Site and Route Permit Application to the Minnesota Public Utilities Commission

Boswell Solar Project
Minnesota Power
Itasca County, Minnesota

December 2024

Docket Numbers E015/GS-24-425 and E015/TL-24-426

Project Name:	Boswell Solar Project
Project Location:	Itasca County, Minnesota
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Contents

Tables

Figures

Maps

Appendices

Abbreviations

Agricultural Impact Mitigation Plan	AIMP
Allied Radio Matrix for Emergency Response	ARMER
Alternating Current	AC
Amplitude Modulation	AM
Average Annual Daily Traffic	AADT
Avian Power Line Interaction Committee	APLIC
Bald and Golden Eagle Protection Act	BGEPA
Best management practices	BMPs
Building Officials and Code Administrators	BOCA
Burlington Northern Santa Fe	BNSF
Carbon dioxide equivalent	CO_2e
Certificate of Need	CN
Climate and Economic Justice Screening Tool	CEJST
Climate Resilience Evaluation and Awareness Tool	CREAT
Conservation Reserve Enhancement Program	CREP
Conservation Reserve Program	CRP
County Road	CR
Decennial Census	DEC
Decibels	dB
Department of Commerce	DOC
Department of Employment and Economic Development	DEED
Direct Current	DC
Ecological Classification System	ECS
Electromagnetic interference	EMI
Endangered Species Act	ESA
Energy and Environmental Review and Analysis	EERA
Environmental justice	EJ
Federal Aviation Administration	FAA
Frequency Modulation	FM
Gauss	G
Generation Interconnection Agreement	GIA
Greenhouse gas	GHG
Important Bird Area	IBA
Information for Planning and Conservation	IPaC
Institute of Electrical and Electronics Engineers	IEEE
Integrated Resource Plan	IRP
Intergovernmental Panel on Climate Change	IPCC
International Building Code	IBC
Kilovolt	kV
Kilovolts per meter	kV/m

kilowatt-hour	kWh
Large Electric Power Generating Plant	LEPGP
lectric and magnetic fields	EMF
Leech Lake Band of Ojibwe	LLBO
Local government unit	LGU
Megawatt alternating current	Mwac
Megawatts	Mw
Midcontinent Independent System Operator	MISO
Migratory Bird Treaty Act	MBTA
MilliGauss	mG
Minnesota Department of Agriculture	MDA
Minnesota Department of Health	MDH
Minnesota Department of Natural Resources	DNR
Minnesota Department of Transportation	DOT
Minnesota Pollution Control Agency	MPCA
National Electric Code	NEC
National Electrical Safety Code	NESC
National Institute of Environmental Health Sciences	NIEHS
National Oceanic and Atmospheric Administration	NOAA
Native plant communities	NPC
Natural Heritage Information System	NHIS
Natural Heritage Review	NHR
Noise Area Classification	NAC
Obstruction Evaluation/Airport Airspace Analysis	OE/AAA
Operations and maintenance	O&M
Photovoltaic	PV
Point of Interconnection	PI
Public Utilities Commission	PUC
Public Water Access	PWA
Regional Operations and Control Center	ROCC
Reinvest in Minnesota	RIM
Request for Proposal	RFP
Right-of-way	ROW
Scientific and Natural Areas	SNA
Shared Socioeconomic Pathway	SSP
Sites of Biodiversity Significance	SBS
Species in Greatest Conservation Need	SGCN
Spill Prevention, Control, and Countermeasure	SPCC
State Historic Preservation Office	SHPO
Stormwater Pollution Prevention Plan	SWPPP
Supervisory Control and Data Acquisition systems	SCADA
U.S. Army Corps of Engineers	USACE
U.S. Department of Agriculture	USDA

U.S. Environmental Protection Agency	EPA
U.S. Fish and Wildlife Service	USFWS
Uniform Building Code	UBC
Unorganized Territory	UT
Vegetation Management Plan	VMP
Water Quality Certification	WQC
Watts per meter squared	W/m^2
Wetland Conservation Act	WCA
Wildlife Management Areas	WMA
World Health Organization	WHO

1 Introduction

Minnesota Power (Minnesota Power) is proposing to construct, own, and operate the Boswell Solar Project (Project). Minnesota Power serves approximately 145,000 retail electric customers and 15 municipal systems across a 26,000-square-mile service area in central and northeastern Minnesota. In 2023, 63 percent of Minnesota Power's total kilowatt-hour (kWh) sales served retail industrial customers in the taconite mining, paper/pulp, and pipeline industries.

