lines or continue as underground lines. The collection lines will occasionally require an aboveground junction box when the collection lines from separate spools need to be spliced together.

The Project has two interconnection requests with the Midwest Independent System Operator (MISO) system located at Xcel's Black Oak switching station, which is located approximately 3 ½ miles east of the Project footprint. The collection systems from both the Black Oak and Getty

footprints will run to a new, common project substation where the power will be stepped up from 34.5 kV to 69 kV. The Project will then build a 69 kV transmission line from the Project substation to an existing station bay or a new bay in the Black Oak switching station. The transmission line will be located on private land, and the Project has voluntarily acquired all easements required to construct and operate the Project's transmission line. Figure 4 shows the locations of the planned substation and transmission line.

The interconnection details will be determined as a result of studies, discussions, and agreements with MISO. Access to transmission facilities beyond interconnection will be arranged by the utility or utilities purchasing the Project's energy output, and will depend on the buyer and the ultimate destination for the energy output.

12.0 Other Filings and Permits

12.1 Exemption Request

On May 24, 2011, the Applicants requested an exemption from several of the informational requirements of *Minnesota Rules*, Chapter 7849. On August 22, 2011, the Commission issued an order granting all of the requested exemptions.

12.2 Environmental Report

Pursuant to *Minnesota Rules*, Parts 7849.1000 to 7849.2100, the DOC is required to prepare an Environmental Report for any large energy facility for which a CN must be obtained.

12.3 Site Permit

The Applicants are seeking separate site permits for the Black Oak and Getty Projects. Black Oak submitted an amended site permit application for an up to 42 MW large wind energy conversion system, as required by *Minnesota Statutes*, Section 216F.04 (2010), on January 14, 2011. Getty is submitting an application for an up to 40 MW LWECS concurrent with this CN application.

12.4 Other Project Permits

Project permits and approvals that may be necessary to complete the Project are listed in Table 9. The Applicants will obtain these approvals, as necessary, prior to project construction.

Table 9: Project Permits and Approvals

Agency	Permit/ Approval	Need for Permit/ Approval
Federal		
U.S. Army Corps of Engineers (USACE)	Review and Approval of Wetland Delineations	Required to determine extent of USACE jurisdiction, quantify impacts, or document avoidance.

Agency	Permit/ Approval	Need for Permit/ Approval
	Jurisdictional Determination	The Project may be eligible for a Letter of No Jurisdiction if wetlands are avoided or impacts are limited to isolated wetlands.
	Federal Clean Water Act Section 404 Permit(s)	Project may require a USACE Regional General Permit or an Ind. Permit depending on amount and type of wetland impact proposed. Permit from USACE required if wetlands are jurisdictional and not avoidable.
U.S. Fish and Wildlife Service	Letter of No Effect for Threatened and Endangered Species	Federal endangered species review is needed to confirm that the Project will not adversely affect rare species and that no "incidental take" permit is needed.
Environmental Protection Agency (Region 5) (EPA) in coordination with the Minnesota Pollution Control Agency (MPCA)	Spill Prevention Control and Countermeasure (SPCC) Plan	May be required if turbine commissioning or construction activities will require oil storage in excess of 1320 gallons. May be required for O&M facility or if an oil storage tank is planned for this Project.
Lead Federal Agency	Federal Section 106 Review	Section 106 of the National Historic Preservation Act (NHPA) may be invoked by a Federal Agency if the Project requires federal land, funding, or permits.
Federal Aviation Administration	Form 7460-1 Notice of Proposed Construction or Alteration (Determination of No Hazard)	Determination of No Hazard to Air Navigation needed for each structure over 200 feet tall via form 7460-1.
	Notice of Actual Construction or Alteration (Form 7460-2)	Notify FAA of construction via Form 7460-2.
Federal Land Manager (BLM, USBR, Forest	Right-of-Way Grant over federal lands	Does not currently apply to this project.

