

September 2019

Minnesota Public Utilities Commission

Application for Certificate of Need

PUC Docket No. IP7009/CN-19-351

Elk Creek Solar Project

Rock County, Minnesota

Submitted by:

Elk Creek Solar, LLC

7650 Edinborough Way

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Edina, MN 55435



Minnesota Public Utilities Commission Certificate of Need Application for a Solar Energy Conversion System

**Elk Creek Solar, LLC
Rock County, Minnesota
Submitted September 13, 2019
Docket No. IP-7009/CN-19-351**



Elk Creek Solar, LLC
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Project Name: Elk Creek Solar Project

Project Location: The Project's footprint spans approximately 681 acres in Vienna Township in Rock County, Minnesota

Applicant: Elk Creek Solar, LLC, c/o Geronimo Energy, LLC

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 Executive Summary	7
2.0 Introduction.....	7
2.1 The Elk Creek Solar Project	7
2.2 Applicant Information.....	8
2.3 Power Purchase Agreement	8
2.4 Project Contacts	10
2.5 Filing Fees and Payment Schedule (Minn. R. 7849.0219)	10
2.6 Exemption Request	10
3.0 Need Summary and Additional Considerations (Minn. R. 7849.0240).....	11
3.1 Need Summary.....	11
3.2 Additional Considerations	14
3.2.1 Socially Beneficial Uses of Energy Output	14
3.2.2 Promotional Activities Giving Rise to Demand	14
3.2.3 Effects of Facility in Inducing Future Development	15
4.0 Compliance with Certificate of Need Criteria (Minn. R. 7849.0120)	16
4.1 The Probable Result of Denial of Elk Creek’s Application Would be an Adverse Effect on the Adequacy, Reliability, and Efficiency of the Regional Energy Supply (Minn. R. 7849.0120(A)).....	17
4.2 No More Reasonable and Prudent Alternative to the Elk Creek Solar Project has been Demonstrated (Minn. R. 7849.0120(B)).....	18
4.2.1 Size, Type, and Timing	18
4.2.2 Cost Analysis.	19
4.2.3 Potential Environmental and Socioeconomic Impacts.	20
4.2.4 Reliability.....	20
4.3 The Elk Creek Solar Project will Benefit Society in a Manner Compatible with the Natural and Socioeconomic Environments (Minn. R. 7849.0120(C)).....	20
4.3.1 Overall State Energy Needs	20
4.3.2 Potential Environmental and Socioeconomic Impacts Compared to No-Build Alternative	21
4.3.3 Inducing Future Development	22
4.3.4 Socially Beneficial Uses of Output.....	22
4.4 The Elk Creek Solar Project is Consistent with Federal, State, and Local Rules and Policies (Minn. R. 7849.0120(D))	22
4.4.1 The Project is Consistent with Minnesota Energy Policy.....	22
4.4.2 The Project is Consistent with Applicable Minnesota Statutory Provisions.....	23
4.4.2.1 Renewable Preference.....	23
4.4.2.2 Distributed Generation.....	24
4.4.2.3 Innovative Energy Preference.....	24

	4.4.2.4 RES and SES Compliance	25
	4.4.2.5 Environmental Cost Planning	25
	4.4.2.6 Transmission Planning Compliance	25
4.4.3	The Project is Consistent with Federal Energy Policy.....	25
	4.4.3.1 Affordable Clean Energy (“ACE”) Rule	25
	4.4.3.2 Tax Incentives	26
4.4.4	The Project Complies with Federal, State, and Local Environmental Regulation.	26
5.0	Description of Project and Alternatives (Minn. R. 7849.0250).....	27
5.1	Proposed Project	27
	5.1.1 Nominal Generating Capability and Effect of Economies of Scale	30
	5.1.2 Annual Capacity Factor	31
	5.1.3 Fuel	31
	5.1.4 Anticipated Heat Rate	31
	5.1.5 Facility Location	31
5.2	Availability of Alternatives (Minn. R. 7849.0250(B))	32
	5.2.1 Alternatives Considered.....	32
	5.2.1.1 Purchased Power	33
	5.2.1.2 Upgrades to Existing Resources	33
	5.2.1.3 New Transmission	33
	5.2.1.4 Wind Power	33
	5.2.1.5 Hydropower	34
	5.2.1.6 Biomass	34
	5.2.1.7 Emerging Technologies	34
	5.2.1.8 No Facility Alternative (Minn. R. 7849.0340)	35
	5.2.1.9 Facility Information for Alternatives Involving Construction of a LHVTL (Minn. R. 7849.0330).....	36
	5.2.1.10 Combinations	36
	5.2.2 Economic Comparison.....	37
	5.2.3 Alternatives Summary	37
5.3	Discussion of Proposed Facility and Alternatives (Minn. R. 7849.0250(C)).....	38
	5.3.1 Capacity Cost.....	38
	5.3.2 Service Life	38
	5.3.3 Estimated Average Annual Availability	39
	5.3.4 Fuel Costs.....	39
	5.3.5 Variable Operating and Maintenance Costs	39
	5.3.6 Total Cost.....	39
	5.3.7 Estimate of Facility’s Effect on Rates	39
	5.3.8 Efficiency	40
5.4	Map of System (Minn. R. 7849.0250(D)).....	40

6.0	Peak Demand and Annual Consumption Forecast (Minn. R. 7849.0270).....	40
7.0	System Capacity (Minn. R. 7849.0280).....	41
8.0	Conservation Programs (Minn. R. 7849.0290).....	41
9.0	Consequences of Delay (Minn. R. 7849.0300).....	41
10.0	Environmental Information for Proposed Project and Alternatives (Minn. R. 7849.0310)	42
10.1	Visual Impacts	42
10.2	Wildlife	46
11.0	Facility Information for Proposed Project and Alternatives Involving Construction of a LEGF (Minn. R. 7849.0320)	47
11.1	Land Use and Requirements (Minn. R. 7849.0320(A)).....	47
11.2	Traffic (Minn. R. 7849.0320(B))	47
11.3	Information Pertaining to Fossil-Fueled Activities (Minn. R. 7849.0320(C)-(D)).....	49
11.3.1	Fuel	49
11.3.2	Emissions	49
11.4	Water Usage for Alternate Cooling Systems (Minn. R. 7849.0320(E)).....	49
11.5	Water Discharges (Minn. R. 7849.0320(F))	49
11.6	Radioactive Releases and Waste (Minn. R. 7849.0320(G))	50
11.7	Solid Waste (Minn. R. 7849.0320(H)).....	50
11.8	Noise (Minn. R. 7849.0320(I))	50
11.9	Construction and Operation Work Force (Minn. R. 7849.0320(J)).....	51
11.10	Elk Creek will manage the overall Operations and Maintenance of the Project.	51
11.11	Number and Size of Transmission Facilities (Minn. R. 7849.0320(K)).....	51
12.0	Other Filings and Permits	52
12.1	Environmental Report.....	52
12.2	Site Permit.....	52
12.3	Other Project Permits.....	52

List of Appendices:

Appendix A **TRADE SECRET** Project Costs

List of Figures:

Figure 1: Project Location

Figure 2: Land Control and Preliminary Development Areas

Figure 3: Below-Ground Preliminary Project Layout

Figure 4: Above-Ground Preliminary Project Layout

Figure 5: Photograph of Saint John's University Solar Farm, Collegeville, Minnesota

Figure 6: Approximate Tracking Rack System Dimensions

Figure 7: Typical Inverter and Transformer Station

Figure 8: Typical Above-Ground Collection Hanging Bracket

Figure 9: Typical Above-Ground Collection System Components and Configuration.

Tables:

Table 2.4: Certificate of Need Application Schedule of Payments	10
Table 3.1: 25 X '25 Interim Milestones.....	12
Table 5.2.2: Renewable Technology Costs.....	37
Table 10.1 Proximity of Residences to Elk Creek Solar Facility	46
Table 11.2 Annual Average Daily Traffic in the Project Vicinity.....	47
Table 11.3.2 Estimated Avoided Pollutants.....	49
Table 11.8 Inverter and Tracker Noise Levels.....	50
Table 12.3: Project Permits and Approvals	52

ACRONYMS

AADT	Annual Average Daily Traffic
AC	Alternating current
ACE	Affordable Clean Energy
AIMP	Agricultural Impact Mitigation Plan
Applicant or Elk Creek	Elk Creek Solar, LLC
BOP	Balance of Plant
CN	Certificate of Need
Commission	Minnesota Public Utilities Commission
CO ₂	Carbon Dioxide
CPP	Clean Power Plan
CSAH	County State Aid Highway
dBA	The dBA scale is A-weighted decibels
DC	Direct current
DNR	Minnesota Department of Natural Resources
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
Exemption Request	Request for Exemption from Certain Certificate of Need Application Content Requirements
FAA	Federal Aviation Administration
FWS	U.S. Fish and Wildlife Service
Geronimo	Geronimo Energy, LLC
IRPs	Integrated Resource Plans
ITC	Investment Tax Credit
JEDI	Jobs and Economic Development Impacts
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
Land Control Area	The land under a purchase option between the landowner and Elk Creek
LEGF	Large Electric Generating Facility
LEPGP	Large Electric Power Generating Plant
LHVTL	Large High Voltage Transmission Line
MDA	Minnesota Department of Agriculture
Minn. R.	Minnesota Rules

Minn. Stat.	Minnesota Statutes
MISO	Midcontinent Independent System Operator
MNDOT's	Minnesota Department of Transportation's
MPCA	Minnesota Pollution Control Agency
MW	Megawatt Alternating Current (AC)
MWh	Megawatt hour
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
PPA	Power Purchase Agreement
Preliminary Development Area	That portion of the Land Control Area currently anticipated to be occupied by the Project
Project	Elk Creek Solar Farm
PV	Photovoltaic
RECS	Renewable Energy Credits
RES	Renewable Energy Standard
Saint John's Solar Farm	Saint John's University Solar Farm in Collegeville, Minnesota
SCADA	Supervisory Control and Data Acquisition
SES	Solar Energy Standards
SWPPP	Storm Water Pollution Prevention Plan
TWh	Terawatt hours

APPLICATION CONTENT REQUIREMENTS COMPLETENESS CHECKLIST

Minnesota Rule	Required Information	Application Section(s)	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 the applicant, the applicant’s customers, or to the people of Minnesota and neighboring states		
A(1)	Accuracy of the applicant’s forecast	4.1/6.0	Yes
A(2)	Effects of applicant’s existing or expected conservation programs and state and Federal conservation programs	4.1	No
A(3)	Effects of promotional practices on demand	4.1/3.2.2	Yes
A(4)	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	5.2.1.7.5	No
A(5)	Effect of proposed facility in making efficient use of resources	4.1	No
7849.0120	Criteria – A more reasonable and prudent alternative has not been demonstrated		
B(1)	Appropriateness of size, type, and timing	4.2.1	Yes-partial ¹
B(2)	Cost of facility and its energy compared to costs of reasonable alternatives	4.2.2	No
B(3)	Effects of the facility upon natural and socioeconomic environments compared to the effects of reasonable alternatives	4.2.3	No
B(4)	Expected reliability compared to reasonable alternatives	4.2.4	No
7849.0120	Criteria – Facility will provide benefits to society		
C(1)	Relationship of proposed facility to overall state energy needs	4.3.1	No
C(2)	Effects of facility upon the natural and socioeconomic environments compared to the effects of not building the facility	4.3.2	No
C(3)	Effects of facility in inducing future development	4.3.3	No
C(4)	Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	4.3.4	No
D	Facility or suitable modification will not fail to comply with relevant policies, rules, and regulations of other state and Federal agencies and local governments	4.4	No
7849.0210	Filing Fees and Payment Schedule	2.4	No
7849.0240	Need Summary and Additional Considerations		
Subp. 1	Need Summary – summary of major factors justifying need for facility	3.1	No
Subp. 2(A)	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance	3.2.1	No

¹ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
	environmental quality		
Subp. 2(B)	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	3.2.2	Yes ²
Subp. 2(C)	Additional Considerations – Effects of the facility in inducing future development	3.2.3	No
7849.0250	Proposed LEGF and Alternatives Application		
A(1)	Description – Nominal generating capability and effects of economies of scale on facility size and timing	5.1.1	No
A(2)	Description – Anticipated operating cycle, including annual capacity factor	5.1.2	No
A(3)	Description – Type of fuel, reason for selection, projection of availability over life of facility, and alternative fuels	5.1.3	No
A(4)	Description – Anticipated heat rate	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	5.2.1.2	Yes ³
B(3)	Discussion of Alternatives – New transmission lines	5.2.1.3	Yes ⁴
B(4)	Discussion of Alternatives – New generating facilities of a different size and energy resource	5.2.1.4-10	Yes - partial ⁵
B(5)	Discussion of Alternatives – Reasonable combination of alternatives	5.2.1.10	Yes ⁶
C	Proposed Facility and Alternatives	5.3	
C(1)	Capacity cost in current dollars per kilowatt	5.3.1	Yes ⁷
C(2)	Service life	5.3.2	Yes ⁸
C(3)	Estimated average annual availability	5.3.3	Yes ⁹

² The Commission granted an exemption, instead requiring Elk Creek to provide equivalent data from the purchaser of the power.

³ The Commission granted an exemption, instead requiring Elk Creek to provide equivalent data from the purchaser of the power.

⁴ The Commission granted an exemption, instead requiring Elk Creek to provide equivalent data from the purchaser of the power.

⁵ The Commission granted a partial exemption, exempting Elk Creek from discussing any alternative generating facilities using an energy source other than renewable alternatives but requiring Elk Creek to provide an analysis of the availability of alternatively-sized renewable energy projects.

⁶ The Commission granted an exemption, instead requiring Elk Creek to provide equivalent data from the purchaser of the power.

⁷ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

⁸ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
C(4)	Fuel costs in current dollars per kilowatt hour	5.3.5	Yes ¹⁰
C(5)	Variable operating and maintenance costs in current dollars per kilowatt hour	5.3.4	Yes ¹¹
C(6)	Total cost in current dollars of a kilowatt hour provided by it	5.3.6	Yes ¹²
C(7)	Estimate of its effect on rates system-wide and in Minnesota	5.3.7	Yes ¹³
C(8)	Efficiency, expressed for a generating facility as the estimated heat rate	5.3.8	Yes ¹⁴
C(9)	Majoring assumptions made in providing information in subitems (1) to (8), including projected escalation rates for fuel costs and operating and maintenance costs, as well as projected capacity factors	5.3	Yes ¹⁵
D	System Map	5.4	Yes ¹⁶
E	Other relevant information about the facility and alternatives that may be relevant to a determination of need		No
7849.0270	Peak Demand and Annual Consumption Forecast		Yes ¹⁷
Subp. 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
Subp. 2	Content of Forecast	6.0	Yes
Subp. 3	Forecast Methodology	6.0	Yes
Subp. 4	Data Base for Forecasts	6.0	Yes
Subp. 5	Assumptions and Special Information	6.0	Yes
Subp. 6	Coordination of Forecasts with Other Systems	6.0	Yes
7849.0280	System Capacity	7.0	Yes ¹⁸

⁹ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹⁰ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹¹ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹² The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹³ The Commission granted an exemption, instead requiring Elk Creek to provide equivalent data from the purchaser of the power.

¹⁴ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹⁵ The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

¹⁶ The Commission granted an exemption and instead required Elk Creek to provide a map showing the site of the Project and its location relative to the power grid.

¹⁷ The Commission granted an exemption and instead required Elk Creek to provide a general overview of the purchaser’s system and future renewable resource needs.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
7849.0290	Conservation Programs	8.0	Yes
7849.0300	Consequences of Delay	9.0	Yes ¹⁹
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 7849.0320 to 7849.0340	10-11	
7849.0320	Generating Facilities		
A	Estimated range of land requirements, including water storage, cooling systems, and solid waste storage	11.1	No
B	Estimated amount of vehicular, rail, and barge traffic generated by construction and operation of facility	11.2	No
C	Fossil-fuel facilities – Fuel	11.3.1	No
D	Fossil-fuel facilities – Emissions	11.3.2	No
E	Water Use for Alternate Cooling Systems	11.4	No
F	Sources and types of discharges to water	11.5	No
G	Radioactive releases	11.6	No
H	Types and quantities of solid wastes in tons/year	11.7	No
I	Sources and types of audible noise attributable to facility operation	11.8	No
J	Estimated work force required for facility construction and operation	11.9, 11.10	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet for the generating facility	11.12	No
7849.0330	Transmission Facilities	5.2.1.9	Yes
7849.0340	No-Facility Alternative	5.2.1.8	Yes ²⁰

¹⁸ The Commission granted an exemption and instead required Elk Creek to provide a general overview of the purchaser's system and future renewable resource needs.

¹⁹ The Commission granted an exemption and instead required Elk Creek to provide data regarding the consequences of delay to the purchaser's system and future renewable resource needs.

²⁰ The Commission granted an exemption and instead required Elk Creek to provide data regarding the impact of the "no facility" alternative on the purchaser's system and future renewable resource needs.

ELK CREEK SOLAR PROJECT

1.0 EXECUTIVE SUMMARY

Elk Creek Solar, LLC (“Elk Creek” or “Applicant”), a wholly owned subsidiary of Geronimo Energy, LLC (“Geronimo”), a National Grid Company, submits this application for a Certificate of Need (“CN”) to the Minnesota Public Utilities Commission (“Commission”), pursuant to and in accordance with Minn. Stat. § 216B.243 and Minn. R. Ch. 7849. Elk Creek respectfully requests that the Commission issue a CN for the Elk Creek Solar Project (“Project”), a solar energy conversion facility with an up to 80-megawatt (“MW”) alternating current (“AC”) nameplate capacity, in Vienna Township Sections 27, 34, and 35, Township 103, Range 44, Rock County, Minnesota. The Project is a “large energy facility,” as defined in Minn. Stat. § 216B.2421, subdivision 2(1) and a “large electric generating facility” as defined in Minn. R. 7849.0010, subpart 13. Elk Creek will apply for a Site Permit pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. § 216E) and Minn. R. Ch. 7850.