The Project will have a nameplate capacity of up to 85-megawatt alternating current (MWac) photovoltaic (PV) solar energy generating facility, a 230 kilovolt (kV) transmission line (Gen-Tie Line) and associated infrastructure in Itasca County, Minnesota (Map 1). Minnesota Power proposes to build the Project within an area of approximately 1,344.5 acres of privately owned land (Site), of which 498.6 acres will be for the operation of the Project (Anticipated Development Area). The Gen-Tie Line route will be approximately 2.45 miles in length and will interconnect the solar energy generating systems to the existing Minnesota Power Boswell Energy Center Substation. The Project is in Itasca County, Minnesota. Minnesota Power respectfully submits this permit application (Application) the Minnesota Public Utilities Commission (Commission) for a Site and Route Permit pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. § 216E) and Minnesota Rules, chapter 7850. Appendix A includes a completeness checklist for the Application.

Minnesota Power submitted a project notice to local government units (LGU) on July 23, 2024. The project notice described the project and in accordance with n Minn. Stat. 216E.03, subd. 3a. Minnesota Power submitted a notice to the Public Utilities Commission (PUC) on December 18, 2024, of its intent to request a review of the Application under the alternative review process pursuant to Minn. Stat. § 216E.04, subdivision 2(8) and Minnesota Rules, parts 7850.2800 through 7850.3900.

Minnesota Power submitted a request on December 20, 2024 for a solar energy generating system size determination to the Minnesota Department of Commerce (DOC), Energy and Environmental Review and Analysis (EERA) (DOC-EERA) division in accordance with Minn. Stat. § 216E.021 (Appendix B). EERA issued a response to the request on December 30, 2024 (Appendix B).

1.1 Purpose

In Minnesota Power's 2021 Integrated Resource Plan (IRP), the Commission approved a settlement that required Minnesota Power to procure up to 300 megawatts (MW) of regional solar energy. Minnesota Power conducted a Request for Proposal (RFP) to meet this IRP requirement with an emphasis on regional solar projects that are interconnected to Minnesota Power's system. Minnesota Power's Boswell Solar Project was selected through this RFP. This Project will facilitate Minnesota Power's compliance with State of Minnesota's renewable energy and carbon-free standards under the Minn. Stat. § 216B.1691. Since 2020, Minnesota Power has been delivering 50 percent renewable energy to customers and is the first Minnesota utility to achieve this milestone. This Project will continue this path to meeting both Minnesota Power's sustainability goals and compliance with Minnesota clean energy policy requirements. While delivering increasingly clean energy to customers, Minnesota Power also aims to deliver safe, reliable, and affordable energy to customers across a smarter grid that is increasingly resilient.

Minnesota Power will submit a Surplus Interconnection Service Interconnection Request with Midcontinent Independent System Operator (MISO) for 85 MWac, seeking to share interconnection service with Boswell Unit 3, located at the Boswell 230 kV Substation. MISO is an independent, not-for-

profit organization that delivers electric power across 15 states. Approval from MISO is required to connect the Solar Facility to the electrical transmission system. Minnesota Power will enter the Interconnection Request for Surplus Interconnection Service in the second quarter of 2025. The Surplus Interconnection Service process may take up to 270 calendar days to complete, at which time Minnesota Power expects to sign the Generator Interconnection Agreement (GIA).