Agency	Permit/ Approval	Need for Permit/ Approval
Service)		
National Historic Preservation Act	Class I Literature Review / Class III Cultural Field Survey	Typical required for MN LWECS Site Permit compliance
U.S. Department of Agriculture	Form AD-1006 *(for construction on soil categories except 'not prime farmland').*	May be required if Federal Agencies are involved then the Farmland Protection Policy Act (FPPA) requires a review of the conversion of prime farmland to other uses.
Federal Communications Commission	Non-Federally Licensed Microwave Study	Typical required for MN LWECS Site Permit compliance
	NTIA Comm. Study	Typical required for MN LWECS Site Permit compliance
	Communication Study	Typical required for MN LWECS Site Permit compliance
	Signal strength assessment	May be required for MN LWECS Site Permit compliance
	Onsite Signal strength assessment	May be required for MN LWECS Site Permit compliance
FERC	Exempt Wholesale Generator Cert. (EWG)	Self-Certification - Needed after GIA is completed to sell power
	Market-based rate Authorization	Determine if MBA is needed
Department of Transportation (FHWA)	Utility Line Crossing License	May be required for transmission line crossing US Highway 71
Environmental Protection Agency	Phase 1 EA	Project Financing may require a Phase 1 ESA
State		
Minnesota Public Utilities Commission (PUC)	Large Wind Energy Conversion System (LWECS) Site Permit	Required under Minnesota Statute Section 216F.03 for a LWECS that generates 5 MW or more of electricity.

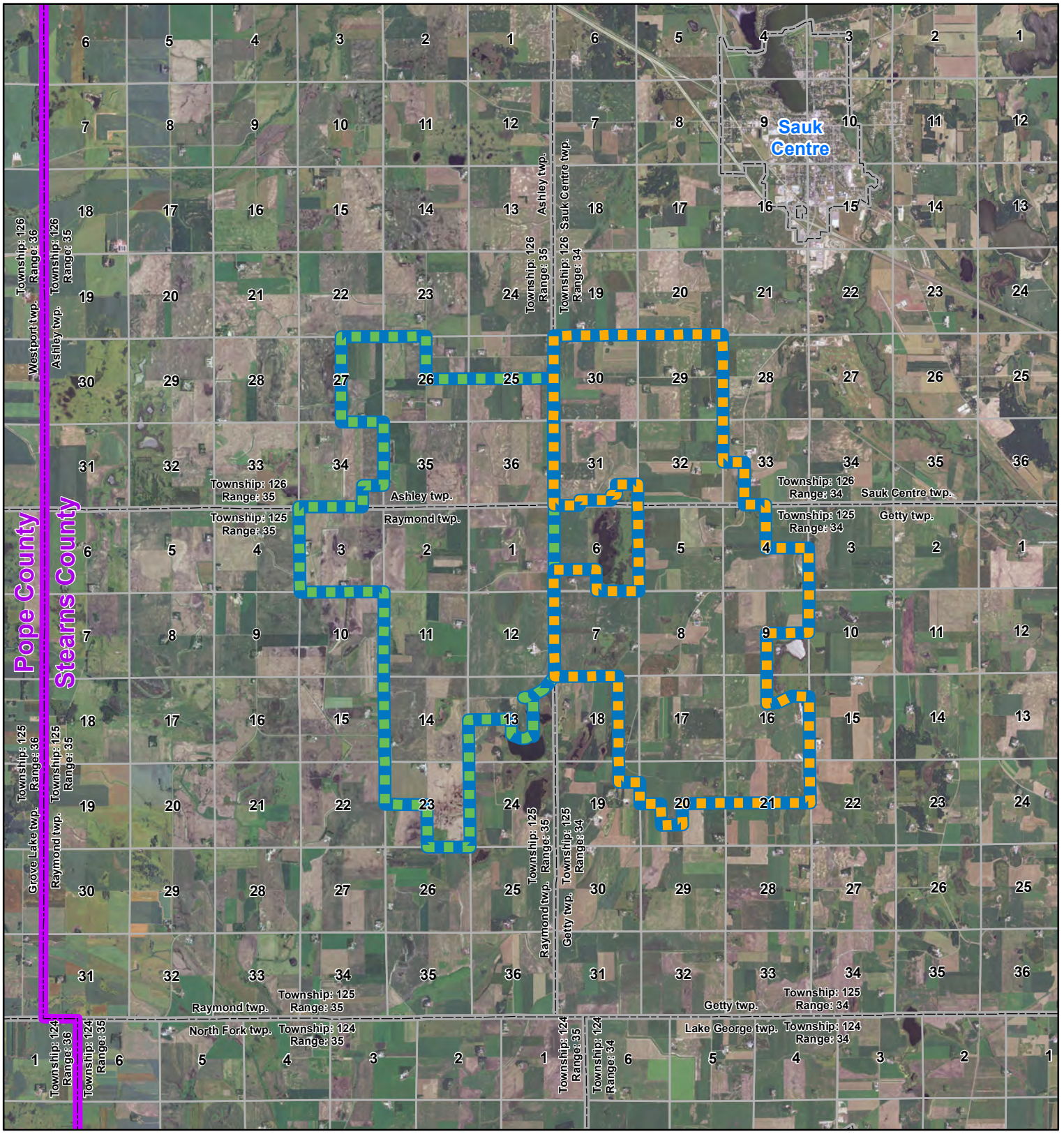
Agency	Permit/ Approval	Need for Permit/ Approval
	Certificate of Need (CN)	A CN is required under Minnesota Statute Section 216B.243 for a LWECS unless the project meets exemption criteria set forth within Minnesota Statutes.
	Power Purchase Agreements	C-BED PPA requires approval of MN PUC
Minnesota State Historic Preservation Office (SHPO)	Cultural and Historic Resources Review and Review of State and National Register of Historic Sites and Archeological Survey	Consultation with SHPO is recommended. Should Section 106 of the National Historic Preservation Act (NHPA) be triggered, consultation will be mandatory.
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Individual Section 401 Water Quality Certification or Waiver is required under the Federal Clean Water Act (CWA) for projects that require an Individual Section 404 Permit from the USACE to ensure that authorized activities do not violate state water quality standards.
	National Pollutant Discharge Elimination System Permit (NPDES) – MPCA General Storm water Permit for Construction Activity (MN R100001)	Coverage under the MPCA General Storm water Permit for Construction Activity is required for projects that disturb more than one acre of land.
	Very Small Quantity Generator (VSQG) License – Hazardous Waste Collection Program	May be required for O&M facility
	Aboveground Storage Tank (AST) Notification Form	The storage of oil is subject to regulation per Minnesota Rules Chapter 7151. Facilities with a storage capacity that exceeds 1,100 gallons must also meet Spill Prevention, Control, and Countermeasure (SPCC) requirements (EPA requirements concerning SPCC are discussed previously).