2.0 INTRODUCTION

2.1 THE ELK CREEK SOLAR PROJECT

Elk Creek is an independent power producer that proposes to construct and operate the Project at a site within Vienna Township, Rock County, Minnesota (Figure 1). Elk Creek has obtained leases and purchase options for 976 acres of privately-owned land (the “Land Control Area”). Based on preliminary design, Project facilities will cover approximately 681 acres of the Land Control Area (“Preliminary Development Area”). There are approximately 295 acres of the Land Control Area for which Elk Creek has site control, but are currently not contemplated for occupation by solar facilities (Figure 2). A 295 acre portion of the Land Control Area that will not be utilized by the Project is currently under lease with the underlying landowner and will be excluded from the area leased by Elk Creek during operation of the Project. The underlying landowner can then continue to farm the area released from the lease for the life of the Project. The total nameplate capacity for the proposed Project facilities is up to 80 MW AC. Elk Creek estimated the accredited capacity and the amount of on-peak energy the Project is expected to deliver and provided the information in Appendix A, Section 2.1, which has been designated trade secret. The Project will be comprised of solar modules (panels) and linear axis tracking rack system, inverters, step-up transformers, electrical cables and conduits, electrical cabinets, access roads, a 34.5/161- kilovolt (“kV”) step-up substation with metering and switching gear, security fencing, below-ground or above-ground electrical collection and communication lines, an Operation and Maintenance (“O&M”) facility, parking lot, up to two weather stations (up to 20 feet tall), an 161-kV overhead gen-tie transmission line that will be less than 1,500 feet in length, a Supervisory Control and Data Acquisition (“SCADA”) system, and temporary laydown areas (*see* Figures 3 and 4). The Project will interconnect to the existing ITC 161-kV Magnolia Substation adjacent to the Project. Elk Creek Solar plans to construct the Project on a schedule that facilitates an in-service date in 2021.

The Project falls within the definition of a Large Electric Power Generating Plant (“LEPGP”) in the Power Plant Siting Act and, thus, requires a Site Permit from the Commission prior to construction. Elk Creek submitted a request to the Minnesota Department of Commerce for a size determination on May 14, 2019 in accordance with Minn. Stat. § 216E.021. Elk Creek plans to file a large electric power generating plant site permit application for the Project in Docket No. IP-7009/GS-19-495. Minn. R. Ch. 7850 provides for three different procedures for obtaining a site permit: full review, alternative review, and local review. In accordance with Minnesota Statute 216E.04, Subd. 2(8), Elk Creek is seeking approval of its site permit application under the alternative review process provided for under Minn. Stat. § 216E.04 and Minn. R. 7850.2800-7850.3900.²¹ The Site Permit is the only site approval needed for construction of the Project (Minn. Stat. § 216E.10, subd. 1.).

2.2 APPLICANT INFORMATION

Elk Creek is a wholly owned subsidiary of Geronimo Energy, LLC, a National Grid Company, a utility-scale renewable energy development company headquartered in Edina, Minnesota. Geronimo has developed multiple operating wind farms and solar projects throughout the United States. Over 2,400 MW of wind and solar projects developed by Geronimo are either under construction or operational. Geronimo has a multi-gigawatt development pipeline of wind and solar projects in various stages of development throughout the United States. Geronimo provides custom renewable energy development solutions for utilities, independent power purchasers and corporations looking to harness renewable energy for business growth. With deep roots in agriculture, Geronimo prides itself on developing wind farms and solar facilities that are farmer-friendly, community-driven, and beneficial for rural communities. Neither Geronimo nor Elk Creek own or operate existing renewable energy facilities in Minnesota that were permitted by or otherwise subject to the jurisdiction of the Commission. Approximately 55 MW of community solar garden projects that were developed by Geronimo and other developers as part of Xcel Energy’s Community Solar Garden program were purchased by Nordic Solar, LLC and Phase 2 Nordic Solar, LLC and were then constructed and are operating. Geronimo and Nordic Solar, LLC and Phase 2 Nordic Solar, LLC are partially owned by the same parties. Geronimo is also developing an up to 100 MW AC solar project in Benton County, Minnesota, through its subsidiary, Regal Solar, LLC, an up to 120 MW AC solar project, adjacent to the Elk Creek Project, in Rock County, Minnesota through its subsidiary Elk Creek Solar 2, LLC and an up to 100 MW AC solar project in Morrison County, Minnesota, through its subsidiary, Royal Solar, LLC.

2.3 POWER PURCHASE AGREEMENT

Elk Creek has entered into a power purchase agreement (“PPA”) with Northern States Power Company doing business as Xcel Energy whereby Xcel Energy agreed to purchase up to 80 MW of the energy generated by the Project. Xcel Energy sought and entered into the PPA with Elk Creek in support of Xcel Energy’s Renewable*Connect Program. Xcel Energy submitted a Petition with the Commission on January 7, 2019 for approval to expand their

²¹ See Notification Letter dated July 31, 2019, eDocket ID. No. 2197-154859-01, IP-7009/GS-19-495.

Renewable*Connect Program into a permanent offering and to transition Xcel Energy's Windsource customers to the expanded Renewable*Connect Program's Ongoing Month-to-Month offering.²² The Commission adopted an Order approving the Renewable*Connect program expansion proposal, with certain modifications, on August 12, 2019.²³ Xcel Energy initiated the process of seeking Commission approval of the PPA with Elk Creek by filing the PPA on September 10, 2019 in a separate docket for Commission approval. Therefore, the Commission has not determined the need for the Project or approved the PPA. Accordingly, Elk Creek is proceeding with this application because the Project is not exempt from the CN requirement.

A CN from the Commission is required for all "large energy facilities," defined to include generators greater than 50 MW in size, constructed in Minnesota, unless a statutory exemption applies.²⁴ Elk Creek proposes to construct a solar energy conversion facility of up to 80 MW in Rock County, Minnesota. Therefore, absent an exemption, a CN will be required.

As part of Xcel Energy's Renewable*Connect expansion, Xcel Energy requested to procure new resources to serve prospective participating customers, including an estimated total of 80 MW of new solar generation. As noted above, the Commission approved Xcel Energy's proposed program expansion, with some modifications, and the associated renewable energy sourcing proposal.²⁵ This Application also demonstrates how this Project is needed to meet the Renewable Energy Standard ("RES") and other clean energy requirements in Minnesota and neighboring states in the unlikely event the Commission does not approve the PPA with Xcel Energy. As a non-wind variable generation resource utilizing linear axis solar tracking systems to follow the path of the sun throughout each day, the Project will have a nameplate capacity of up to 80 MW AC. By way of example, 80 MW AC is enough energy to provide electricity for approximately 19,000 homes annually and avoid the emission of approximately 119,000 metric tons of carbon annually.²⁶

Elk Creek requests that the Commission issue a CN for the Project on the basis of a need for economical and carbon-free renewable energy for Xcel Energy's Renewable*Connect customers. This approval will preserve the Project's ability to generate low-cost, carbon-free energy for Xcel Energy's customers and their ratepayers. Elk Creek respectfully requests that the Commission issue a CN for the Project on the basis of a need for economical renewable

²² In the Matter of the Petition of Northern States Power Company for Approval of a Renewable*Connect Program – and – In the Matter of the Petition of Northern States Power Company for Approval of a Renewable Energy Rider, Docket No. E002/M-19-33 (January 7, 2019)

²³ See Order Approving Petition With Modifications, Docket No. E-002/M-19-33 (August 12, 2019).

²⁴ Minn. Stat. §§ 216B.243 and 216B.2421.

²⁵ See Order Approving Petition With Modifications, Docket No. E-002/M-19-33 (August 12, 2019).

²⁶ Based on EPA Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh annual production PVSYS model.

energy writ large even if the Commission does not approve Xcel Energy’s request for approval of the Elk Creek PPA.

2.4 PROJECT CONTACTS

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2.5 FILING FEES AND PAYMENT SCHEDULE (MINN. R. 7849.0219)

The total fee for the CN Application and the schedule for payment are shown in Table 2.4. The fee determination for the Project is based on a capacity of up to 80 MW, per the requirements of Minn. R. 7849.0210, subp. 1. The payment schedule is based on Minn. R. 7849.0210, subp. 2.

Table 2.4: Certificate of Need Application Schedule of Payments

Fee Calculation	Amount
Fee Calculation Equation	\$10,000 + \$50/MW
Due with CN Application	\$3,500.00
Due 45 days after Application submittal date	\$3,500.00
Due 90 days after Application submittal date	\$3,500.00
Due 135 days after Application submittal date	\$3,500.00
Total Calculated Fee	\$14,000.00

2.6 EXEMPTION REQUEST

Minn. R. Ch. 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 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. Minn. R. 7849.0200, subp. 6.

On May 28, 2019 Elk Creek submitted a Request for Exemption from Certain Certificate of Need Application Content Requirements (“Exemption Request”). In its Exemption Request, Elk Creek requested that the Commission grant its exemptions for an up to 80 MW project, pursuant to Minn. Stat. § 216B.243 and Minn. R. 7849.0200, 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 the RES or the Solar Energy Standards (“SES”) requirements set forth in Minn. Stat. § 216B.1691, or other clean energy standards.

On August 19, 2019, the Commission issued an order granting Elk Creek the exemptions it requested in its Exemption Request, as modified by the comments filed by the Department of Commerce, Division of Energy Resources.²⁷ Where appropriate in this Application, Elk Creek will reference the specific exemptions granted by the Commission.

3.0 NEED SUMMARY AND ADDITIONAL CONSIDERATIONS (MINN. R. 7849.0240)

3.1 NEED SUMMARY

On January 7, 2019 Xcel Energy submitted a Petition with the Commission for approval to expand their Renewable*Connect Program.²⁸ The Commission adopted an Order approving the Renewable*Connect program expansion proposal, and their renewable energy sourcing proposal, with certain modifications, on August 12, 2019.²⁹ Xcel Energy initiated the process of seeking Commission approval of the PPA with Elk Creek by filing the PPA on September 10, 2019 in a separate docket for Commission approval.³⁰ Elk Creek and Xcel Energy entered into a 20-year PPA for the purchase and sale of all power generated by the Project. The proposed Project would install up to 80 MW of solar generating capacity in Minnesota that would contribute to satisfying Xcel Energy's and its consumers' demands for renewable energy. Xcel Energy initiated the process of seeking Commission approval of the PPA with Elk Creek. As a non-wind variable generation resource utilizing linear axis solar tracking systems to follow the path of the sun throughout each day, the Project will have a nameplate capacity of up to 80 MW AC. By way of example, the Project will produce enough energy to provide electricity for approximately 19,000 homes annually and avoid the emission of approximately 119,000 metric tons of carbon annually.³¹

Electricity is one of the largest uses of energy in the United States, and the U.S. Energy Information Administration ("EIA") estimates that U.S. electricity consumption will continue to grow from 2018 to 2050.³² If the Commission decides not to approve the PPA, the demand for

²⁷ Order (August 19, 2019) (eDocket No. 20198-155289-01).

²⁸ *In the Matter of the Petition of Northern States Power Company for Approval of a Renewable*Connect Program* – and – *In the Matter of the Petition of Northern States Power Company for Approval of a Renewable Energy Rider*, Docket No. E002/M-19-33 (January 7, 2019)

²⁹ See Order Approving Petition With Modifications, Docket No. E-002/M-19-33 (August 12, 2019).

³⁰ Xcel Energy, Petition (Initial Filing) *In the Matter of the Petition of Northern States Power Company for Approval of Solar Energy Purchase Agreement with Elk Creek Solar, LLC for 80 MW Solar Generation*, Docket No. E002/M-19-568 (September 11, 2019)

³¹ Based on EPA Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh annual production PVSYST model.

³² U.S. Energy Information Administration, *Annual Energy Outlook 2019* (January 2019), at 28, 90. Accessed online August 30, 2019. Retrieved from <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

renewable electricity is still great enough to support a need for the Project. For example, eleven of the Midcontinent Independent System Operator (“MISO”) states, including Minnesota, currently have either mandated or voluntary renewable portfolio standards or policies.³³ As shown on Table 3.1, the Legislature also established interim milestones to ensure that utilities make progress towards the “25 by ’25” requirement. Utilities are also required, in addition to the “25 by ’25” requirement, to provide 1.5 percent of their total retail electrical sales from electricity generated by solar energy by 2020.³⁴ The legislature further decided it is the energy goal of the state of Minnesota that, by 2030, ten percent of the retail electric sales in Minnesota are generated by solar energy.³⁵ In addition, the Minnesota legislature has considered, but has not passed, legislation on multiple occasions in recent legislative sessions to increase Minnesota’s renewable energy requirements requiring utilities to obtain additional electricity from renewable sources beyond that which is required by the current RES, and to further reduce carbon from energy sources.³⁶ Accordingly, utilities will likely be preparing for requirements to reduce carbon from energy sources and an increase to the RES by seeking additional renewable energy generation sources above and beyond that which is currently required by the RES.

Table 3.1: 25 X ‘25 Interim Milestones

Year	Non-Nuclear Utility Requirement	Xcel Energy Requirement
2020	20%	30% (25% from wind)
2025	25%	30% (25% from wind)

Moreover, Minnesota is proximate to other jurisdictions that also have renewable policies. For example, the North Dakota Legislature enacted a statutory provision adopting the national “25x’25” initiative, which establishes a goal of having not less than 25 percent of the total energy consumed within the United States come from renewable resources by January 1, 2025.³⁷ Additional renewable resources will be needed to meet the 25x’25 initiative.

³³ *MTEP18 MISO Transmission Enhancement Plan*, at 182. Accessed online August 30, 2019. Retrieved from <https://cdn.misoenergy.org/MTEP18%20Full%20Report264900.pdf>.

³⁴ Minn. Stat. § 216B.1691, subd. 2f (a)

³⁵ Minn. Stat. § 216B.1691, subd. 2f (e)

³⁶ See E.g., Legislation would boost Standard for Renewable Energy, Mike Hughlett, Star Tribune (February 27, 2017), legislature considered bill to increase RES to 50% (<http://www.startribune.com/legislation-would-boost-standard-for-renewable-energy/414886624/>) introduced at H.F. No. 1772 on February 27, 2017; and Renewable Energy Developers Stand Ready to Help Minnesota Achieve New Clean Energy Milestones, Clean Grid Alliance (February 5, 2019), legislation proposed to increase RES to 85 percent by 2035 and establishes a 100 percent carbon-free standard by 2050 (<https://cleangridalliance.org/press/48/renewable-energy-developers-stand-ready-to-help-minnesota-achieve-new-clean-energy-milestones>); introduced as H. F. No. 1671 on February 25, 2019. See also the Clean Energy Act First introduced as H. F. No. 1956 on March 4, 2019.

³⁷ NDCC § 17-01-01.

Under current state standards, total United States renewable portfolio standard demand will increase from 290 terawatt hours (“TWh”) in 2018 to 540 TWh in 2030.³⁸ Given existing renewable energy capacity, an additional 180 TWh increase in renewable resources will be required to meet demand through 2030.³⁹ In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.⁴⁰ Although the current Production Tax Credit and Investment Tax Credit for renewables are set to begin a phasedown in upcoming years, many utilities in MISO are developing long-term resource plans, which include increased levels of renewable energy such as solar.⁴¹ Recent solar pricing has shown that the costs of energy and capacity of utility scale solar are on par with building a simple cycle CT to provide peaking power.⁴² Xcel Energy has recently expressed goals to reduce carbon emissions by 80% from 2005 levels and to provide 100% carbon free electricity by 2050.⁴³ In order to accomplish these goals, Xcel Energy anticipates, in part, adding thousands of megawatts of wind and solar power to its system.⁴⁴ The Project will be an important contributor to Xcel Energy achieving its carbon reduction goals.

In addition to traditional utility demand for solar energy, a growing number of corporations are turning to renewable energy to save money on energy and meet sustainability goals. Corporate customers either purchase renewable energy directly or obtain renewable benefits and cost savings through financially settled contracts, sometimes called virtual PPAs. Over 6,530 MW of renewable energy was purchased by non-utilities by the end of 2018.⁴⁵ That compares to 2,780 MW procured by non-utilities in 2017 and approximately 1,730 MW in 2016. Further, corporations such as Apple, Google, and Facebook along with many others, have set goals to obtain 100 percent of their energy from renewables.⁴⁶ Given this demand for renewable energy, a market exists for independently produced electricity generated from solar and other renewables, including the up to 80 MW to be generated by the Project.

³⁸ Lawrence Berkeley National Laboratory, *U.S. Renewable Portfolio Standards 2018 Annual Status Report* (November 2018), at 20. Accessed online August 29, 2019. Retrieved from http://eta-publications.lbl.gov/sites/default/files/2018_annual_rps_summary_report.pdf

³⁹ *Id.* at 21.

⁴⁰ *MTEP18 MISO Transmission Enhancement Plan*, at 42.

⁴¹ *MTEP18 MISO Transmission Enhancement Plan*, at 144.

⁴² Lazard’s Levelized Cost of Energy Analysis 10.0, 2016.

⁴³ Xcel Energy, *Carbon Report 2019* (February 2019). Accessed online August 30, 2019. Retrieved from <https://www.xcelenergy.com/staticfiles/xcel/PDF/Xcel%20Energy%20Carbon%20Report%20-%20Feb%202019.pdf>.

⁴⁴ *Id.* at 5.