1.2 Applicant Information

Minnesota Power authorizes the following individuals to receive communications related to this Application:

Minnesota Power:	Drew Janke, Environmental Compliance Specialist II Telephone: 218-355-3569 Email: djanke@mnpower.com 30 West Superior Street Duluth, MN 55802
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The permittee for the Site Permit will be:

Minnesota Power:	Drew Janke, Environmental Compliance Specialist II Telephone: 218-355-3569 Email: djanke@mnpower.com 30 West Superior Street Duluth, MN 55802

1.2.1 Ownership at Time of Filing

Minnesota Power will construct, own, operate, and maintain the Project. Minnesota Power is a public utility and an operating division of ALLETE, Inc. Minnesota Power is qualified to do business in Minnesota.

Under the lease agreements, land will return to underlying landowners at the end of the operational lifespan of the Project. Appendix C provides a full list of participating landowners.

1.2.2 Proposed Ownership after Commercial Operations

Minnesota Power plans to own, operate, and maintain the Project following the start of commercial operations.

1.3 Project Schedule

Table 1-1 summarizes the estimated schedule for the Project assuming a commercial operations date of 2027. The final schedule depends on permitting timelines, and availability of required materials.

Table 1-1 Estimated Project Schedule

Activity	Schedule
MPUC Permitting Application Filing	Q4 2024
Application for Surplus Interconnection Service with MISO	Q2 2025
Construct Solar Array	Q1 2026-Q2 2027
Conduct Commissioning/Start-up	Q2 2027
Begin Commercial Operations	Q3 2027

2 Potentially Required Project Permits and Approvals

2.1 Certificate of Need for Solar Facilities

A Certificate of Need (CN) is required for a "large energy facility," defined in Minn. Stat. § 216B.2421 as: "any electric power generating plant or combination of plants at a single site with a combined capacity of 50,000 kilowatts or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system."

The Project meets the definition of a large energy facility but does not require a CN per the exemption provided in Minn. Stat. § 216B.243, subdivision 9. This exemption applies to any "solar energy generation facility that is intended to meet the obligations of Minn. Stat. § 216B.1691.

2.2 Site Permit for Solar Facilities

The Project meets the definition of a Large Electric Power Generating Plant (LEPGP) as defined in the Power Plant Siting Act and requires a Site Permit from the Commission prior to construction. In accordance with Minn. Stat. § 216E.04, subd. 2(8), Minnesota Power seeks a Site Permit for the Project under the alternative review process provided for under Minn. Stat. § 216E.04 and Minn. R. 7850.2800-7850.3900. The Applicant filed a Notice of Intent to Submit a Site Permit Application under the Alternative Permitting Process to the PUC on December 18, 2024.

2.3 Certificate of Need for Gen-Tie Line

Minn. Stat. § 216B.243, subd. 2, states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Public Utilities Commission..." In Minn. Stat. § 216B.2421, subd. 2(2), a large energy facility is defined as "any high-voltage transmission line with a capacity of 300 kilovolts or more and greater than one mile in length." The proposed Project includes a 230 kV Gen-Tie Line that is not a large energy facility. Furthermore, Gen-Tie Line is exempt from the CN under Minn. Stat. § 216B.243, subd. 8(a)(10) because it will directly interconnect solar energy generating systems to the existing Boswell Energy Center Substation.

2.4 Route Permit for Gen-Tie Line

In accordance with Minn. Stat. § 216E.03, subd 2, a Route Permit is required to construct a high voltage transmission line (100 kV or more and is greater than 1,500 feet in length). Pursuant to Minn. Stat. § 216E.04, subd. 2(4), Minnesota Power seeks a Route Permit for the Gen-Tie Line under the alternative review process provided under Minn. Stat. § 216E.04 and Minn. R. 7850.2800 to 7850.3900. Minnesota Power filed a Notice of Intent to Submit a Route Permit application under the Alternative Permitting Process to the PUC on December 18, 2024.