Agency	Permit/ Approval	Need for Permit/ Approval
Minnesota Department of Health (MDH)	Environmental Bore Hole (EBH)	EBH's are regulated by the MDH and the contractor drilling the EBH must be a Minnesota licensed well contractor or Minnesota registered monitoring well contractor boring in conformance with Minnesota Rules Chapter 4725.7450
	Water Supply Well Notification	May be required for O&M facility
	Plumbing Plan Review	May be required for O&M facility
Minnesota Department of Transportation	Utility Agreements and Permits	Minnesota Statute Section 161 requires a permit to place utility facilities on trunk highway rights-of-way.
	Oversize/Overweight Permit for State Highways	Under Minnesota Statute Section 169, a permit is required for hauling construction equipment and materials that exceed height and weight limits on U.S., Interstate, and state highways through Minnesota.
	Tall Structure Permit	Structure more than 200 feet above ground level within 3 miles of an airport and increasing by 100 feet for each additional mile out to 6 miles and 500 feet
	Access Driveway Permits for MNDot Roads (TP-1721)	Permit for temporary or permanent accesses and temporary widening of accesses points.
Minnesota Department of Natural Resources	License for crossing Public Lands and Waters (Minn. Stats. 84.415)	Required for wind farm facilities that cross or locate on State administered Public Lands or Waters
	Public Waters Work Permit (Minn. Stats. 103G)	Any construction activities that impact waterways, including Wetlands, applies to public waters that are identified on MDNR public waters inventory maps
Local		