⁴⁵ Business Renewables Center. (2018). *Corporate Renewable Deals 2013-2018 YTD Chart*. Accessed online August 30, 2019. Retrieved from <http://businessrenewables.org/corporate-transactions>.

⁴⁶ See <http://there100.org/companies>.

3.2 ADDITIONAL CONSIDERATIONS

3.2.1 Socially Beneficial Uses of Energy Output

Energy produced by the Project will provide significant, numerous, and varied societal benefits. First, the Project will provide a large amount of renewable energy with minimal environmental impact as well as avoided environmental costs, as discussed in Sections 10 and 11 in this Application. Further, regional and national security and energy reliability can be enhanced through the development of diversified generation resources such as solar energy generation such as the Project. The Project could also assist Xcel Energy in either replacing older coal plants with renewable energy or avoiding construction of a new natural gas peaking plant, thereby reducing carbon dioxide emissions.⁴⁷

The Project is also designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by a combination of voluntary lease agreements and purchase options between landowners and Elk Creek for Elk Creek. Elk Creek has entered into leases or purchase options with the landowners that own the land on which the Project would be constructed. Elk Creek will lease and/ or own the land on which the Project will be constructed after the Site Permit is issued and prior to the start of construction. The Project will also create new local job opportunities for various trade professionals that live and work in the area as it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

The Project offers an opportunity to maximize the economic attributes that benefit the local community and deliver an overall cost-competitive energy project. The Project's strong solar resource, proximity to existing electrical and transportation infrastructure, and ability to create a construction-efficient layout are some of the major benefits of the Project.

3.2.2 Promotional Activities Giving Rise to Demand

Elk Creek was granted an exemption from Minn. R. 7849.0240, subp. 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." Elk Creek has not engaged in promotional activities which could have given rise to the need for the electricity to be generated by the Project. Thus, consistent with its determinations in past CN proceedings, the Commission granted an exemption to Elk Creek.

⁴⁷ NREL (August 2007), Energy, Economic and Environmental benefits of the Solar America Initiative, at 4 (stating that PV installations can help provide electricity during peak demand periods, thereby decreasing the need for constructing new natural gas peaking plants) and at 21 (stating that electricity generation (in 2007) was the largest industrial source of air emissions in the United States and the emissions from solar energy generation, that replaces fossil fuel sources of energy, are negligible).

3.2.3 Effects of Facility in Inducing Future Development

The Project is not expected to directly affect development in Rock County. The Project is located 1.5 miles north of Magnolia and 4.5 miles northeast of Luverne. Residences are scattered throughout the rural area where the land use is dominated by agricultural fields, predominately corn planted in row crops. With the exception of County State Aid Highway (“CSAH”) 3, which forms the eastern boundary of the Project, roads that surround the Land Control Area are local county or township roads. The Land Control Area is bordered on the north by 151st Street, bordered on the south by 131st Street and bisected by 141st Street. Similarly, the Land Control Area is bordered by 180th Avenue on the west, CSAH 3 on the east, and bisected by 190th Avenue.

Based on the 2010 U.S. Census, the population of Rock County is 9,687 persons, which represents less than 1 percent of the total population of Minnesota. The 2010 U.S. Census also noted that Vienna Township has a population density of 4.3 persons per square mile of land area. According to the U.S. Census Bureau 2013-2017 American Community Survey 5-year Estimates, approximately 344 vacant housing units exist in Rock County. In the nearest metropolitan area, Sioux Falls, South Dakota, there are approximately 4,576 vacant housing units (U.S. Census Bureau, 2017). The Project is not expected to hinder future development that can otherwise occur in surrounding agricultural areas.

The Project is designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary leases or purchase agreement between the landowner and Elk Creek for Elk Creek’s lease or purchase of the land. Solar energy infrastructure will also provide an additional source of revenue to the county and townships in which the Project is sited. For instance, the Project is estimated to provide annual production tax revenues to Rock County of approximately \$144,000 annually over 25 years. Additionally, Vienna Township will receive approximately \$36,000 annually over 25 years.

Elk Creek will also establish the Elk Creek Education Fund, to which Elk Creek will contribute \$16,000 annually for the first 20 years of Project operation. Because the Project is located within the Luverne school district, the fund will be distributed to this district. Elk Creek will continue to coordinate with the school district on establishing the fund as the Project develops.

The Project will create new local job opportunities for various trade professionals that live and work in the area and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. The Project is anticipated to generate up to 100 construction and related service jobs during the peak of construction activities and approximately four full-time permanent operations jobs. Elk Creek and Xcel Energy have agreed to a provision in the PPA that allows Elk Creek to receive the Energy Payment Rate (as defined in the PPA) if Elk Creek provides written confirmation upon Commercial Operation that it used exclusively union labor to construct and

commence operations.⁴⁸ General skilled labor is expected to be available in Rock County or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states because the relatively short construction duration often precludes special training of local or regional labor. Because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code, much of the workforce needed to construct a solar facility must be comprised of Minnesota licensed electricians.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for housing, lodging, food services, fuel, transportation and general supplies. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes. At the same time the Project is providing income to local residents, it will also help make the energy those residents may rely upon less susceptible to volatility.⁴⁹ The development of solar energy technology now makes solar power's relative price competitive with other generators, including natural gas and coal.⁵⁰

On June 19, 2019, the Rock County Board of Commissioners submitted a comment letter in support of the Project. The Board of Commissioners stated that the Project, represents cost effective renewable energy generation and would bring significant economic development in the county, contribute to tax revenues at the county and township level, benefit local school districts through the Elk Creek Education Fund, and increase employment opportunities.

4.0 COMPLIANCE WITH CERTIFICATE OF NEED CRITERIA (MINN. R. 7849.0120)

The Commission has established criteria to assess the need for an LEGF in Minn. R. 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;

⁴⁸ Xcel Energy, Petition (Initial Filing) *In the Matter of the Petition of Northern States Power Company for Approval of Solar Energy Purchase Agreement with Elk Creek Solar, LLC for 80 MW Solar Generation*, Docket No. E002/M-19-568 (September 11, 2019), at 7 and Attachment C. Elk Creek notes that the PPA provides that Elk Creek shall not be required to use union labor where after its best efforts, it is unable to engage certain trades to complete the work in sufficient time to meet the COD.

⁴⁹ U.S. Dept. of Energy, *The Use of Solar and Wind as a Physical Hedge against Price Variability within a Generation Portfolio*, at 35 (August 2013) (stating that "Solar and wind generation significantly reduces the exposure of electricity costs to natural gas price uncertainty in fossil-based generation portfolios on a multi-year to multi-decade time horizon.").

⁵⁰ NREL, *2017 Standard Scenarios Report: A U.S. Electricity Sector Outlook*, at 19 (October 2017); U.S. Energy Information Administration, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2016*, at Tables 1a, 1b, (August 2016) available at http://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

B. (A) more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record;

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; 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.

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

4.1 THE PROBABLE RESULT OF DENIAL OF ELK CREEK'S 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 80 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. Elk Creek has negotiated a PPA with Xcel Energy for 80 MW of the energy generated by the Project and, if necessary due to unforeseen circumstances, including Commission denial of Xcel Energy's request for approval of the Elk Creek PPA, will offer the Project's output for sale on the wholesale market. Denying the CN would result in the loss of a significant amount of electricity needed to satisfy state and regional demand and would deny Xcel Energy and its customers the opportunity to purchase clean, low-cost energy.

As discussed in Section 3.1, there is a significant body of state legislative policy requiring utilities to obtain a certain percentage of their total energy resources from renewable energy, which supports the need for reliable, efficient renewable resources, like the solar energy produced by the Project.

The Project has no air emissions and extremely low environmental impacts. It will displace pollutants emitted by fossil fuel-fired generating resources, including carbon dioxide, which is considered a significant contributor to climate change. It will meet the needs of many of Xcel Energy electric consumers at a competitive cost and assist the Xcel Energy in meeting its renewable energy requirements and carbon reduction goals while enhancing the economic base in Rock County.

In addition to the specific need for renewable energy to serve Xcel Energy, many other states in the region have similar renewable energy requirements. For example, Illinois requires

certain utilities to obtain 25 percent of eligible sales from renewables by 2025.⁵¹ Similarly, North Dakota has adopted the national “25 by ‘25” initiative, which establishes a goal of having not less than 25 percent of total energy consumed within the United States come from renewable resources by January 1, 2025.⁵² Under current state standards, total United States renewable portfolio standard demand will increase from 290 TWh in 2018 to 540 TWh in 2030.⁵³ Given existing renewable energy capacity, an additional 180 TWh increase in renewable resources will be required to meet demand through 2030.⁵⁴ In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.⁵⁵ Based on this data, there is a need for more solar power to adequately, reliably, and efficiently meet the region’s need for renewable energy than is currently available.

4.2 NO MORE REASONABLE AND PRUDENT ALTERNATIVE TO THE ELK CREEK SOLAR PROJECT HAS BEEN DEMONSTRATED (MINN. R. 7849.0120(B))

Minn. R. 7849.0120(B) requires a CN applicant 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 Minn. R. 7849.0120(B), the Project has many advantages when compared to other renewable alternatives.

4.2.1 Size, Type, and Timing.

When 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 renewable energy 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 the Project. Moreover, in the January 2017 IRP Order, the Commission determined that Xcel Energy had a need to purchase at least 650 MW of solar generation by 2021.

Regarding the type of facility, the Commission granted Elk Creek an exemption from Minn. R. 7849.0250(B) with respect to evaluating non-renewable alternatives because such alternatives do not meet the Project’s objective of providing energy that will satisfy the RES and other clean energy standards.

⁵¹ 20 Ill. Comp. Stat. sec. 3855/1-75(c)(1).

⁵² See N.D. Cent. Code. § 17-01-01.

⁵³ Lawrence Berkeley National Laboratory, *U.S. Renewable Portfolio Standards 2018 Annual Status Report* (November 2018), at 20. Accessed online August 30, 2019. Retrieved from http://eta-publications.lbl.gov/sites/default/files/2018_annual_rps_summary_report.pdf.

⁵⁴ *Id.* at 21.

⁵⁵ *MTEP18 MISO Transmission Enhancement Plan*, at 42.

Xcel Energy began offering the Renewable*Connect pilot in 2017 consistent with Minn. Stat. § 216B.169, the Renewable and High-Efficiency Rate Options statute, and in order to meet customer demand for a voluntary green tariff. As of August 2019, there were over 2,300 customers on the waiting list. As part of the proposed Renewable*Connect expansion filed with the Commission, Xcel Energy requested to procure new resources to serve their prospective participating customers, including an estimated total of 80 MW of new solar generation.⁵⁶ Xcel Energy evaluated the renewable energy options available to provide the 80 MW of energy generation it needs for its Renewable*Connect Program. At that time, Xcel Energy determined a program goal was to diversify its renewable offerings to its customers with solar power.⁵⁷ Accordingly, Xcel Energy only evaluated solar energy proposals during its acquisition process.

With respect to timing, the Project is expected to be on-line and operational by the end of 2021, depending on completion of regulatory approvals, approval of the Elk Creek PPA, and the MISO interconnection process. This will help Minnesota and Xcel Energy achieve the necessary renewable energy levels required to meet pending clean energy standards milestones and Xcel Energy's customer's needs.⁵⁸

4.2.2 Cost Analysis.

Elk Creek secured a PPA with Xcel Energy for the sale of the energy to be produced by the Project at an attractive price and with attractive terms. Xcel Energy selected the Project after conducting a targeted solicitation and contract negotiation process.⁵⁹ Several potential bids of varying size, pricing, location, and COD options from different sellers were excluded by Xcel Energy. All solar bids received and considered by Xcel Energy produced prices substantially below previous Upper Midwest solicitations with Elk Creek providing the most favorable price of all potential solar project providing bids to Xcel Energy.⁶⁰ As an independent power producer, the risk of otherwise not selling the Project's output, and the risk of construction and operational cost overruns, lies entirely with Elk Creek, and not with the State of Minnesota or ratepayers. The Project will also generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass.⁶¹ Even though the Solar Investment Tax Credits ("ITC") phase down over the next several years, solar

⁵⁶ Xcel Energy, Petition (Initial Filing) *In the Matter of the Petition of Northern States Power Company for Approval of Solar Energy Purchase Agreement with Elk Creek Solar, LLC for 80 MW Solar Generation*, Docket No. E002/M-19-568 (September 11, 2019), at 5.

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ See Energy Information Agency, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2019*, https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.⁶²

4.2.3 Potential Environmental and Socioeconomic Impacts.

The purpose of this analysis is to compare the potential impacts of various renewable generation options. As demonstrated in Sections 10 and 11 of this Application, the environmental impacts of the Project will be minimal and significantly less than a fossil-fuel based facility. One of the greatest attributes of solar 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 be sited so as to minimize environmental impacts. Additionally, recent research on the environmental impacts of solar farms indicates that there could be some net benefits to soil resources over the lifecycle of the Project.⁶³ At the same time, the socioeconomic benefits of a utility-scale solar power project are considerable, as described in Section 4.3 below.

4.2.4 Reliability.

The Project will be available at least 98 percent of the time, consistent with other utility-scale solar projects.

4.3 THE ELK CREEK SOLAR PROJECT WILL BENEFIT SOCIETY IN A MANNER COMPATIBLE WITH THE NATURAL AND SOCIOECONOMIC ENVIRONMENTS (MINN. R. 7849.0120(C))

Minn. R. 7849.0120(C) requires a CN applicant 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 Minn. R. 7849.0120(C), the energy produced by the Project will provide significant, numerous, and varied societal benefits, with minimal negative impacts.

4.3.1 Overall State Energy Needs

As discussed in Section 3.1 above, utilities continue to require renewable energy to meet the RES, SES and other clean energy and greenhouse gas reduction standards, as well as to meet consumers' energy demands. Moreover, Xcel Energy's customers have requested access to more renewable energy to satisfy their corporate, financial, lifestyle, or other goals. As of August 2019, there were over 2,300 customers on the waiting list for Xcel Energy's Renewable*Connect

⁶² See Energy Information Agency, *Annual Energy Outlook 2019* (January 2019), at 22, <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

⁶³ See J. S. Briberg, J.S. "Utility & Community Solar Should Use Native Landscaping" Clean Technica blog. Available online at: <https://cleantechnica.com/2016/03/15/utility-and-community-solar-should-use-native-landscaping/>. Accessed August 2019.

Program.⁶⁴ The Commission adopted an Order approving the expansion of Xcel Energy's Renewable*Connect Program on August 12, 2019.⁶⁵

4.3.2 Potential Environmental and Socioeconomic Impacts Compared to No-Build Alternative

In general, the socioeconomic impacts associated with the Project will be positive. Wages will be paid, and expenditures will be made to local businesses and landowners during the Project's construction and operation. The construction and operation of the Project will increase Rock County's tax base. In addition, lease and purchase payments to landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project will impact approximately 670 acres of agricultural land within the Preliminary Development Area and will not result in a significant impact to land-based economies in the Project vicinity. Of the 309,120 acres in Rock County, approximately 90 percent (approximately 280,537 acres) are classified as agricultural land. Impacts to 670 acres of agricultural land within the solar facility would reduce the amount of agricultural land in the County by less than one quarter of one percent. Agricultural production would be allowed to continue in the area outside of the fence line of the solar facility during construction and operation of the Project. There is no indication that any minority or low-income population is concentrated in any one area of the Project.

One of the greatest attributes of solar 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 be sited so as to minimize environmental impacts.

The development of solar energy has recently become and will continue to be important in diversifying and strengthening the economic base of Minnesota. Local contractors and suppliers will be used for portions of construction when practicable. Much of the workforce needed to construct a solar facility must be comprised of Minnesota licensed electricians because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code, which requires Minnesota licensed electricians to complete. Wages and salaries paid to contractors and workers in Rock 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 be circulated and recirculated within the county and the state. Expenditures made by the Applicant for equipment, fuel, operating supplies, and other products and services will benefit businesses in the county and the state. In addition, lease and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of

⁶⁴ Xcel Energy, Petition (Initial Filing) *In the Matter of the Petition of Northern States Power Company for Approval of Solar Energy Purchase Agreement with Elk Creek Solar, LLC for 80 MW Solar Generation*, Docket No. E002/M-19-568 (September 11, 2019), at 5.

⁶⁵ See, Order Approving Petition with Modifications, Docket No. E-002 / M-19-33 (August 12, 2019).

their land from agricultural production, 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 example, the Project will pay a Production Tax to the local units of government of \$1.20 per MWh of electricity produced, resulting in an annual Production Tax of approximately \$180,000 annually or approximately 4.5 million over 25 years. In addition, the property on which the Project will be sited will be reclassified from agricultural land to commercial land, which has a higher tax rate than agricultural land and therefore will result in higher real estate taxes being paid to the county than before the Project was constructed.

Not building an electrical generation facility would result in no physical impact to the environment in Rock County. However, not building the Project would also not provide an additional source of tax revenues to the county, an increase in the income stream to residences and businesses, 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 a minimal impact on the physical environment, while simultaneously providing significant benefits.

4.3.3 Inducing Future Development

Although the Project is not expected to directly affect development in Rock County, the Project will provide significant benefits to the local economy and local landowners. Landowners in the Project area will benefit from the lease and purchase payments, and installation of solar energy infrastructure will increase the local tax base in the county and township 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 O&M positions. Elk Creek will also establish the Elk Creek Education Fund, to which Elk Creek will contribute \$16,000 annually for the first 20 years of Project operation. Because the Project is located within the Luverne school district, the fund will be distributed to this district. Elk Creek will continue to coordinate with the school district on establishing the fund as the Project develops.