2.5 Additional Permits and/or Approvals

The Project will require additional permits and/or approvals beyond the Site and Route Permits. Minnesota Power will obtain required permits and/or authorizations, as well as applicable licenses, prior to construction activities. Table 2-1 summarizes the additional potential permits, reviews, and consultations for the Project.

Table 2-1 Additional Potential Permits, Reviews, and Consultations

Regulatory Authority	Permit/Authorization	Need or Description	Status and Timing
FEDERAL			
U.S. Army Corps of Engineers (USACE) - St. Paul District	Section 404 Clean Water Act permit	Dredging and/or filling Waters of the U.S.	If required, Minnesota Power will prepare a pre-construction notification for project related wetland impacts prior to construction activities.
U.S. Fish and Wildlife Service (USFWS)	USFWS coordination under Section 7 or Section 10 of the Endangered Species Act	Required if potential impacts to federally endangered or threatened species may occur.	Likely not necessary as suitable habitat for federally endangered or threatened species is absent or is not anticipated to be disturbed, but will occur prior to construction if required
Federal Aviation Administration (FAA)	Determination of No Hazard to Air Navigation (Form 7460-1 Notice of Proposed Construction or Alteration)	Required if Project features are above 200 feet tall or located within the 100:1 notification surface area.	The Project is outside of the notification area. Likely not necessary, but will confirm height of equipment closer to construction
U.S. Environmental Protection Agency (EPA) EP	Spill Prevention, Control, and Countermeasure (SPCC) Plan	Plan required where oil storage of 1,320 gallons or more occurs.	Minnesota Power will prepare a SPCC plan prior to construction for construction-related fuel storage and prior to operation for operation-related fuel storage that exceeds applicability thresholds
	Section 401 Water Quality Certification (WQC)	Required when obtaining Section 404 Individual or Nationwide Permits for wetland impacts within the exterior bounds of the Leech Lake Band of Ojibwe reservation	Likely not necessary
	Construction Stormwater Permit	Required for portions of the Project within the exterior bounds of the Leech Lake Band of Ojibwe reservation	Minnesota Power will submit a Notice of Intent for coverage under the General Permit prior to construction
STATE			
Minnesota Department of Agriculture (MDA)	Agricultural Impact Mitigation Plan (AIMP)	Identify measures that the Project will take to avoid and/or repair potential negative agricultural impacts that may result from the construction, operation, and eventual decommissioning of the Project.	AIMP developed in consultation with MDA (Appendix D)

Regulatory Authority	Permit/Authorization	Need or Description	Status and Timing
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification (WQC)/ on nontribal lands	Required when obtaining Section 404 Individual or Nationwide Permits	Likely not necessary
	Construction Stormwater General Permit, MNR100001	Construction activity exceeding one acre.	Minnesota Power will submit a Notice of Intent for coverage under the General Permit prior to construction
	Storage tank registration	Required for back-up generator aboveground storage tank if exceeding 500 gallons and underground storage tanks exceeding 110 gallons	Will occur prior to construction if required
	State Air Registration Permit (if selected backup generators do not qualify for an exemption)	Required for backup generators if they do not qualify for an exemption	Will occur prior to construction if required
Minnesota Department of Natural Resources (DNR)	Consultation and review of state threatened and endangered species and/or take permit	Potential impacts to state protected species	Initiated and discussed in Section 4.5.8
	General Permit 1997-0005 for Temporary Water Appropriations	Required if construction dewatering greater than or equal to 10,000 gallons per day or 1 million gallons per year	Minnesota Power will apply if construction dewatering exceeds the threshold quantities
	Public Waters Work Permit	Work in public waters	Not anticipated, as the project would avoid work within public waters.
	Utility Crossing License	Required for utility crossing over, under or across a public water	Minnesota Power will apply for utility crossing over a public water
Minnesota Department of Administration and State Historic Preservation Office (SHPO)	Coordination regarding the identification of Cultural and Historical Resources	To inform the Site and Route Permit process and impact analysis	Obtain concurrence on Phase I inventory prior to construction. Initiated and discussed in Section 4.4
Minnesota Department of Transportation (DOT)	Right-of-way permits and access driveway permits for DOT roads; oversize/overweight permit for state highways	If heavy equipment use will occur on DOT roads	The contractor will obtain permits as necessary prior to construction
Minnesota Department of Health (MDH)	Well construction permit	Installation of a water supply well.	Minnesota Power will obtain prior to construction, if applicable
Minnesota Department of Labor and Industry	Request for electrical inspection	Necessary to comply with state electrical codes	Inspection to be conducted after installation of electrical equipment during construction and prior to operation