Agency	Permit/ Approval	Need for Permit/ Approval
Stearns County	Road Agreements	Oversize/overweight permits and road repair agreement (may combine with TWPs)
	Development Agreement	May be required
	Building Permits Turbines	May be required
	Building Permits Substation	Required to start construction
	Building Permits Operation and Maintenance Building	Required to start construction
	Access road permits	Required to start construction
	CUP for T-Line	Required to start construction
	CUP for Substation	Required to start construction
Townships	Road Agreements	Oversize/overweight permits and road repair agreement (may combine with County)
	Development Agreement	May be required
	Building Permits Turbines	May be required
	Building Permits Substations	May be required
	Access road permits	Required to start construction
Stearns County Soil and Water Conservation District	Approval Wetlands delineations	Onsite review of Wetlands delineation for Compliance with Wetland Conservation Act
Other		
MISO (RTO)	Turbine Change Study	May be required if final turbines differ from Interconnection Request
	Generator Interconnect Agreement (GIA)	Permission to connect and delivery power on Midwest ISO's high voltage transmission system.

FIGURES

FIGURE 1 PROJECT LOCATIONS



LEGEND

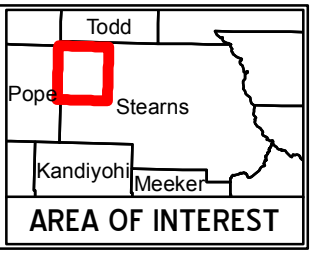
Black Oak | Getty | Municipal Boundaries | County Boundaries