4.3.4 Socially Beneficial Uses of Output

The Project will produce affordable, clean, renewable energy that will help meet energy demands for Xcel Energy's customers and the RES, the SES and other clean energy and carbon reduction standards. By way of example, it will produce enough energy to meet the energy needs for approximately 19,000 homes annually. In addition, the local economy will benefit from the landowner lease and purchase payment for the Project, production taxes, income from jobs created, and local spending. It will also provide carbon-free energy that will assist in meeting Xcel Energy's and Minnesota's carbon and greenhouse gas reduction goals.

4.4 THE ELK CREEK SOLAR 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

Xcel Energy's acquisition of the power generated by the Project will allow Xcel Energy to reduce CO₂ emissions and diversify both the location and type of its energy supply and to provide needed renewable power for Xcel Energy's customers. The Project will provide a significant amount of renewable energy, which is consistent with Minnesota's policy to increase renewable energy use. Solar, as renewable energy, is a favored energy resource under Minnesota law.⁶⁶ In addition, as discussed previously, the SES mandates increased electric generation from solar resources.⁶⁷ The state has also set a goal to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 30 percent below 2005 levels by 2025 and to a level at least 80 percent below 2005 levels by 2050.⁶⁸ Adding new sources of electric energy with no emissions, like solar energy, is essential to meeting these goals.

Further support for the conclusion that the Project is consistent with state energy policy can be found in the favorable tax treatment that solar energy facilities receive. The state legislature has exempted all real and personal property of solar energy conversion systems from property taxes.⁶⁹ Solar energy conversion systems are also exempt from state sales tax.⁷⁰

4.4.2 The Project is Consistent with Applicable Minnesota Statutory Provisions

In addition to the criteria set forth in Minn. R. Ch. 7849, there are a number of statutory provisions that may apply to a CN application. As discussed below, the Project is consistent with these statutory requirements.

4.4.2.1 Renewable Preference

Minn. Stat. § 216B.243, subd. 3a provides a preference for renewable resources:

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

⁶⁶ See Minn. Stat. § 216B.243, subd. 3a ("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.")

⁶⁷ Minn. Stat. § 216B.1691, sub. 2f.

⁶⁸ Minn. Stat. § 216H.02.

⁶⁹ Minn. Stat. § 272.02, subd. 24.

⁷⁰ Minn. Stat. § 297A.67, subd. 29.

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.

Minn. Stat. § 216B.2422, subd. 4, is also applicable:

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 energy and satisfies these statutory criteria by furthering available resources to meet this renewable energy preference.

4.4.2.2 Distributed Generation

Minn. Stat. § 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 Minn. Stat. § 216B.169, subd. 1(c), "distributed generation" references projects of no more than 10 MW. Elk Creek is a utility-scale Project and will not provide distributed energy to the system as defined in Minnesota Law. However, Elk Creek believes that the need for new energy resources is so great that it also will not displace any opportunities for installation of renewable energy. Additionally, the Project's transmission opportunities and economies of scale make it an exceptional electric resource that will provide great benefits to the state and the local economy.

4.4.2.3 Innovative Energy Preference

Minnesota also requires the Commission to consider an innovative energy project⁷¹ before authorizing construction or expansion of a fossil-fueled generation facility. Minn. Stat. § 216B.1694, subd. 2(a)(4). Because the Project is not a fossil-fuel facility, this requirement is not applicable.

⁷¹ An "innovative energy project" is defined as a coal-burning facility employing innovative technology and located on the Iron Range. Minn. Stat. § 216B.1694, subd. 1.

4.4.2.4 RES and SES Compliance

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to evaluate whether a CN applicant is in compliance with Minnesota’s RES and SES. Elk Creek, however, is not subject to the RES or SES because it has 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 Xcel Energy, which must meet the RES and SES requirements, provided that Xcel Energy will not use the energy generated by the Project to satisfy the SES or RES because Xcel Energy is currently in compliance with the RES and SES.

4.4.2.5 Environmental Cost Planning

Minn. Stat. § 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 Department of Commerce have determined, this statute does not apply to renewable generation facilities such as the Project.⁷²

4.4.2.6 Transmission Planning Compliance

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to consider whether a utility seeking a CN is in compliance with certain transmission planning requirements. As an independent power producer, this statute does not apply to Elk Creek.

4.4.3 The Project is Consistent with Federal Energy Policy

4.4.3.1 Affordable Clean Energy (“ACE”) Rule

On June 17, 2019, the Environmental Protection Agency finalized the Affordable Clean Energy rule. The rule replaces the 2015 Clean Power Plan (“CPP”) rule, which was intended to cut carbon dioxide emissions from existing power plants by 32% from 2005 levels. The ACE rule focuses only on carbon reduction through increasing the efficiency (reducing the heat rate) of fossil fuels as they generate electricity. While some have argued that the ACE rule is unlikely to result in large reductions of CO₂, many utilities and organizations continue on a path to reduce carbon emissions in their energy use. For example, Xcel Energy’s recently filed Upper Midwest Integrated Resource Plan (2020-2034) is designed reduce carbon emissions 80% below 2005 emissions by 2030, and attain 100% carbon-free energy by 2050.⁷³ Minnesota has also pledged to move forward with preparations to achieve carbon reductions consistent with the former CPP.⁷⁴ Accordingly, the Minnesota Pollution Control Agency (“MPCA”) is currently reviewing the CPP and assessing potential pathways for compliance. MPCA states that the Minnesota state

⁷² *Elm Creek*, Docket No. IP6631/CN-07-789, Commission Order Granting Certificate of Need (Jan. 15, 2008), at 12.

⁷³ Xcel Energy, 2020-2034 Upper Midwest Integrated Resource Plan (Initial Filing, *In the Matter of Xcel Energy’s 2020-2034 Upper Midwest Integrated Resource Plan*, Docket ID. E-002/RP-19-368 (May 30, 2019)

⁷⁴ *E.g.*, <https://www.pca.state.mn.us/air/what-mpca-doing>

plan “will need to consider current and new electricity production and pollution control policies in order to achieve necessary carbon pollution reductions while supporting reliable, affordable power for all Minnesotans.”⁷⁵

4.4.3.2 Tax Incentives

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

The solar ITC provided by Section 48 of the Internal Revenue Code permits qualifying entities to elect to claim a credit of 30 percent of qualifying costs for a project that has begun construction through 2019, with a step down of the credits through 2021. In December 2015, the Consolidated Appropriations Act extended the expiration date for the ITC for solar facilities to December 31, 2019. As modified, Section 48 phases down the ITC for solar energy property the construction of which begins after December 31, 2019, and before January 1, 2022.

Elk Creek expects to utilize the ITC as part of the Project’s long-term financing structure and anticipates meeting the requirements necessary to qualify for the full 30 percent ITC. Under the PPA, Elk Creek assumes all of the risk of qualifying for the ITC qualification.⁷⁶

4.4.4 The Project Complies with Federal, State, and Local Environmental Regulation.

The Project will meet or exceed the requirements of all applicable federal, state, and local environmental laws and regulations. Table 12.3 in Section 12.3 provides a list of approvals the Project may need to obtain from governmental entities to demonstrate full compliance. Elk Creek is committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

The Project will comply with all relevant requirements and in addition will fulfill important state energy policies with respect to renewable energy and environmental protection. In particular, the facility meets the requirements of Minnesota Statutes §§ 216B.2422, subd. 4 and 216B.243, subd. 3a, which state that the Commission may not approve a nonrenewable energy facility unless it determines that a renewable facility is not in the public interest, or more expensive than the nonrenewable facility including consideration of environmental costs. It is further consistent with state policies relating to the reduction of greenhouse gasses.

The Project offers a cost-competitive and environmentally superior alternative to fossil fuel generators that is clearly in the public interest and can reliably deliver accredited capacity, energy, Renewable Energy Credits (“RECS”) and other environmental attributes to meet Xcel

⁷⁵ <https://www.pca.state.mn.us/air/clean-power-plan-rulemaking-minnesota>

⁷⁶ Xcel Energy, Petition (Initial Filing) *In the Matter of the Petition of Northern States Power Company for Approval of Solar Energy Purchase Agreement with Elk Creek Solar, LLC for 80 MW Solar Generation*, Docket No. E002/M-19-568 (September 11, 2019), at 9.

Energy's and its customers' needs for renewable energy generation under the Renewable*Connect Program. Approval of the Project is in the public interest because it meets all of Minnesota's laws supporting acquisition of clean, renewable energy and provides an opportunity for utilities and other customers seeking to diversify and build their energy generation portfolios.

5.0 DESCRIPTION OF PROJECT AND ALTERNATIVES (MINN. R. 7849.0250)

5.1 PROPOSED PROJECT

The Elk Creek Solar Project is an up to 80 MW solar photovoltaic ("PV") facility located in Rock County, Minnesota (Figure 1). Elk Creek has obtained leases and purchase options for 976 acres of privately-owned land (Land Control Area, Figure 2). Based on preliminary design, Project facilities will cover approximate 681 acres (Preliminary Development Area, Figure 3). The portion of the Land Control Area for which Elk Creek has entered into Purchase Option Agreements with the landowners for the land on which the Project would be constructed will be purchased by Elk Creek after the Site Permit is issued and prior to the start of construction. There are approximately 295 acres of the Land Control Area for which Elk Creek has site control that are currently not contemplated for occupation by solar facilities. The 295-acre portion of the Land Control Area that will not be utilized by the Project is currently under lease with the underlying landowner and will be excluded from the area leased by Elk Creek during operation of the Project. The Project would interconnect into the existing ITC 161-kV Magnolia Substation, which is adjacent to the Project. Elk Creek selected this location based on a number of factors, but a key consideration in the selection process was the Project's proximity to existing electrical and transportation infrastructure, including the Magnolia Substation and existing transmission lines. Existing infrastructure in the immediate vicinity allows Elk Creek to minimize the need to construct ancillary facilities beyond the main Project footprint. Elk Creek selected the specific Land Control Area based on significant landowner interest, transmission and interconnection suitability, optimal solar resource, and minimal impact on environmental resources.

The Project will be comprised of solar modules (panels) and linear axis tracking rack system, inverters, step-up transformers, electrical cables and conduits, electrical cabinets, access roads, the Project substation, security fencing, below-ground or above-ground electrical collection and communication lines, an O&M facility, parking lot, up to two weather stations (up to 20 feet tall), a 161-kV overhead gen-tie transmission line less than 1,500 feet in length, and a SCADA system, and temporary laydown areas (see Figures 3 and 4). The footprint of the arrays is the same for the below-ground and hybrid below-ground / above-ground collection systems, but is slightly different for the above-ground collection systems (see Figures 3 and 4). The difference is a result of above-ground poles potentially casting shadows on the arrays. To avoid shadows on the arrays, for the above-ground electrical system, there is approximately 100 feet between the arrays and the access road located to the south of the arrays, and the above-ground collection line with poles is located on the south side of the access road parallel to the access road. As a result of the additional spacing requirements for an above-ground collection system, some arrays were shifted within the Preliminary Development Area from that which was designed for the below-ground or hybrid electrical collection systems.

The Project will utilize PV panels with tempered glass varying in sizes approximately 4 to 6.5 feet long by 2 to 3.5 feet wide, and 1 to 2 inches thick. The solar panel will convert energy from sun into direct current (“DC”) electrical power. The panels will be installed on a tracking rack system that utilizes galvanized steel and aluminum for the foundations and frame with a motor that allows the racking to rotate from east to west throughout the day. Each tracking rack will contain multiple panels. On the tracking rack system, panels will be up to 15 feet in height. Height may vary due to manufacturer, topography and vegetation constraints and may reach a height of approximately 20 feet. Depending on the technology selected, the PV panels may have an aluminum frame, silicon, and weatherized plastic backing or a side-mount or under-mount aluminum frame, heat strengthened front glass, and laminate material encapsulation for weather protection.

A linear axis tracking rack system allows the PV panels to track the solar resource throughout the day. The panels and tracking rack system are generally aligned in rows north to south with the PV panels facing east toward the rising sun in the morning, perpendicular to the ground during mid-day, and then west toward the setting in the afternoon. The panels are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day.

Sets of panels will be electrically connected in series and terminated at an inverter. Electrical wiring will connect the panels to inverters, which will convert the power from DC power (approximately 1,500 volts) from the panels to AC power (650-950 volts depending on the inverter specifications). Next, a transformer will step up the AC voltage of generated electricity from the inverter output voltage to 34.5 kV. The electrical collection system will be installed below-ground, above-ground, or a combination of both. From the transformers, electrical cable will be buried below-ground, or pole mounted above-ground for routing to the Project substation where the electricity will be stepped up from 34.5 kV to 161 kV to interconnect to the existing transmission infrastructure.

If a below-ground collection system is utilized, the panels will deliver DC power to the inverters through cabling that will be located in a below-ground trench (approximately four feet deep and one to two feet wide). Below-ground AC collection systems from the inverter skids to the Project substation will be installed in trenches or ploughed into place at a depth of at least four feet below grade. During all trench excavations the topsoil and subsoil will be removed and stockpiled separately in accordance with the Agricultural Impact Mitigation Plan (“AIMP”). Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil. Electrical collection technology is rapidly evolving and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system.

For below-ground cabling, inverter skids will be utilized at locations throughout the Preliminary Development Area and include a transformer to which the inverters will feed electricity (Figure 3). The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project’s preliminary design assumes below-ground cabling to represent the maximum potential impacts and has proposed 34 central inverter skids (one inverter is required for every 2-3 MW). These skids provide the foundation for the inverter, transformer, and SCADA system. The skids will be placed atop a concrete slab or pier

foundations and typically measure 10 feet wide by 25 feet long, with a structure height of approximately 12 feet above grade. Concrete foundations will be poured onsite or precast and assembled off-site.

Figure 5 is a photograph of the existing Saint John's University Solar Farm in Collegeville, Minnesota ("Saint John's Solar Farm"). The Project will utilize similar components and look very similar to the Saint John's Solar Farm, except if the Project utilizes an above-ground electrical collection system, in which event electrical cables will be visible below the panels, at the end of rows and potentially between wood poles.

Figure 5 Photograph of Saint John's University Solar Farm, Collegeville, Minnesota



An above-ground electrical system is being considered for the Project for several reasons including ease of access for operations and maintenance, reduced ground disturbance, and cost considerations. If above-ground cabling is utilized, the DC collection cables will be strung under each row of panels on steel arms and a steel cable attached to the piles. At the end of each row, hanging brackets would connect several racks/rows of cables to a common collection point near their assigned inverter/transformer skid where the cables will be routed below-ground at a minimum depth of at least four feet below grade to the inverter/transformer skid where the current is converted to AC and voltage is stepped up to 34.5 kV. The electrical cables will then be routed below-ground at a minimum depth of at least four feet below grade to a distribution-type pole. These poles would be made of wood, approximately 18 inches in diameter, up to 30 feet in height, and spaced approximately 200 feet apart. The electrical cables will then be strung on poles to the Project substation. Above-ground medium voltage collection technology is rapidly evolving and, if utilized, the number of poles will be determined based on final engineering. Cables connecting each unit of solar arrays will be directionally bored under or spanned over county roads.

For above-ground cabling, inverter skids will also be utilized at locations throughout the Preliminary Development Area and include a transformer to which the inverters will feed

electricity. The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design for above-ground cabling represents the maximum potential impacts and has proposed 34 central inverter skids (one inverter is required for every 2-3 MW).

A hybrid below-ground and above-ground electrical system is also being considered for the Project for several reasons that are also advantageous to the above-ground electrical system, including ease of access for operations and maintenance, reduced ground disturbance, and cost considerations. Similar to the above-ground system, the DC collection cables will be strung under each row of panels on steel arms and a steel cable attached to the piles. At the end of each row, hanging brackets would connect several racks/rows of cables to a common collection point near their assigned inverter/transformer skid where the cables will be routed below-ground at a minimum depth of at least four feet below grade to the inverter/transformer skid where the current is converted to AC and voltage is stepped up to 34.5 kV. The electrical cables will then be routed below-ground at a minimum depth of at least four feet below grade to the Project substation. Cables connecting each unit of solar arrays will be directionally bored under county roads.

For the hybrid below-ground and above-ground cabling, inverter skids will also be utilized at locations throughout the Preliminary Development Area and include a transformer to which the inverters will feed electricity. The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design for the hybrid below-ground and above-ground cabling represents the maximum potential impacts and has proposed 34 central inverter skids (one inverter is required for every 2-3 MW).

5.1.1 Nominal Generating Capability and Effect of Economies of Scale

The total nameplate capacity for the proposed Project facilities is up to 80 MW AC. The facility will be designed utilizing a DC to AC ratio that optimizes the accredited capacity of the array according to MISO guidelines, the site specific interconnection capacity and the losses associated with cable losses, thermal losses and other associated derates. The Project will generate up to 80 MW, enough energy to provide electricity for approximately 19,000 homes annually and avoid the emission of approximately 119,000 metric tons of carbon annually.⁷⁷ Larger solar projects, such as the Project, can realize some economies of scale by spreading out the relatively fixed transaction, operation, and maintenance costs over the entire Project, resulting in decreased costs per kWh of electricity produced.

Generally, economies of scale (system size) do not affect the generation characteristics of the proposed facilities due to the fact that the efficiency of a photovoltaic system depends primarily on the characteristics of the individual modules and the inverter. This allows excellent flexibility to adjust system size for site specific constraints without impacting the facilities' overall efficiencies.

⁷⁷ Based on EPA Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh annual production PVSYST model.

The total installed capital costs for the Project are estimated to be approximately \$118 million, with Project cost depending on variables including, but not limited to, construction costs, taxes, tariffs, and panel selection, along with associated electrical and communication systems, and access roads. Economies of scale do affect the capital cost of the Project. The price for which Elk Creek will sell the energy was determined as a result of PPA negotiations with Xcel Energy.

5.1.2 Annual Capacity Factor

A net capacity factor of between approximately 22.2 percent and 24.0 percent, with projected average annual output of between approximately 156,000 and 168,000 MWhs, is anticipated for the Project.