Regulatory Authority	Permit/Authorization	Need or Description	Status and Timing
LOCAL			
Itasca County Soil and Water Conservation District	Wetland Conservation Act (WCA) Approval	Minnesota Power anticipates that wetlands regulated under WCA will be exempt (no loss or utilities exemption). If impacts are necessary for access, Minnesota Power will submit a joint permit application.	Minnesota Power will apply if necessary
Itasca County	Driveway/Approach Permit	Required for construction of a new approach or driveway	The contractor will obtain permits as necessary prior to construction
Itasca County	Oversize/Overweight Permit	An Oversize/Overweight permit from Itasca County is required for loads on county roads when the load exceeds size and weight requirements	The contractor will obtain permits as necessary prior to construction
City of Cohasset	ROW/Excavation/Utility Permit	Required for work occurring with ROW	The contractor will obtain permits as necessary prior to construction

3 Project Information

3.1 Location

The Project is in the city of Cohasset, unincorporated Itasca County, and Leech Lake Band of Ojibwe (LLBO) Reservation, Minnesota (Map 1, Table 3-1). Map 2 shows participating parcels; Minnesota Power obtained leases or has purchase options for each of the parcels within the Site. Appendix C provides a list of landowners.

Table 3-1 Project Location

Location	Township	Range	Section(s)
Solar Facility			
LLBO	55N	27W	2
Deer Lake Township	55N	27W	1, 11, 12
City of Cohasset	55N	26W	6, 7, 18
Gen-Tie Line			
City of Cohasset	55N	26W	7, 8, 9

The “Anticipated Development Area” is a smaller area contained within the Site, and is the anticipated area required to operate the Project (Table 3-2, Map 3). In other words, the Anticipated Development Area is the operational footprint of the Site, and the areas outside of it but within the Site may be necessary only for temporary construction workspace.

Table 3-2 Project Acreages

Term Used in Application	Total Acres
Site	1,344.5
Anticipated Development Area	498.6
Gen-Tie Line	127.2[1]

[1] The Gent-Tie Line generally consists of a 400-foot-wide corridor that partially overlaps with the Site.

3.2 Site Selection and Constraints Analysis

Minnesota Power selected the Project location based on:

- Availability of a Point of Interconnection (POI)
- Locations above a minimum threshold for solar irradiance
- Local landowner willingness to participate in the Project
- Proximity to existing Boswell Energy Center
- A developable area that is relatively flat with few sensitive resources

Minnesota Power's process for identifying a substation included analyzing previous queue filings, proposed interconnection improvements, and current technical specification of current interconnection

infrastructure. Minnesota Power chose the site over others for its proximity to the Boswell Energy Center and ability to submit a Surplus Interconnection Service request to MISO.

Minnesota Power also screened the area for development constraints (e.g., geotechnical risks, steep topography), habitat for endangered species, proximity to culturally sensitive areas, other potential environmental risks (e.g., pollutants, flood zones, current land use conflicts). Upon completion of the screening, the Project approached landowners to negotiate voluntary agreements.

3.2.1 Prohibited and Exclusion Sites

Minn. R. 7850.4400, subp. 1 prohibits power generating plants in the following locations:

- National parks; national historic sites and landmarks
- National historic districts; national wildlife refuges
- National monuments; national wild, scenic, and recreational riverways
- State wild, scenic, and recreational rivers and its land use districts
- State parks
- Nature conservancy preserves
- State scientific and natural areas (SNAs)
- State and national wilderness areas

None of these prohibited sites are within the Site (Map 4).