0 0.5 1 2
Miles

DATA SOURCES:
GERONIMO WIND ENERGY
USDA/NRCS
ESRI

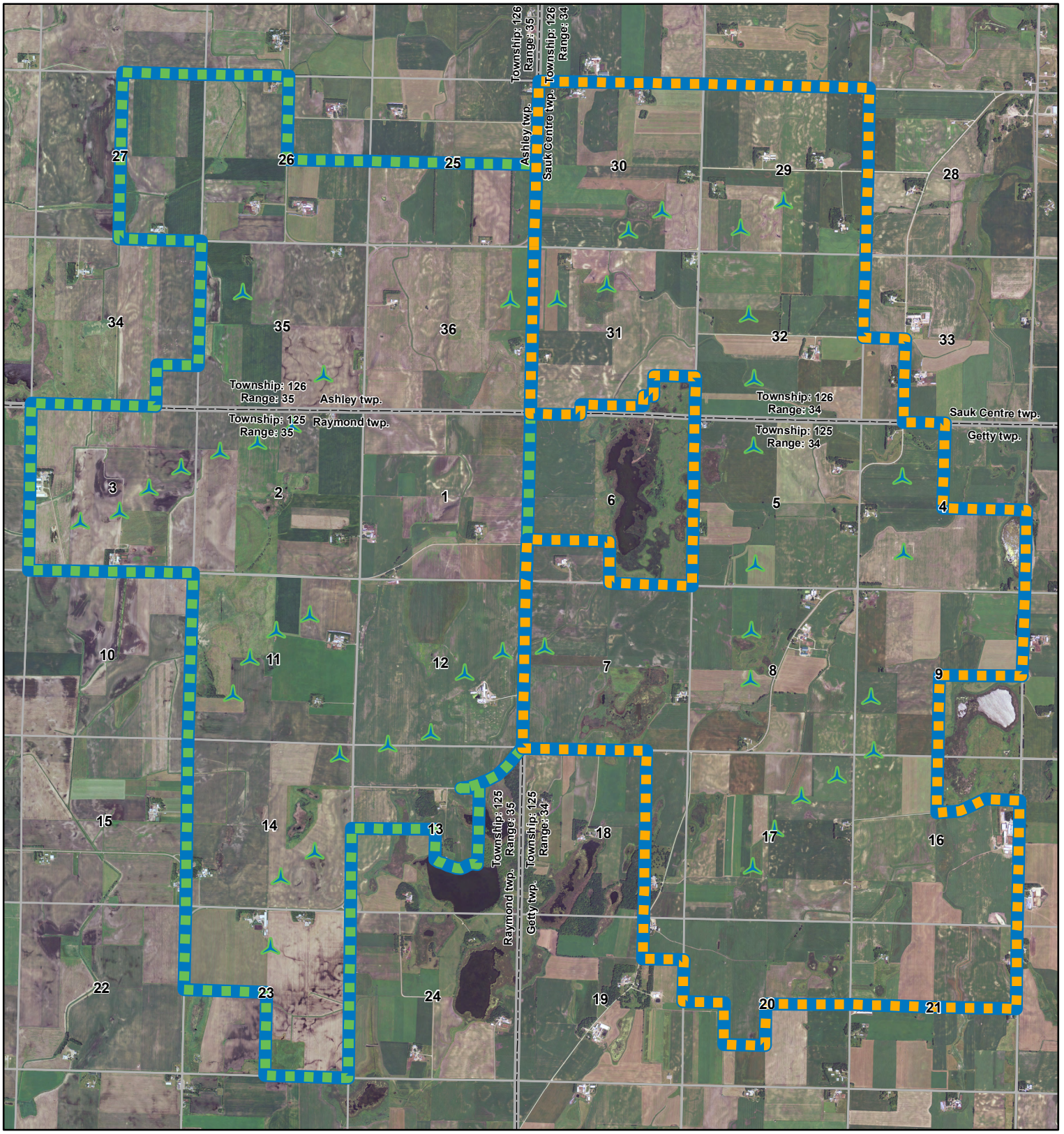
Map Date:
8/23/2011

GERONIMO WIND ENERGY



DG 5/12/2011 Path: O:\GIS\GISData\Projects\Black Oak Wind Farm\Projects\For Christie 08232011\Project Location 08232011.mxd

FIGURE 2 PROPOSED LAYOUT



LEGEND

- Black Oak
- Getty
- Proposed REpower MM100 Turbine Layout

Map Date:
8/23/2011

DATA SOURCES:
GERONIMO WIND ENERGY
USDA/NRCS
ESRI

GERONIMO WIND ENERGY

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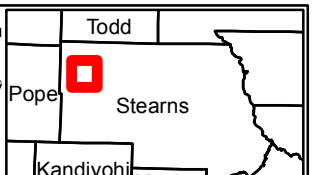
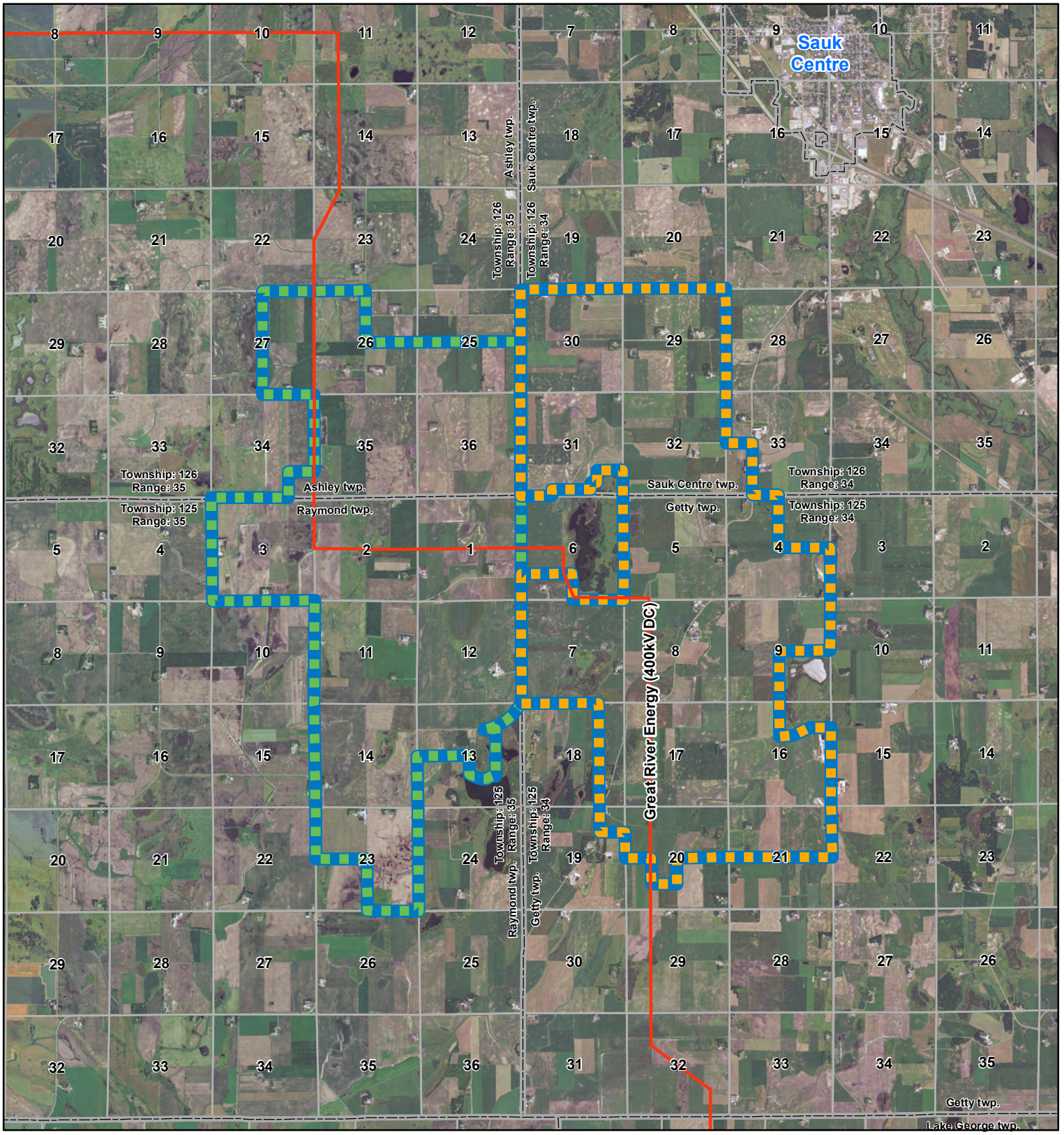
Miles