5.1.3 Fuel

The Project will generate electricity from sunlight; therefore, no fuel is required.

5.1.4 Anticipated Heat Rate

The conversion of solar to electricity does not generate heat as combustion or nuclear electricity generation facilities would when generating electricity. Therefore, heat rates are not applicable to a solar project.

5.1.5 Facility Location

Elk Creek is proposing to build its solar facility in Sections 27, 34 and 35, Township 103, Range 44, Rock County, Minnesota. Elk Creek has obtained leases and purchase options for 976 acres of privately-owned land (Land Control Area, Figure 2). Based on preliminary design, Project facilities will cover approximate 681 acres (Preliminary Development Area, Figure 3). The portion of the Land Control Area for which Elk Creek has entered into Purchase Option Agreements with the landowners will be purchased by Elk Creek after the Site Permit is issued and prior to the start of construction. There are approximately 295 acres of the Land Control Area for which Elk Creek has site control that are currently not contemplated for occupation by solar facilities. A 295-acre portion of the Land Control Area that will not be utilized by the Project is currently under lease with the underlying landowner and will be excluded from the area leased by Elk Creek during operation of the Project.

In this Application, Elk Creek is providing a preliminary Project layout for both a below-ground electrical collection system (Figure 3) and an above-ground electrical collection system (Figure 4). A hybrid Project layout with a combined below-ground and above-ground electrical system would have an array layout consistent with the below-ground preliminary Project layout provided as Figure 3. All layouts under discussion are within the Preliminary Development Area and subject to final micro-siting. The Project's facilities are currently anticipated to be located within the Preliminary Development Area and include solar modules (panels) and racking, inverters, security fencing, laydown areas, Project substation, an Operation and Maintenance building, on-site below-ground or above-ground electrical collection and communication lines, and up to two weather stations (up to 20 feet tall). The preliminary Project layouts within the Preliminary Development Area reflects Elk Creek's effort to maximize the energy production of

the Project, follow applicable setbacks, and minimize impacts to the land, environment, and surrounding community. The final site layout may, however, differ from the preliminary layouts and the current boundaries of the Preliminary Development Area set forth in this Application, but will not extend beyond the outer boundaries of the Land Control Area. While Elk Creek expects that the final layout will remain considerably similar to and could include a combination of the preliminary layouts presented in Figures 3 and 4, changes may occur as a result of ongoing site evaluation, permitting process, landowner preferences, and micro-siting activities.

The Project area is rural with an agricultural-based economy. The Land Control Area was selected based on significant landowner interest, transmission and interconnection suitability, optimal solar resource, and minimal impact on environmental resources.

5.2 AVAILABILITY OF ALTERNATIVES (MINN. R. 7849.0250(B))

Minn. R. 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 objective of this alternatives analysis is to determine whether there are other energy sources that can better satisfy the need identified for the Project. The Commission granted Elk Creek a partial exemption from this data requirement, and Elk Creek will discuss only renewable alternatives.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an independent power producer like Elk Creek. Elk Creek does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, Elk Creek must keep its prices – and, thus, its costs – low enough to remain competitive. For these reasons, Elk Creek must exercise diligence in deciding where and when to pursue opportunities for capital investment in new power-generating facilities. As indicated in this Application, the current pricing for solar energy is cost effective when compared to other renewable and non-renewable sources of electricity.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated, and solar is a reliable resource. However, with respect to the alternatives discussed below, 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

Elk Creek respectfully submits and hereby incorporates by reference Xcel Energy's Integrated Resource Plan ("2015 IRP")⁷⁸, as supplemented and revised by Xcel Energy throughout that regulatory review, which was approved by the Commission, with modifications,

⁷⁸ Xcel Energy, Upper Midwest Resource Plan 2016-2030 (Initial Filing) *In the Matter of Xcel Energy's 2016-2030 Integrated Resource Plan*, Docket ID. E-002/RP-11-15-21 (January 2, 2015) eDockets ID No. 20151-105858-01 through 10; 20151-105859-01 through 10; 20151-105861-01 through 08 (approved by the Commission on January 11, 2017).

via the Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings (“January 2017 IRP Order”).⁷⁹

Further, the Commission considered Xcel Energy’s 2015 IRP and determined Xcel Energy needed to acquire approximately 650 MW of additional solar capacity.⁸⁰ Additional alternatives are considered below.

5.2.1.1 Purchased Power

Elk Creek is an independent power producer and does not purchase power. Instead, Elk Creek will sell power to Xcel Energy, or, if necessary, other utilities or other potential customers. As such, this data requirement is not applicable, and the Commission granted Elk Creek an exemption.

5.2.1.2 Upgrades to Existing Resources

Elk Creek has no existing facility in Minnesota for which it might seek improved operating efficiency. As such, this data requirement is not applicable, and the Commission granted Elk Creek an exemption.

5.2.1.3 New Transmission

Elk Creek has no plans to become involved in owning or operating transmission lines beyond the collection and feeder lines that will be needed for interconnection of the Project. The development, construction, and operation of transmission and distribution lines designed to deliver power to end use customers 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 Elk Creek an exemption.

5.2.1.4 Wind Power

Minnesota has a significant and important wind resource that can and is being used for energy and capacity services within the State’s generating portfolio. However, wind energy carries a very low capacity value in MISO (roughly 16%⁸¹) and its energy, which is produced both on and off peak, has a much lower value than solar energy, which is produced primarily during the peak hours when energy need is high. For example, wind resources do not tend to

⁷⁹ See *In the Matter of Xcel Energy’s 2016–2030 Integrated Resource Plan*, Docket No. E-002/RP-15-21, Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings (January 11, 2017).

⁸⁰ See *In the Matter of Xcel Energy’s 2016–2030 Integrated Resource Plan*, Docket No. E-002/RP-15-21, Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings, at 10 (January 11, 2017).

⁸¹ See Planning Year 2019-2020 Wind & Solar Capacity Credit (December 2018) at 3. Accessed on August 30, 2019, at <https://cdn.misoenergy.org/2019%20Wind%20and%20Solar%20Capacity%20Credit%20Report303063.pdf>

provide power in the day time during the summer when solar can provide energy to satisfy high energy loads during the summer day time hours. While wind is a good energy resource, solar is a good capacity resource. As a result, these two technologies complement each other and are not true substitutes. There is need for both wind and solar energy in Minnesota's renewable portfolio, and Elk Creek will be increasing the state's solar generation as part of an effort to increase solar's contribution to that portfolio.

5.2.1.5 Hydropower

Hydropower is also not an alternative to the Project. In 2015, hydropower in Minnesota produced 849,054 MWh of power, up slightly from 840,410 MWh in 2010, and compared to 774,729 MWh in 2005.⁸² According to the 2016 Quad Report, issues with hydropower relate to “[c]osts of maintaining and operating dams compared to other sources of energy . . . as well as increased concern about the potential negative effect dams can have on Minnesota’s river ecosystems.”⁸³ In addition, nearly all of the available hydro sites in the state have been developed. There is not sufficient new hydro resource in Minnesota to replace the output of Elk Creek.

5.2.1.6 Biomass

Minnesota communities do have accessible and low-value biomass feedstocks. However, the cost of these feedstocks vary widely, and the supply of biomass feedstock is limited.⁸⁴ Further, the environmental impacts of a biomass facility may be greater than those of the Project, due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel. For these reasons, a biomass plant is not a good alternative to the Project.

5.2.1.7 Emerging Technologies

New renewable emerging power generation technologies are being developed, and Elk Creek believes that the current approaches are not sufficiently mature to provide the output needed to match the nameplate capacity of the Project or to be cost-effective and reliable.

5.2.1.7.1 Pumped Storage

The proposed site is not suited to a pumped storage application because the topography of the site is relatively flat and pumped storage requires the storage of large amounts of water in an elevated reservoir. Therefore, pumped storage is only commercially and technically viable in locations with certain existing geology for water storage and large (i.e., steep) elevation changes.

⁸² Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2016 (hereinafter, “2016 Quad Report”), at 28.

⁸³ *Id.*

⁸⁴ *Id.*, at 27.

In addition, there is currently no net new generation from pumped storage in Minnesota.⁸⁵ 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 has been implemented on a limited basis and as with all storage technologies, it creates no net new energy generation. Accordingly, it is not an alternative to the Project.⁸⁶

5.2.1.7.3 Thermal Storage

This technology, which makes use of accumulated heat transferred to insulated repositories, is not yet commercially-proven. Moreover, the Project is intended to generate electricity, not store energy. The storage of energy is not being considered as a part of the Project. Accordingly, it is not an alternative to the Project.

5.2.1.7.4 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 produce energy in the form of electricity and heat. This energy can be applied to power vehicles and buildings. Fuel cells use a chemical reaction rather than a combustion reaction. Fuel cells have a similar level of efficiency as natural gas combustion sources, and, when using hydrogen as fuel, have nearly no pollution. Hydrogen, however, is expensive, as it requires substantial amounts of energy to produce. While much research is being done regarding hydrogen and fuel cells, the technology is not yet available on a commercial scale.

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

Under Minn. Stat. §§ 216B.2421 and 216B.243, subd. 2, and Minn. R. Ch. 7849, a CN is required for the Project because it is a “large energy facility,” *i.e.*, larger than 50 MW. As an independent power producer, Elk Creek must compete with other available technologies to sell power on the wholesale market, if necessary. Due to the size of the Project, Elk Creek has the advantage of additional economies-of-scale not available to smaller, non-CN facilities.

5.2.1.8 No Facility Alternative (Minn. R. 7849.0340)

The Commission granted Elk Creek an exemption from Minn. R. 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,

⁸⁵ EIA, Net Generation from Hydroelectric (Pumped Storage) Power by State by Sector (available at http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_12_a) (accessed August 30, 2019).

⁸⁶ See *e.g.*, <http://www.powersouth.com/wp-content/uploads/2017/07/CAES-Brochure-FINAL.pdf> (accessed August 30, 2019).

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.” Minn. R. 7849.0340(C).

Elk Creek does not have a “system,” nor does it have other generation and transmission facilities in Minnesota. As such, the requirements of Minn. R. 7849.0340 are not applicable to the Project and are not necessary to determine need for the facility. Instead, Elk Creek will provide data regarding the impact of the “no facility” alternative on its potential customers and the region.

Given that the Project is designed to provide renewable energy to Xcel Energy under the PPA, or, if necessary, other utilities or other commercial customers, 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 Xcel Energy to purchase the Project’s output to provide its customers with renewable energy that will help it target carbon greenhouse gas reductions. Such an outcome is contrary to Elk Creek’s objective for the Project and will not satisfy Xcel Energy’s or the state and regional need for renewable energy.

Notwithstanding the foregoing, Elk Creek respectfully submits Xcel Energy’s 2015 IRP to meet the requirements of Minn. R. 7849.0340. The extensively developed information found in Xcel Energy’s 2015 IRP contains all relevant information related to Xcel Energy’s system and future resource needs.

Approval of Elk Creek’s application for a CN would allow Xcel Energy to meet its energy requirements in a cost-effective and reliable manner. The alternative of not building the Project would require Xcel Energy to purchase other solar or renewable energy to satisfy the RES and other clean energy and carbon reduction standards.

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

The Commission granted Elk Creek an exemption from Minn. R. 7849.0330, which requires the applicant to provide certain data for each alternative that would involve construction of a large high voltage transmission line (“LHVTL”). Transmission facilities are not true alternatives to the Project, since the purpose of the Project is to increase the supply of available renewable energy. Elk Creek does not currently plan on installing any facilities that would be defined as an LHVTL. Thus, it is anticipated that the electricity generated will be transmitted via facilities owned or operated by others. For these reasons, Minn. R. 7849.0330 is not applicable, and the Commission granted Elk Creek an exemption from this data request.

5.2.1.10 Combinations

No combination of the aforementioned alternatives would be appropriate because, as compared to the Project, they would not enable Elk Creek to more efficiently or cost-effectively produce electric output to be purchased by utilities or private corporations to provide needed energy and satisfy the RES and other clean energy and carbon reduction standards. The Commission granted Elk Creek an exemption from this data request.

5.2.2 Economic Comparison

Table 5.2.2 below, taken from the EIA, demonstrates that solar energy generated by a PV tracking facility has a competitive capital cost and a lower operating cost than other types of renewable resources. The Project will generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass.⁸⁷ As discussed in Section 4.2.2., even though the ITC will phase down over the next several years, solar generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.⁸⁸

Table 5.2.2: Renewable Technology Costs⁸⁹

Technology	Size (MW)	Total Overnight Cost in 2018 (2018 \$/kW)	Variable O&M (2018 \$/mWh)	Fixed O&M (2018 \$/kW/yr.)
Fuel Cells	10	7,197	46.56	0.00
Biomass	50	3,900	5.70	114.39
Conventional Hydropower	500	2,948	1.36	40.85
Wind	100	1,624	0.00	48.42
Solar PV – tracking	150	1,969	0.00	22.46
Solar PV – fixed tilt	150	1,698	0.00	22.46
Solar Thermal	100	4,291	0.00	72.84

5.2.3 Alternatives Summary

The Project is the best alternative for meeting the capacity and renewable energy needs in Minnesota and the region in the near term. All other potential alternatives reviewed by Elk Creek, 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. Moreover, Elk Creek competed with other sources of energy to obtain a power purchase agreement and was able to secure a PPA with Xcel Energy. Elk Creek's analysis demonstrates that the Project is a cost-effective energy resource; the Project uses commercially proven and reliable generating technology for the electrical generation output needed; and the Project is the energy source appropriate for the site selected for the Project.

⁸⁷ See Energy Information Agency, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2019*, https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

⁸⁸ See Energy Information Agency, *Annual Energy Outlook 2019* (January 2019), at 22, <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

⁸⁹ The figures in Table 5.2.2 are taken from a report of the EIA, *Assumptions to the Annual Energy Outlook 2019, Electricity Market Module*, at 5 (February 2019) (available at <http://www.eia.gov/forecasts/aeo/assumptions/pdf/electricity.pdf>).

5.3 DISCUSSION OF PROPOSED FACILITY AND ALTERNATIVES (MINN. R. 7849.0250(C))

The Commission granted Elk Creek a partial exemption from Minn. R. 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 Minn. R. 7849.0250(B). Consistent with the Commission granting Elk Creek a partial exemption from the data requirements in Minn. R. 7849.0250(B), thereby limiting the discussion required to only renewable alternatives, the Commission also limited the information required under this data requirement to only those renewable alternatives discussed in response to Minn. R. 7849.0250(B)(4). As discussed above, no good alternatives exist. Therefore, only information regarding the Project is applicable.

Nonetheless, Elk Creek incorporates by reference Xcel Energy’s 2015 IRP to fulfill the requirements of Minn. R. 7849.0250(C). Xcel Energy’s 2015 IRP discusses those options available to meet Xcel Energy’s resource needs, and includes an analysis of the cost-effectiveness of renewable energy alternatives. This information demonstrates the need for this Project and supports Xcel Energy’s decision to purchase the energy generated by the Project.

5.3.1 Capacity Cost

Solar energy projects are accredited by MISO at a medium to high percentage of nameplate capacity. MISO provides accreditation of 50% of nameplate capacity for projects with no operating history. Once operating data is obtained, the Project receives capacity credit based on its output in the peak months of June, July and August. Geronimo has demonstrated previously that capacity accreditation based on operating projects in Minnesota can be as high as 72% of nameplate.⁹⁰ Nevertheless, costs for renewable energy facilities are typically not expressed in terms of capacity costs. The Project will deliver energy and accredited capacity to the off-taker on an as-generated basis and will receive payment for both in the form of a single \$/MWh payment. Elk Creek’s estimated total cost for the Project per kW is provided in Appendix A, Section 5.3.1, which has been designated trade secret. The largest component in the total cost of the Project will be the solar panels and tracking rack system; however, infrastructure costs for access roads and electrical collection systems also are factors.

5.3.2 Service Life

With proper maintenance, service, and replacement of parts, the expected life of the Project is 20-35 years. Elk Creek is confident that its maintenance program will result in excellent longevity for the Project.

⁹⁰ See e.g. Geronimo Energy, Distributed Solar Energy Proposal (In the Matter of the Petition of Northern States Power Company to Initiate a Competitive Resource Acquisition Process, Docket ID No. E002 / CN-12-1240 (April 15, 2013) eDockets ID. No 20134-85728-01 at 4)

5.3.3 Estimated Average Annual Availability

Elk Creek estimates that the Project facilities will be available approximately 98 percent of the year, which is consistent with industry standards.

5.3.4 Fuel Costs

There are no fuel costs associated with the Project. Nominal purchases of electricity will be necessary to run the Project, and that power will be acquired from local electricity utility, similarly to any other commercial or industrial business. For example, a 100 MW Nameplate AC Solar facility will only require approximately 120 kW of power during night hours when no energy is being generated.

5.3.5 Variable Operating and Maintenance Costs

Elk Creek's estimated variable operating and maintenance costs over a 35 year period is provided in Appendix A, Section 5.3.5, which has been designated trade secret. An advantage of solar energy facilities is that they typically are not required to go completely offline for maintenance. Small sections of the solar array can be serviced while the rest of the facility continues to deliver energy.

5.3.6 Total Cost

Elk Creek's estimated total capital cost per kWh for the Project is provided in Appendix A, Section 5.3.6, which has been designated trade secret. This estimate assumes typical solar farm design, construction, and operational data for a 35-year estimated service life. The price for which Elk Creek will sell the energy was determined as a result of Elk Creek's internal modelling.