In addition, Minn. R. 7850.4400, subp. 3 specifies the following exclusion areas unless there is no feasible and prudent alternative:

- State registered historic sites
- State historic districts
- State Wildlife Management Areas (WMAs)
- County parks
- Metropolitan parks
- Designated state and federal recreational trails
- Designated trout streams
- State water trails

None of these exclusion sites are within the Anticipated Development Area (Map 4).

Subject to certain exceptions, Minn. R. 7850.4400 sub. 4 prohibits large energy power generating plants on more than 0.5-acre of prime farmland per MW of net generating capacity unless there is no feasible and prudent alternative (prime farmland exclusion rule). Given the up to 85 MWac net generating capacity of the Project, the prime farmland exclusion rule would allow use of up to 42.5 acres of prime farmland for the Project. The Site contains approximately 34.5 acres of prime farmland, 221.9 acres of prime farmland if drained, and 289.4 acres of farmland of statewide importance. The prime farmland would be removed from agricultural production for the 30-year operating life of the Project but not permanently removed.

The prime farmland exclusion rule does not limit the amount of farmland used for a generator if a feasible or prudent alternative is not available. Minnesota Power completed an evaluation to avoid prime farmland (Appendix E). Minnesota Power was unable to find a feasible or prudent alternative to the Project and therefore qualifies for an exception to the rule (Section 4.5.4 and Appendix E). Furthermore, Minnesota Power prepared an Agricultural Impact Mitigation Plan (AIMP) (Appendix D) and a Vegetation Management Plan (VMP) (Appendix F) to minimize Project impacts such as soil compaction, topsoil mixing, soil erosion, invasive and noxious weed species, and rutting.

3.2.2 Alternatives Considered But Rejected

As previously stated, the Project qualifies for the alternative review process. Therefore, Minnesota Power is not required to include information regarding alternative sites pursuant to Minn. R. 7850.3100 unless it rejected alternative sites. Minnesota Power did analyze other areas in Minnesota to seek a location that would meet the limits in the Prime Farmland Rule. However, these areas were determined to not be feasible or prudent for siting the Project and were not carried forward as Project alternatives (Appendix E).

3.3 Gen-Tie Line Route Selection Process

Pursuant to Minn. Stat. § 216E.04, subd. 2(4), and as specified in Minn. R. 7850.2800 to 7850.3900, transmission lines greater than 200 kV and less than 30 miles in length qualify for the alternative review process, which eliminates the obligation for an applicant to propose alternative routes within the application. Accordingly, alternative Gen-Tie Line routes are not necessary. This section describes the Applicant's development of the Proposed Route, right-of-way (ROW), and alignment.

3.3.1 Route Width

The Power Plant Siting Act directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion" (Minn. Stat. § 216E.02, subd. 1). The Act also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles" within which ROW for the facilities can be located (Minn. Stat. § 216E.01, subd. 8). Minnesota Power is requesting a 400-foot route width for the Gen-Tie Line plus an expanded area around the substation interconnections (Map 3).

3.3.2 Route Selection Process

In selecting the proposed Gen-Tie Line route, Minnesota Power considered the same factors described in Section 3.2 that were evaluated for the Solar Project in an iterative process to arrive at a Project design that minimized impacts to the environment and landowners while maximizing the efficiency of the Project. The purpose of the Gen-Tie Line is to provide the Project Substation interconnection to the grid at the

existing substation at the Boswell Energy Center. The selected route provides the shortest route possible to accomplish this purpose.