AREA OF INTEREST

DG 5/12/2011 Path: O:\GIS\GISData\Projects\Black Oak Wind Farm\Projects\For Christie 08232011\Proposed Layout 08232011.mxd

FIGURE 3 EXISTING INFRASTRUCTURE



L E G E N D

Black Oak

Getty

Existing Transmission Lines

Map Date:
8/23/2011

DATA SOURCES:
GERONIMO WIND ENERGY
USDA/NRCS
ESRI

GERONIMO WIND ENERGY

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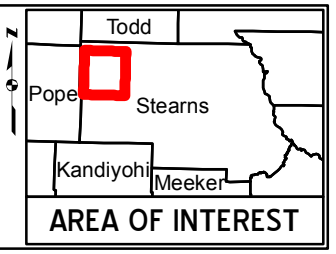
Miles



DG 5/12/2011 Path: O:\GIS\GISData\Projects\Black Oak Wind Farm\Projects\For Christie 08232011\Existing Infrastructure 08232011.mxd

FIGURE 4 SHARED TRANSMISSION

Sauk Centre
Ashley twp.
Sauk Centre twp.
Melrose twp.
Grove twp.
Raymond twp.
Getty twp.
North Fork twp.
Lake George twp.
Township: 126 Range: 35
Township: 126 Range: 34
Township: 126 Range: 33
Township: 125 Range: 35
Township: 125 Range: 34
Township: 125 Range: 33
Township: 124 Range: 34

LEGEND

- Black Oak Substation
- Draft Substation Area
- Draft Shared Transmission
- Black Oak
- Getty

Map Date:
8/23/2011

DATA SOURCES:
GERONIMO WIND ENERGY
USDA/NRCS
ESRI

GERONIMO WIND ENERGY

0 0.5 1 2
Miles

Todd
Pope
Stearns
Kandiyohi
Meeker
AREA OF INTEREST

DG 5/12/2011 Path: O:\GIS\GISData\Projects\Black Oak Wind Farm\Projects\For Christie 08232011\Project TMX 08232011.mxd