5.3.7 Estimate of Facility's Effect on Rates

Minn. R. 7849.0250(C)(7) requires an applicant to estimate its proposed project's "effect on rates system-wide and in Minnesota, assuming a test year beginning with the proposed in-service date." The Commission granted Elk Creek a partial exemption from this requirement because it does not have a "system" as defined by the Rules, and it is not a utility with retail rates for the power it plans to generate. As such, the data are neither available to Elk Creek nor necessary to determine the need for the Project. Instead, Elk Creek proposes to submit data on the Project's impact on state or regional wholesale prices.

The Project's energy production will be modest in comparison to the annual energy consumption of Minnesota and the region and will likely not have a measurable effect on rates. However, the Project could ultimately play a role in stabilizing or even lowering rates by offering an alternative to conventional generation sources.⁹¹ For instance, Xcel Energy can

⁹¹ See e.g., "Clean Power Green Jobs," Union of Concerned Scientists (2009) (analyzing impacts of meeting "25 by '25" nationally on consumer electric rates); "Wind and solar reducing consumer bills," Good Energy (Oct. 2015) (analyzing impact of renewable energy usage on electric rates in the United Kingdom).

purchase output from the Project to partially replace energy from generation sources with higher or 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. For example, the Project is consistent with the State of Minnesota's goal of reducing carbon emissions. Minnesota and other states are moving forward with implementing clean energy policies, and it is anticipated that existing coal plants will be retired in an effort to comply with the state's clean energy policies.⁹²

5.3.8 Efficiency

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

5.4 MAP OF SYSTEM (MINN. R. 7849.0250(D))

The Commission granted Elk Creek an exemption from Minn. R. 7849.0250(D), which requires an applicant to include a map showing the applicant's system. As an independent power producer, Elk Creek does not have a "system." The information requested is not available to Elk Creek or relevant to the determination of need for the Project. Instead, maps showing the proposed site of the Project and its location relative to the power grid are included as Figure 2.

6.0 PEAK DEMAND AND ANNUAL CONSUMPTION FORECAST (MINN. R. 7849.0270)

The Commission granted Elk Creek an exemption from Minn. R. 7849.0270, subps. 1-6, which require the applicant to provide "data concerning peak demand and annual electrical consumption within the applicant's service area and system." Elk Creek does not have a "service area" or "system" and, as such, the requested data are inapplicable. Moreover, Elk Creek will sell power generated by the Project to Xcel Energy, or if necessary due to unforeseen circumstances, at wholesale to one or more buyers affiliated with different systems and serving different areas. Elk Creek cannot reasonably forecast peak demand for those buyers' service areas and systems due to such information being unavailable to Elk Creek.

As an alternative to the requested data, Elk Creek incorporates by reference Xcel Energy's 2015 IRP and Xcel Energy's 2020–2034 Upper Midwest Integrated Resource Plan.⁹³ Elk Creek also provides the following data regarding the regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be generated by the Project should the Commission not approve the PPA.

⁹² See *e.g.*, Jim Spencer and David Shaffer, "Minnesota vows to move ahead with clean power," *Star Tribune* (Feb. 16, 2016); Jeffrey Tomich, "MISO projects additional coal retirements under Clean Power Plan," *Midwest Energy News* (Mar. 18, 2016); "Coal made up more than 80% of retired electricity generating capacity in 2015," *EIA* (Mar. 8, 2016).

⁹³ *In the Matter of Xcel Energy's Upper Midwest Integrated Resource Plan*, Docket No. E-002/RP-19-368.

A review of utilities' IRPs requests for proposals, and similar documents confirms that utilities will seek additional renewable generation resources in the next several years.⁹⁴ For example, in the MISO region, utilities have expressed a need for more than 1,000 MW of renewable energy (including solar) before 2020. Utilities will continue to require additional renewable energy generation between 2020 and 2030. Given this demand for renewable energy, a market exists for independently produced electricity generated from solar and other renewables, including the up to 80 MW to be generated by the Project.

7.0 SYSTEM CAPACITY (MINN. R. 7849.0280)

Minn. R. 7849.0280 requires a CN applicant to provide information on the ability of its existing system to meet the forecasted demand. As an independent power producer, Elk Creek does not have a "system" as defined by the Rules. Accordingly, the Commission granted Elk Creek an exemption from this requirement and permitted Elk Creek to instead provide regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be provided by the Project. This information is provided in Section 3.0.

Regardless, Elk Creek incorporates by reference Xcel Energy's 2015 IRP and Xcel Energy's 2020–2034 Upper Midwest Integrated Resource Plan to meet the requirements of Minn. R. 7849.0280. The relevant system and service area in this case is Xcel Energy's system. Elk Creek requests that the Commission determine that the submission of Xcel Energy's 2020–2034 Upper Midwest Integrated Resource Plan fulfills this requirement.

8.0 CONSERVATION PROGRAMS (MINN. R. 7849.0290)

The Commission granted Elk Creek an exemption from Minn. R. 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.

Notwithstanding, Elk Creek incorporates by reference Xcel Energy's 2015 IRP and Xcel Energy's 2020–2034 Upper Midwest Integrated Resource Plan, which contain relevant information related to Xcel Energy's system, conservation and resource needs. The purpose of this rule is to determine need in light of a utilities' conservation efforts.

9.0 CONSEQUENCES OF DELAY (MINN. R. 7849.0300)

⁹⁴ See e.g., Xcel Energy, Upper Midwest Resource Plan 2016-2030 (Initial Filing. *In the Matter of Xcel Energy's 2016-2030 Integrated Resource Plan*, Docket ID. E-002/RP-11-15-21 (Jan. 2, 2015) eDockets ID No. 20151-105858-01 through 10; 20151-105859-01 through 10; 20151-105861-01 through 08 (approved by the Commission on January 11, 2017); Xcel Energy Carbon Report 2019 (available at https://www.xcelenergy.com/environment/carbon_reduction_plan); Minnesota Power, 2015 Integrated Resource Plan (available at <https://www.mnpower.com/Content/Documents/Environment/2015-resource-plan.pdf>) (approved by the Commission on June 10, 2015); Otter Tail Power Company, Application for Resource Plan Approval 2017-2031 (available at <https://www.otpc.com/media/1959/resource-plan.pdf>) (approved by the Commission on April 26, 2017).

The Commission granted Elk Creek an exemption from Minn. R. 7849.0300, which requires the applicant to “submit data on the consequences of delay on the potential customers and the region.” Elk Creek is not a utility and has no “system” as defined by the Rules. Thus, this data requirement is inapplicable to Elk Creek and is unnecessary to determine the need for the Project. Instead, Elk Creek provides the following data on the consequences of delay to Xcel Energy and the region.

The primary consequences of delaying construction of the Project would be that Elk Creek would not be able to fulfill its obligations to Xcel Energy to develop the facility. Delaying an up to 80 MW solar project has the potential to jeopardize Xcel Energy’s efforts to obtain solar energy in a cost-effective and reliable manner. In addition, the ITC is currently being phased down, meaning an extended delay could result in fewer tax benefits and potentially higher costs to Xcel Energy’s ratepayers.

10.0 ENVIRONMENTAL INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES (MINN. R. 7849.0310)

10.1 VISUAL IMPACTS

The Project will convert approximately 670 acres of predominately agricultural land to a solar facility characterized by complex geometric forms, lines, and surfaces that may be novel to and divergent from the surrounding rural landscape. Construction activities will occur during daylight hours, limiting impacts of lighting on light-sensitive land uses. Solar PV employs glass panels that are designed to maximize absorption and minimize reflection to increase electricity production efficiency.

To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. Today’s panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings.

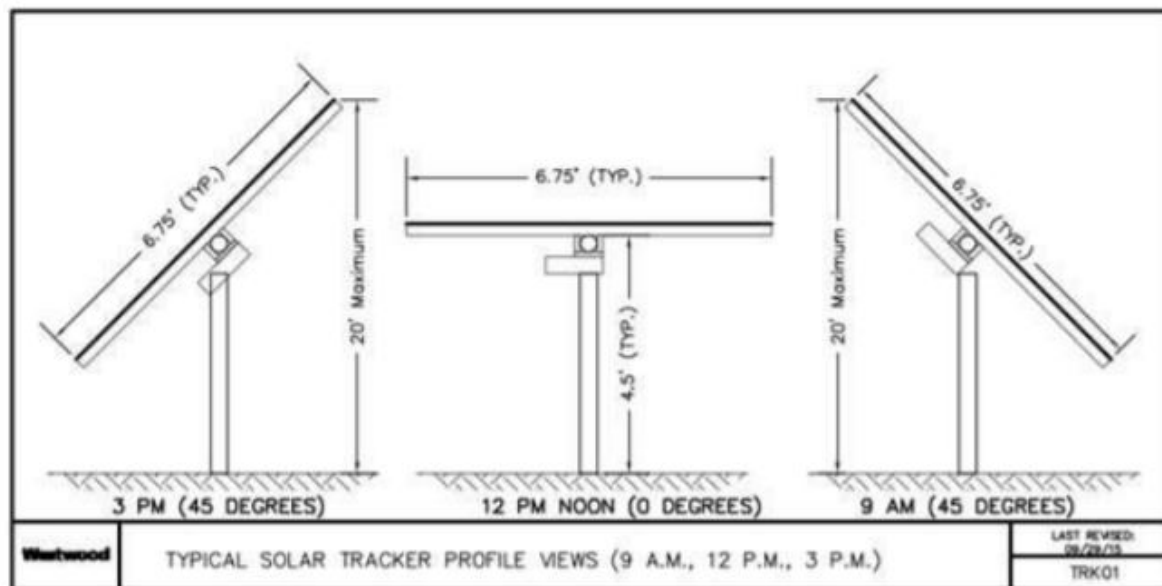
The solar fields will occupy most of the disturbed area for the solar facilities. The electrical substations and interconnection facilities, a switchyard, an O&M building, laydown areas, and access roads would take up the rest of the disturbed area. Most of the facility, including the solar field, would be low-profile, and would not exceed 20 feet in height. The Project will interconnect into the existing Magnolia Substation via a 161-kV overhead gen-tie transmission line of less than 1,500 feet. There will be a single dead-end structure within the Project substation and likely 2-3 additional structures to enter the Magnolia Substation, pending final engineering. Per Minn. Stat. 216E.01 subd. 4, the transmission line does not meet the high voltage transmission line definition because it is less than 1,500 feet. As such, a separate route permit from the Commission will not be required for the gen-tie line. Approximate dimensions of proposed facilities are provided below:

Solar Field

a. *Solar field*: Linear arrays of PV modules 4 to 6.5 feet long by 2 to 3.5 feet wide, and 1 to 2 inches thick up to 20 feet above grade, at a maximum. Height may vary due to manufacturer,

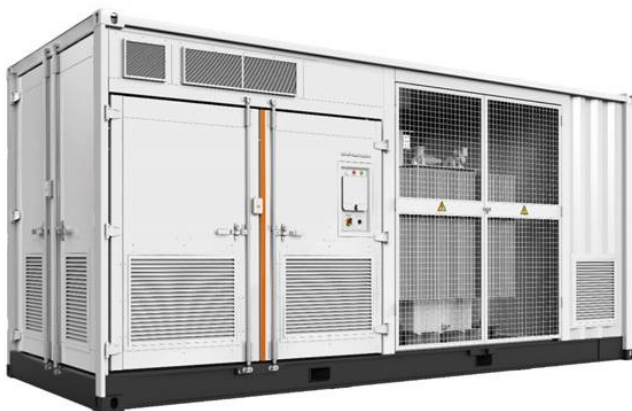
topography and vegetation constraints. A typical solar tracking rack with panels and approximate dimensions are provided as Figure 6.

Figure 6: Approximate Tracking Rack System Dimensions



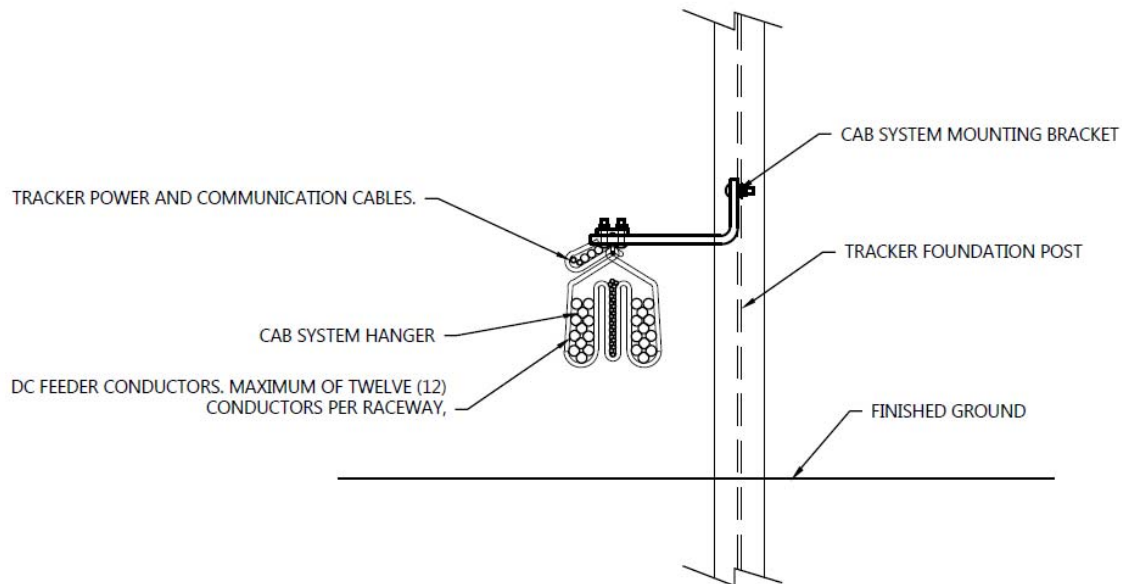
b. *Solar inverters:* The cabinets may be placed atop a concrete slab or pier foundations and typically measure 10 feet wide by 25 feet long and approximately 12 feet above grade. A typical inverter and transformer station is provided as Figure 7.

Figure 7: Typical Inverter and Transformer Station



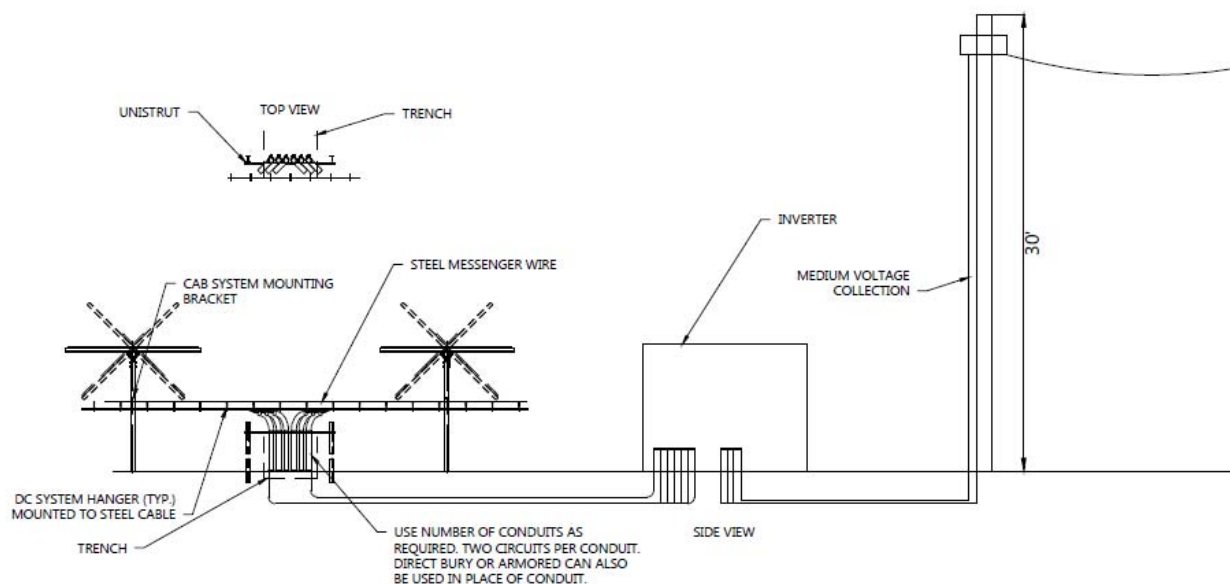
c. *Hanging Cable Brackets.* For the hybrid electrical collection system and the above-ground electrical collection system, electrical cables will be hung below the panels a hanging bracket. A typical hanging bracket is provided as Figure 8.

Figure 8: Typical Above-Ground Collection Hanging Bracket



d. *Above-Ground Collection System Components and Configuration.* If an above-ground collection system is utilized it will include the mounting brackets provided in Figure 8 above. Cabling will also be hung at the ends of array rows and will be strung from wood poles after travelling underground from the arrays to the inverters and the wood poles.

Figure 9: Typical Above-Ground Collection System Components and Configuration.



e. *Security fence*: agricultural woven fence will extend approximately 6 feet above grade with 1 foot of 3-4 strands of smooth wire around the perimeter of the facility; chain-link fence will surround the Project substation, 6 feet tall, with 3-strands of barbed wire to comply with the National Electric Code.

f. *Weather station*: Up to two weather stations up to approximately 20 feet tall.

Operations and Maintenance Area

a. *Operations and Maintenance Building*: The O&M facility will be co-located with the Project substation. The buildings typically used for this purpose are approximately 60 feet long by 40 feet wide.

b. *Lighting*: Operation of the Project will require down lit security lighting at the entrance of the Project. The typical pole height will be ten feet and manual by switch as well as motion activated if an intrusion is detected. There will be lights at each inverter that will be down lit and switch controlled for repair purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operations.

Interconnection facilities

a. *Distribution Line*: The proposed gen-tie will be less than 1,500 feet long with characteristics similar to the existing voltage, size, and type of distribution lines in the vicinity of the interconnection point (typically distribution wires strung on wood poles and will be less than 150 feet high.) There will be a single dead-end structure within the Project substation and likely 2-3 additional structures to enter the Magnolia Substation, pending final engineering.

b. *Substation*: The Project substation will be a 34.5/161 kV step-up substation with metering and switching gear required to connect to the transmission grid. It will be located adjacent to an existing substation. The area in and around the substation will be graveled and fenced and adequate lighting will be installed around the substation for worker safety during construction and operation. The substation's area will be approximately 150 feet by 150 feet once construction is complete.

There are no residences or businesses within the Land Control Area; however, there are four residences and several agricultural buildings on parcels adjacent to the Land Control Area (see Figure 3). Table 10.1 provides distances to the nearest homes to the Project, including approximate distance to the Preliminary Development Area boundary and approximate distance to the edge of solar arrays (per preliminary design).

Table 10.1 Proximity of Residences to Elk Creek Solar Facility			
Residence	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) ¹	Distance to Nearest Inverter (feet) ¹
A	169	220	788
B	1,262	1,302	1,917
C	668	711	1,328
D	3,182	3,445	3,965
¹ Based on preliminary design.			

Residence A is located adjacent to the northwest portion of the Land Control Area west of 180th Avenue. This residence has existing vegetative screening around three sides of the farmstead, including east side adjacent to the Project. The owner of Residence A has requested the installation of approximately 150 feet of apple trees to the south of its current residence to screen the Project from its farmstead. Elk Creek has agreed to plant the apple trees during construction of the Project.

Residence B is located adjacent to the southwest portion of the Land Control Area. The residence faces southeast and has existing vegetative screening along the west and north sides of the farmstead.

Residence C is located adjacent to the southeast portion of the Land Control Area south of 131st Street. The residence faces southeast and has existing vegetative screening along the west and north sides of the farmstead.

Residence D is located adjacent to the northwest portion of the Land Control Areas east of Highway 3. The residence is screened on all sides within the farmstead.

The solar arrays will be visible from adjacent roadways and parcels but given their relative low profile, they will not be visible from long distances. Additionally, Elk Creek has designed the Project to avoid tree clearing of windbreaks and pine plantations, as defined by Rock County. In addition, the existing vegetative screening along roads, around residences, and along property lines will remain. The solar facility will be visible to vehicles on adjacent roads, snowmobilers, and local residences.

10.2 WILDLIFE

The proposed Project will have limited impacts to wildlife and will be likely only related to indirect effects associated with habitat conversion from agricultural land to the solar facility. Because any given site's acreage will be small compared to the available habitat around the site, the impacts associated with any habitat conversion will be minimal. Elk Creek will coordinate with the Minnesota Department of Natural Resources ("DNR"), U.S. Fish and Wildlife Service ("FWS") and other relevant agencies to review and ensure that the Project has been appropriately sited to avoid any direct or indirect impacts to State and Federally listed species.

11.0 FACILITY INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES INVOLVING CONSTRUCTION OF A LEGF (MINN. R. 7849.0320)

11.1 LAND USE AND REQUIREMENTS (MINN. R. 7849.0320(A))

The Project in its entirety will convert 681 acres to solar energy facilities including panels, operations facilities, substations and interconnection facilities as described in Sections 5.1 and 10.1. These facilities will be located on agricultural land. In order to reduce potential impacts to agricultural land, Elk Creek met with representatives of the Minnesota Department of Agriculture (“MDA”) on April 9, 2019 to discuss the Project. Elk Creek and MDA discussed the Project’s need to develop an AIMP and reviewed the AIMP’s contents and site-specific characteristics. On August 8, 2019, Elk Creek provided a draft of the Elk Creek AIMP; MDA reviewed and approved the draft AIMP. The draft AIMP will be included as an appendix to Elk Creek’s site permit application.

The Project would not require or cause any land use impacts for water storage, cooling systems or solid waste storage.

11.2 TRAFFIC (MINN. R. 7849.0320(B))

The major roadway in the area is Interstate 90, approximately 2.5 miles south of the Land Control Area. With the exception of CSAH 3 which forms the eastern boundary of the Project, roads that surround the Land Control Area are local county or township roads. The Land Control Area is bordered on the north by 151st Street, bordered on the south by 131st Street and bisected by 141st Street. Similarly, the Land Control Area is bordered by 180th Avenue on the west, CSAH 3 on the east, and bisected by 190th Avenue. Annual Average Daily Traffic (“AADT”) counts based on Minnesota Department of Transportation’s (“MNDOT’s”) 2016 Publication of traffic volumes for Rock County are provided in Table 11.2 (MNDOT, 2018).

Table 11.2 Annual Average Daily Traffic in the Project Vicinity		
Roadway	Year	AADT Traffic Volume Total
CSAH 3 (adjacent to Land Control Area)	2018	290
Interstate 90 (approximately 2.5 miles south of Land Control Area)	2018	10,100
CSAH 8 (one mile north of Land Control Area)	2018	210

Source: MNDOT, 2016

There will be four access points to the Project: the northern unit of the Project will be accessed from 190th Avenue and the central and southern units of the Project will be accessed from CSAH 3. There will also be an access to the Project substation from 190th Avenue.

MNDOT provided early review comments on the Project on March 5, 2019. These early comments revolved around access, vegetation management, and permitting.

There are no railroads within one mile of the Land Control Area. There is a Chicago and Northwestern railway approximately two miles south of the Land Control Area that parallels Interstate 90 and connects several towns.

The nearest Federal Aviation Administration (“FAA”)-registered airport to the Project is the Quentin Aanenson Field Airport located approximately 7.5 miles southwest of the Project. This airport operates one asphalt runway.

Access to the Project will be via existing county and township roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of Project facilities, primarily through additional traffic and slow-moving construction vehicles.

Construction traffic will use the existing county roadway system to access the Project facilities and deliver construction materials and personnel. Traffic during construction is estimated to be approximately on average 50-100 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction. It is estimated that approximately 10-20 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. Overweight or oversized loads are unlikely. If they are required, Elk Creek will obtain the appropriate approvals prior to construction. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day (AADT). Since the area roadways have AADTs that are well below capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period.

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis will monitor and maintain the facilities as needed, but traffic function will not be impacted as a result.

Elk Creek used the FAA Notice Criteria Tool to determine the need for filing 7460-1 Notice of Proposed Construction forms. The results indicated the Project does not exceed the Notice Criteria, however Elk Creek filed 7460-1 forms for the perimeter of the Land Control Area in June of 2019. On July 9, 2019, the FAA provided Determinations of No Hazard to air navigation for each of the four points around the Land Control Area. As such, Project facilities will not exceed obstruction standards and would not be a hazard to air navigation. No mitigation measures are anticipated or proposed for air traffic.

11.3 INFORMATION PERTAINING TO FOSSIL-FUELED ACTIVITIES (MINN. R. 7849.0320(C)-(D))

11.3.1 Fuel

The Project is not a fossil-fueled facility. The Project will be fueled by the sun.

11.3.2 Emissions

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

When necessary, dust from construction traffic will be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, and reduced speed limits. Emissions from construction vehicles will be minimized by keeping construction equipment in good working order. Overall, dust emissions currently experienced annually in the area through farming activities will be reduced for the life of the Project through the establishment of perennial vegetative cover.

The Project will have no air emissions and will avoid emissions associated with fossil generation facilities. Elk Creek undertook analysis using U.S. Environmental Protection Agency (“EPA”) data for emissions and generation data for the MISO-Minnesota Zone to calculate avoided emissions related to the Project. Table 11.3.2 provides a summary of the estimated reduction in pollutants from the Project based on the EPAs avoided emissions and generation tool calculator.⁹⁵

Table 11.3.2 Estimated Avoided Pollutants

Pollutant	Tons or Pounds/Year
CO ₂	(18,342 tons)
NOX	(21,394 lbs)
PM2.5	(1,431 lbs)
SO ₂	(15,410 lbs)

11.4 WATER USAGE FOR ALTERNATE COOLING SYSTEMS (MINN. R. 7849.0320(E))

The Project will not use any water for alternate cooling systems. Minimal to no washing is anticipated to be needed at Project facilities due to the naturally occurring and frequent precipitation.

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 dewatering

⁹⁵ Located at <https://www.epa.gov/statelocalenergy/avoided-emissions-and-generation-tool-avert>.

may be required during construction for electrical trenches. Water may be used during construction to provide dust control and water for concrete mixes, if applicable, and other construction purposes. If temporary dewatering is required during construction activities, discharge of dewatering fluid will be conducted under the National Pollutant Discharge Elimination System (“NPDES”) permit program and addressed by the Project’s Storm Water Pollution Prevention Plan (“SWPPP”), as required. 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 AND WASTE (MINN. R. 7849.0320(G))

The Project will not generate any radioactive or solid waste under normal operating procedures. No parts require greasing or oiling on a regular basis.

11.7 SOLID WASTE (MINN. R. 7849.0320(H))

The Project is not expected to generate significant quantities of solid waste during operation. The Project will require use of certain petroleum products such as gear box oil, hydraulic fluid, and gear grease. These materials will be recycled or otherwise stored and disposed of in accordance with applicable State and Federal regulations. In addition, some waste streams will be generated at the O&M facility. These materials will also be stored, recycled, and/or disposed of in accordance with applicable local, State, and Federal regulations.

11.8 NOISE (MINN. R. 7849.0320(I))

The main source of noise from the Project during operation will be from the inverters, which includes the air conditioners housed in each, and to a lesser extent from the transformers and rotation of the tracking system. All electrical equipment will be designed to National Electrical Manufacturer Association Standards. Table 11.8 summarizes the anticipated distance to reach the most stringent MPCA noise standard (50 dBA) from a range of inverters and trackers under consideration for use at the Project.

Table 11.8 Inverter and Tracker Noise Levels			
Facility Type	Equipment Model	Distance to 50 dBA	dBA at 50 feet
Inverter	TMEIC Solar Ware Ninja PVU-L0920GR	58 feet	51
	SMA Sunny Central 2750-EV-US	160 feet	60
	ABB PVS980	260 feet	64
Tracker	ATI DuraTrack HZ v3	5 feet	30
	NexTracker	82 feet	54

The results of noise modeling conducted by technology manufactures outlined in Table 11.8 show that noise levels will be less than 50 dBA between 58 and 260 feet from the inverter,

depending on which model is selected. Similarly, noise levels will be less than 50 dBA between 5 and 82 feet from the trackers, depending on which model is selected. As such, the Project has been designed to meet the nighttime L₅₀ dBA noise standard, as the closest home to the facility is 220 feet away from the edge of a solar array. Further, because the inverters are typically located within the middle of the solar arrays, the noise levels from Project equipment are not expected to be discernible from background noise levels at homes in the vicinity. The distance of the nearest inverter to a residence is 788 feet.

During construction, Elk Creek plans to limit construction to daylight hours. No noise impacts are anticipated during operation; therefore, no mitigation measures are proposed.

11.9 CONSTRUCTION AND OPERATION WORK FORCE (MINN. R. 7849.0320(J))

The Project will create approximately 100 construction related jobs and up to four permanent positions to operate and maintain the Project. Additional, non-construction jobs such as engineering and surveying will be needed prior to and during construction. Elk Creek used the National Renewable Energy Laboratory's ("NREL") Jobs and Economic Development Impacts ("JEDI") PV tool⁹⁶ to calculate jobs associated with the design construction and installation of the Project and estimated a total of four Full Time Equivalent jobs created during the construction cycle.

11.10 ELK CREEK WILL MANAGE THE OVERALL OPERATIONS AND MAINTENANCE OF THE PROJECT.

Elk Creek anticipates having an operations agreement with another entity for performance of Balance of Plant ("BOP") O&M. The BOP O&M provider will be an experienced third party. Elk Creek and its O&M contractors will hire employees or other appropriate contractors to complete operations and maintenance tasks.

11.11 NUMBER AND SIZE OF TRANSMISSION FACILITIES (MINN. R. 7849.0320(K))

Electrical wiring will connect the panels to inverters, inverters will transform the power from DC to AC current. The AC current will be stepped up through transformer to 34.5 kV and brought via the collection cables to the Project substation. These cables may be installed in an above-ground or below-ground system. Below-ground systems will be installed per the National Electrical Code that requires specific burial depths. Cables connecting each unit of solar arrays may be directionally bored under or spanned over county roads. The Project will interconnect into the existing Magnolia Substation via a 161-kV overhead gen-tie transmission line of less than 1,500 feet. There will be a single dead-end structure within the Project substation and likely 2-3 additional structures to enter the Magnolia Substation, pending final engineering.

The interconnection details will be determined as a result of studies, discussions, and agreements with MISO. Access to transmission facilities beyond interconnection will be

⁹⁶ <https://jedi.nrel.gov/>.

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 ENVIRONMENTAL REPORT

Pursuant to Minn. R. 7849.1000 - .2100, the Department of Commerce is required to prepare an Environmental Report for any large energy facility for which a CN must be obtained.

12.2 SITE PERMIT

Elk Creek will also submit to the Commission a Site Permit application pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E) and Minnesota Administrative Rules Chapter 7850.

12.3 OTHER PROJECT PERMITS

Project permits and approvals that may be necessary to complete the Project are listed in Table 12.3. Elk Creek will obtain these approvals, as necessary, prior to Project construction.

Table 12.3: Project Permits and Approvals

Table 12.3: Project Permits and Approvals			
Agency	Permit	Applicability	Permit Status and Timing
Federal			
US Army Corp of Engineers	Section 404 Permit for wetland impacts.	Dredging or filling jurisdictional waters of the United States	To be obtained prior to construction, if necessary
U.S. Environmental Protection Agency	Spill Prevention, Control, and Countermeasures Plan	Required if any facility associated with the Project (O&M or substation) has oil storage of more than 1,320 gallons	To be obtained prior to construction, if necessary
State			
Minnesota Public Utilities Commission	Site Permit	Construction of energy conversion facility	To be obtained prior to construction
Minnesota Pollution Control Agency	Section 401 Certification	Required for filling in jurisdictional waters of the United States and if a Section 404 permit is required from the U.S. Army Corps of Engineers	To be obtained prior to construction, if necessary

Table 12.3: Project Permits and Approvals

Agency	Permit	Applicability	Permit Status and Timing
	NPDES General Permit (includes SWPPP)	For stormwater discharges from construction activities with disturbances greater than one acre	To be obtained prior to construction
Minnesota Department of Health	Well construction permit	Required for installation of a well	To be obtained prior to construction of low-volume well at O&M Facility
Minnesota Department of Labor and Industry	Request for Electrical Inspection	Required to comply with the state electrical code	To be obtained during construction.
Minnesota Department of Transportation	Oversize/Overweight Permit for State Highways	Required to transport loads exceeding specified dimensions and/or weights on State highways	To be obtained prior to construction, if needed
Minnesota Department of Natural Resources	Water Appropriation Permit	Required if trench dewatering is needed	To be obtained prior to construction, if necessary.
State Historic Preservation Office	Review and Coordination	Provide concurrence on Phase I inventory	Completed
County/Local			
Rock County	Subsurface Sewage Treatment System Permit	Required prior to installation of any septic system in Rock County	To be obtained prior to construction
	Floodplain Development Permit	Required for development within a floodplain	Not applicable. There are no FEMA mapped floodplains in the Land Control Area
	Conditional Use Permit	Required for construction within Rock County	To be obtained prior to construction for the O&M facility and laydown areas
	LGU for Minnesota Wetland Conservation Act	Required for wetland impacts	To be obtained prior to construction
	Driveway Permit	Required for access from county roads	To be obtained prior to construction, if needed

Table 12.3: Project Permits and Approvals

Agency	Permit	Applicability	Permit Status and Timing
	Utility Permit(s)	Required for utilities installed in the right-of-way of any county highway, county state aid highway, or town road	To be obtained prior to construction, if needed
	Oversize/Overweight Permit	Required to transport loads exceeding specified dimensions and/or weights on county roads	To be obtained prior to construction, if needed

September 2019

Minnesota Public Utilities Commission

Application for Certificate of Need APPENDIX A - PUBLIC DOCUMENT TRADE SECRET DATA EXCISED

PUC Docket No. IP7009/CN-19-351

Elk Creek Solar Project

Rock County, Minnesota

Submitted by:
Elk Creek Solar, LLC
7650 Edinborough Way
Suite 725
Edina, MN 55435



APPENDIX A: PROJECT COSTS

Section 2.1 The Elk Creek Solar Project

The Project would provide an off-taker with at least **[TRADE SECRET DATA HAS BEEN EXCISED]** MW of accredited capacity to meet the off-taker's peak capacity obligations in the Midwest Independent Transmission System Operator's ("MISO") Planning Reserve Sharing Pool and up to **[TRADE SECRET DATA HAS BEEN EXCISED]** Megawatt hours ("MWh") of primarily on-peak energy each year.

Section 5.3.1 Capacity Costs

Regal has estimated the cost for the Project to be approximately **[TRADE SECRET DATA HAS BEEN EXCISED]** /kW-DC.

Section 5.3.5 Variable Operating and Maintenance Costs

Regal has estimated the variable operating and maintenance costs for the Project to be approximately **[TRADE SECRET DATA HAS BEEN EXCISED]**/kWh over a 35 year period.

Section 5.3.6 Total Cost

Regal estimates total capital costs to be approximately **[TRADE SECRET DATA HAS BEEN EXCISED]** per kWh.

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September 2019

Minnesota Public Utilities Commission

Application for Certificate of Need FIGURES

PUC Docket No. IP7009/CN-19-351

Elk Creek Solar Project

Rock County, Minnesota

Submitted by:

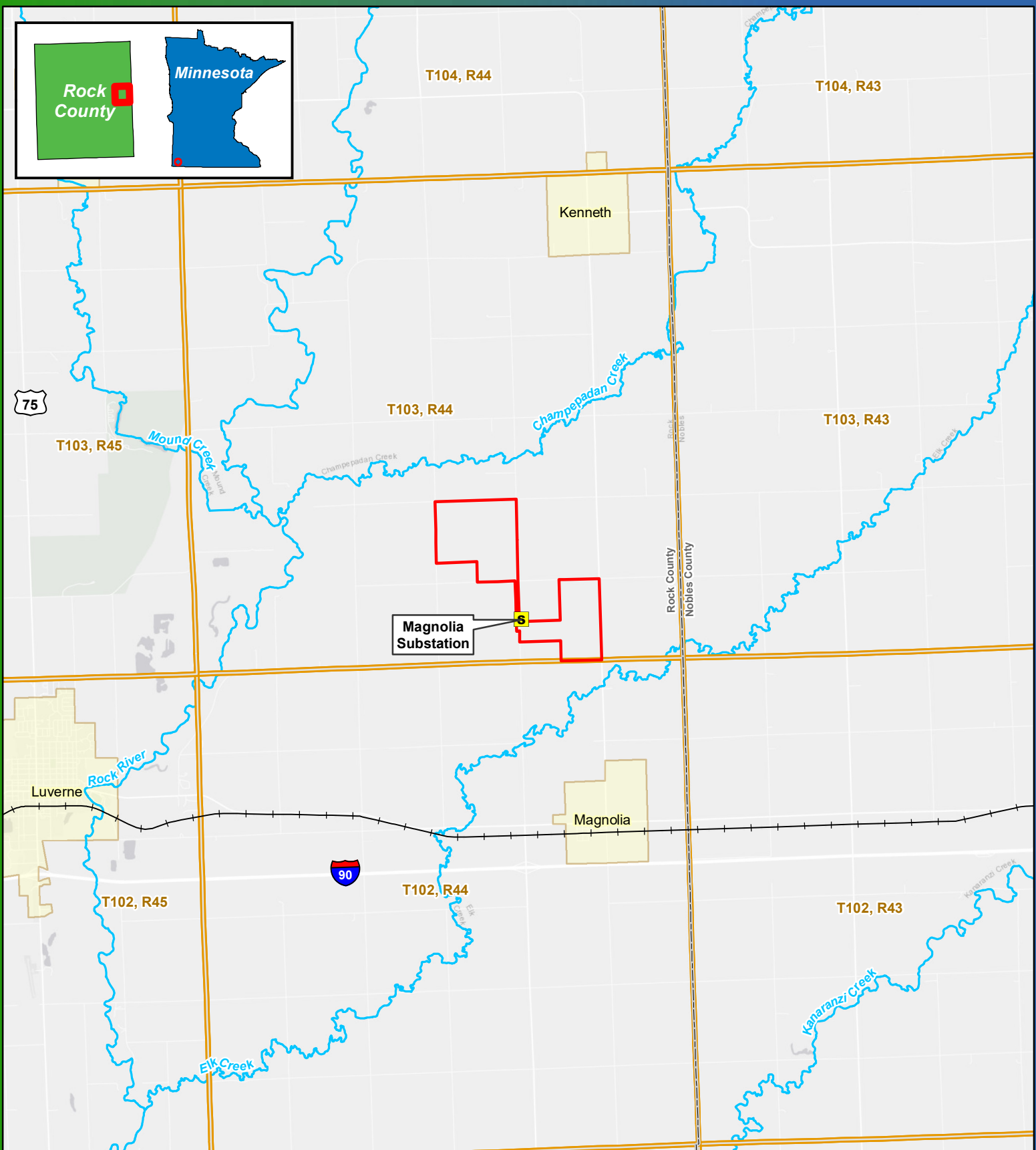
Elk Creek Solar, LLC

7650 Edinborough Way

Suite 725

Edina, MN 55435



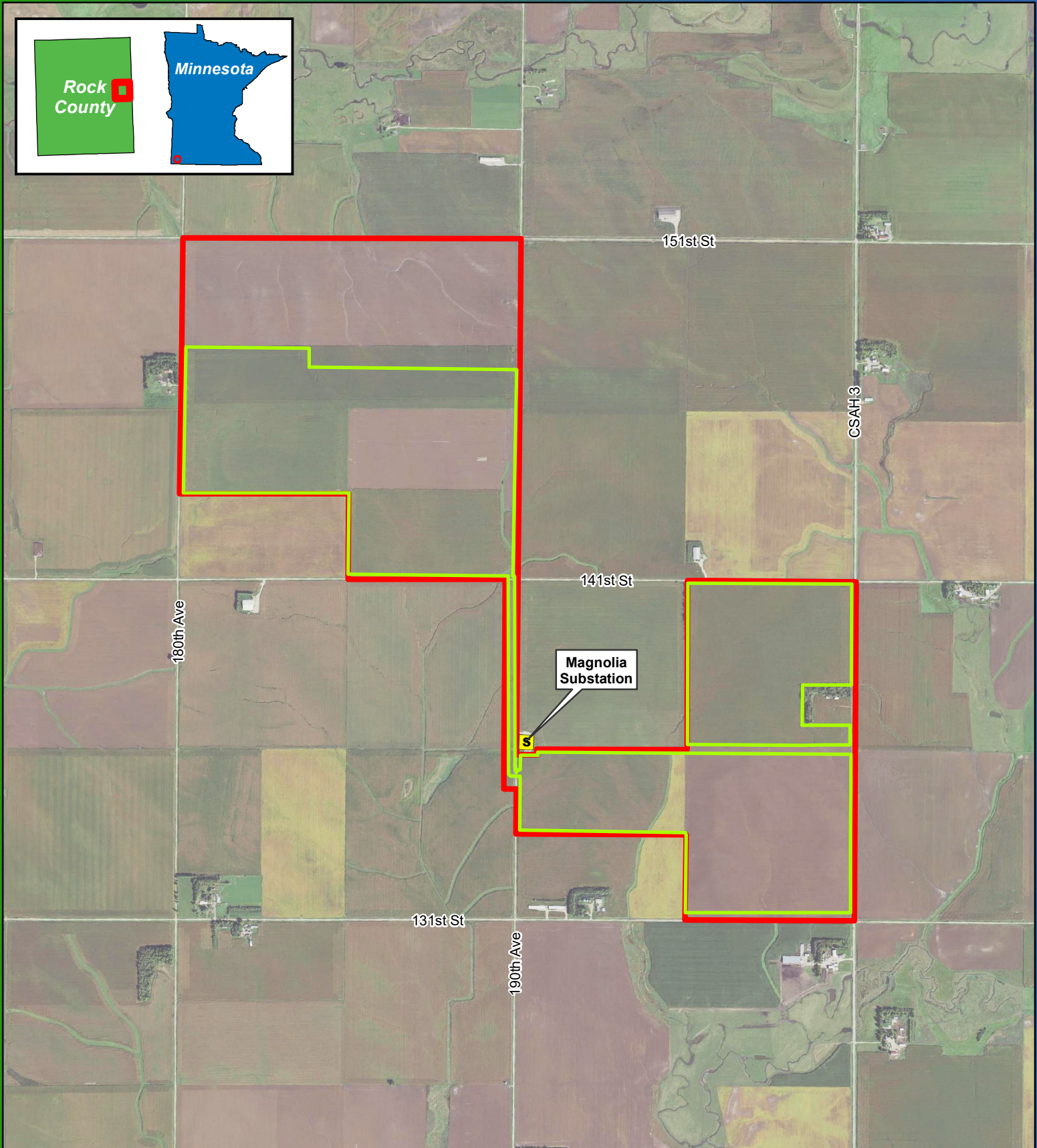
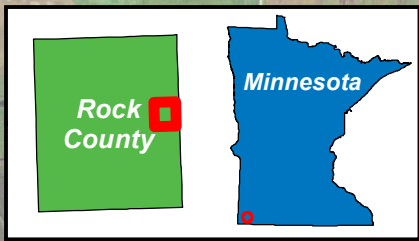


0 1 2 Miles

1:100,000

Figure 1
Project Location
Elk Creek Solar Project
Rock County, MN
 43.68038, -96.10199

- S Existing Substation
- Land Control Area
- City/Town
- Township
- County Boundary
- ~~~~~ NHD Named Stream
- + + + railroad



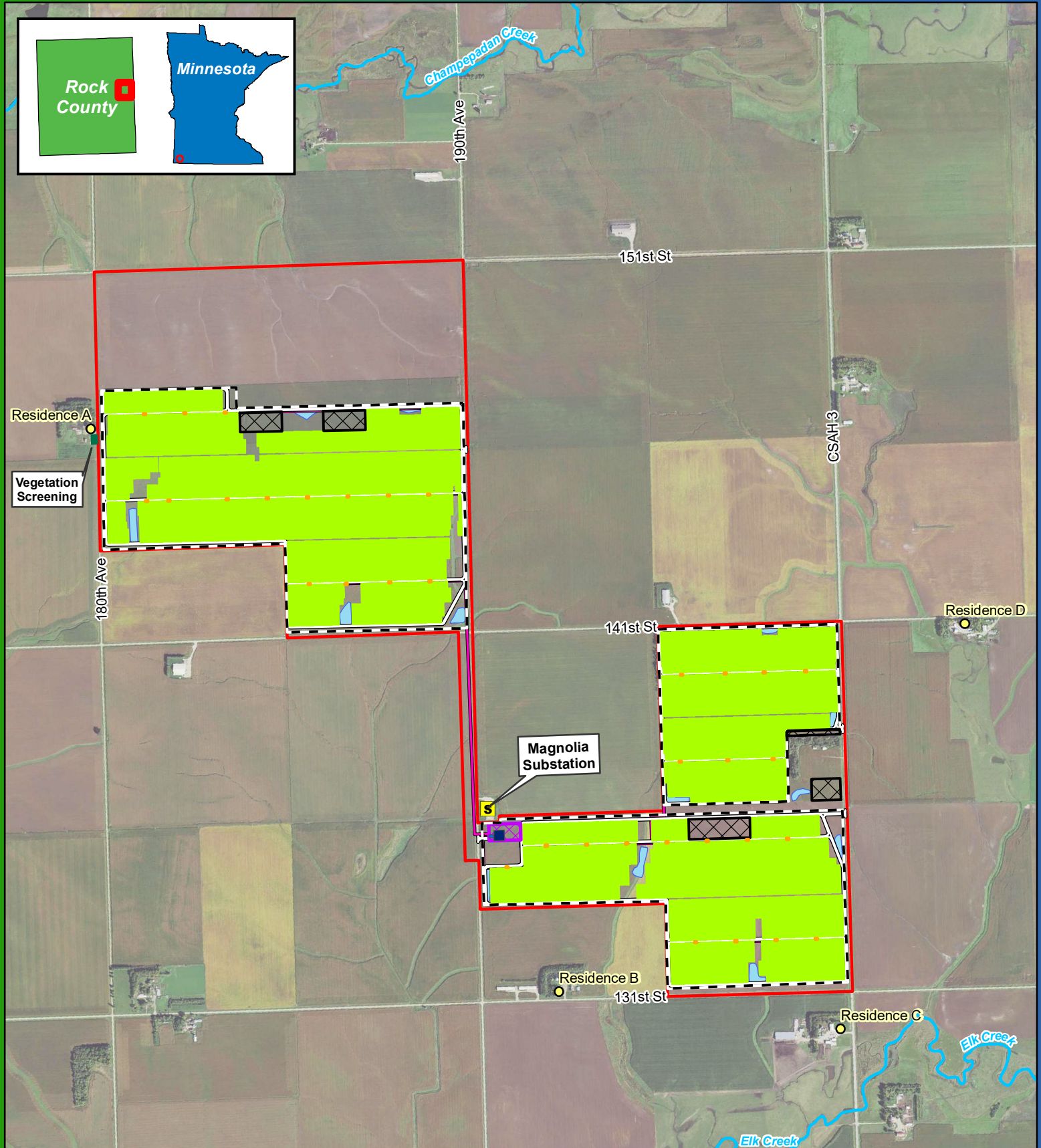
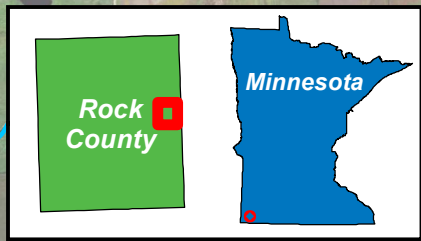
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Figure 2
Land Control and
Development Areas
Elk Creek Solar Project
Rock County, MN
43.68038, -96.10199

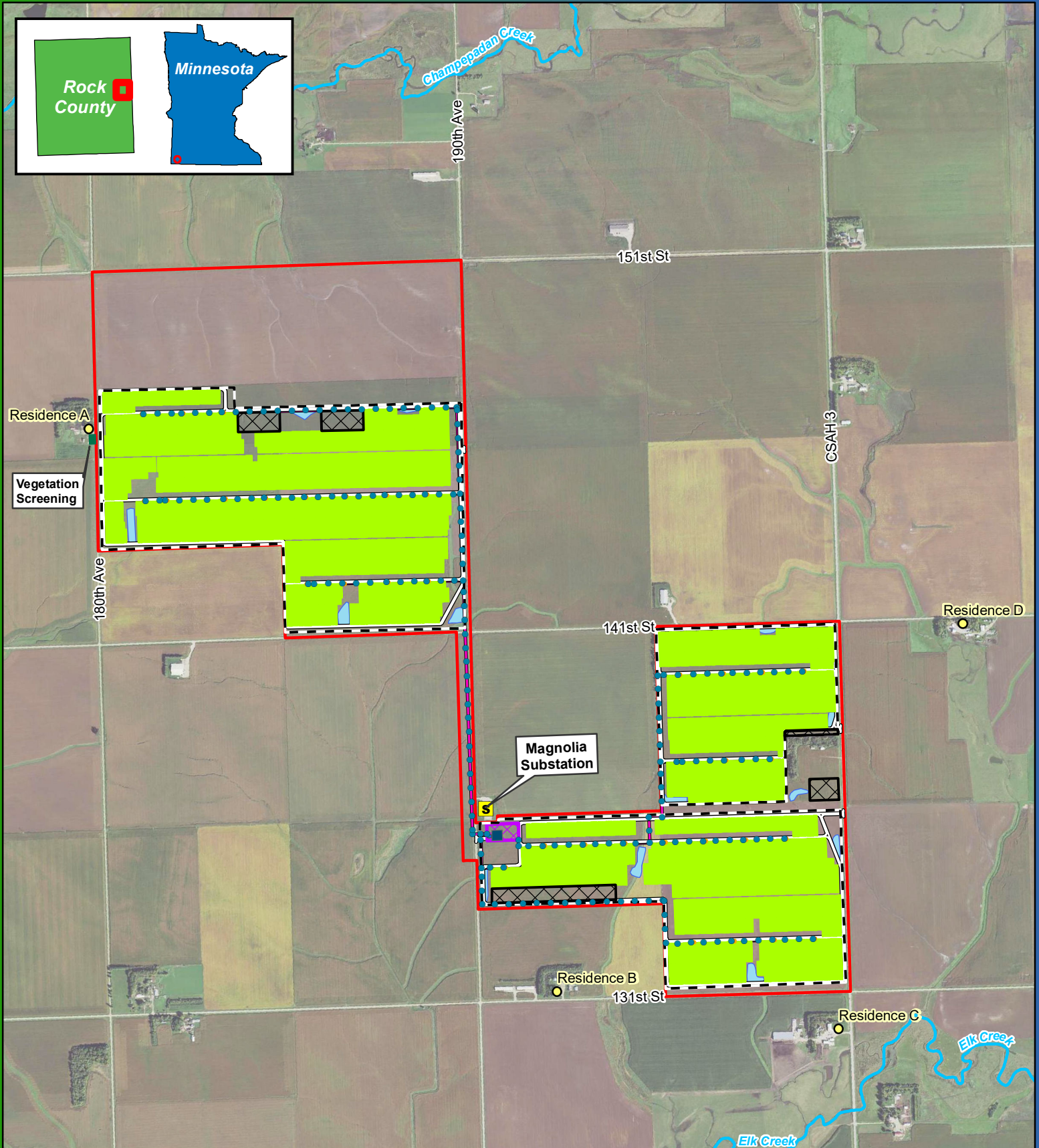
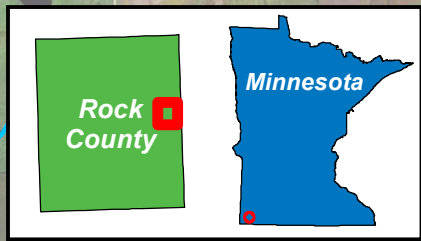
-  Existing Substation
-  Land Control Area
-  Preliminary Development Area



0 0.25 0.5 Miles
1:22,000

Figure 3
Below-Ground
Preliminary Project Layout
Elk Creek Solar Project
Rock County, MN
43.68038, -96.10199

- | | |
|----------------------|-----------------------|
| Adjacent Residence | Inverter |
| Existing Substation | Project Substation |
| Collection Line | O&M Facility |
| Vegetation Screening | Associated Facilities |
| Land Control | Laydown |
| Security Fence | NHD Stream |
| Access Road | Drainage Basin |
| Solar Array | |



0 0.25 0.5 Miles

1:22,000

Figure 4
Above-Ground
Preliminary Project Layout
Elk Creek Solar Project
Rock County, MN
43.68038, -96.10199

- Above-Ground Collection Pole
- Adjacent Residence
- Existing Substation
- Collection Line
- Vegetation Screening
- Land Control Area
- Security Fence
- Access Road
- Solar Array
- Inverter
- Project Substation
- O&M Facility
- Associated Facilities
- Laydown Area
- NHD Stream
- Drainage Basin