3.3.3 Proposed Route and Right-of-Way

The Project includes construction of approximately 2.45 miles of new 230 kV Gen-Tie Line that will connect the proposed Solar Project Warburg substation to the existing Minnesota Power, Boswell Energy Center substation (Map 3). Most of the new Gen-Tie Line will be designed and constructed as "double-circuit ready," with the connecting ends of the line being single circuit to the substation connections. The new 230 kV single circuit line will originate from the proposed Project Substation located just South of the Minnesota Power road in Itasca County. From the Project Substation, the Proposed double circuit Route travels east through agricultural fields and forest then continues generally east past the existing Boswell Energy Center ash ponds and related infrastructure. The Gen-Tie Line then transitions back to single circuit running south to the existing Boswell Energy Center 230kV substation.

The Proposed Route and ROW is located entirely on Minnesota Power property and is designed to avoid or minimize impacts on residences, the environment, and other sensitive resources. The Proposed Route may also cross through an existing parking lot at the northeast corner of the Gen-tie line, in order to avoid extensive below-grade utilities and rail infrastructure north of the existing roadway.

Minnesota Power anticipates using a 130-foot ROW for the entire length of the Gen-Tie Line for both the single and double circuit segments. Transmission line structures would be placed roughly in the center of the ROW, with 65 feet of ROW on each side of the centerline. The total Proposed ROW is 37.8 acres. Minnesota Power respectfully requests the Commission approve the Proposed Route and authorize a route width coextensive with the Gen-Tie Site shown on Map 3.

This Application demonstrates that construction along the Proposed Route will comply with the applicable standards and criteria set out in Minn. Stat. § 216E.03, subd. 7, and Minn. R. 7850.4100. The Project, as proposed, will support the State's goals to conserve resources, minimize environmental, human settlement, and land use impacts, and supports the State's electric energy security through the construction of efficient, cost-effective electric transmission infrastructure.

3.4 Project and Associated Facilities

The Project will have a nameplate capacity of up to 85 MWac. Project components, which are described further in Section 3.5, consist of:

- Single axis tracking PV arrays installed on driven piles
- Inverters (Alternating current (AC)- direct current (DC) inverters and medium-voltage step-up transformers)
- Electrical collection line cables
- Project substation (Warburg Lake Substation)
- Step-up transformers
- Metering equipment
- Supervisory Control and Data Acquisition (SCADA) systems

- Gen-Tie Line
- Boswell 230-kV Substation Interconnection
- Gravel access roads
- Security fencing and gates
- Stormwater management system basins
- Temporary laydown yard
- Communication shelter
- Meteorological stations

Table 3-3 provides the total anticipated acreages of the Project components and Map 3 illustrates the anticipated locations of these components. Minnesota Power designed the Project layout to maximize the operational footprint of the solar facility, with the understanding that Project components may shift within the Anticipated Development Area if needed based on engineering design, equipment availability, environmental constraints, stakeholder feedback, and constructability. The proposed equipment is preliminary and subject to change as the design advances.

Table 3-3 Acreage of Project Components

Component	Measurement or Count
Solar arrays	177,675 panels; 127.8 acres
Inverters	27 inverter skids
Buried electrical collection lines	9.4 miles
Project substations	6.4 acres; Warburg Lake Substation (4.8 acres) and BEC 230 kV Expansion (1.6 acres)
230 kV Gen-Tie Line	2.45 miles; permanent ROW 37.8 acres
Laydown yard (temporary and some permanent)	13.2 acres
Gravel access roads	9.6 acres
Stormwater management system	22.1 acres
Undeveloped areas (e.g., delineated wetland avoidance, setback areas)	944.6 acres

3.5 Engineering and Operational Design

3.5.1 Design

Solar energy generation begins with the solar panels converting energy from sunlight into DC electrical power. Sets of panels will connect in series and terminate at an inverter. The inverters will convert the DC power from the panels to AC power. The power will then be stepped-up at a transformer from 34.5 kV to 230 kV at the Project substation, transmitting generated power to the Boswell Energy Center substation.

The Project's primary components include PV panels mounted on a single-axis tracker racking system installed in linear arrays, centralized inverters, a Project substation, and a Gen-Tie Line (Map 3).

Associated facilities include electrical cables, conduit, switchgears, step-up transformers, SCADA systems, communications building, and metering equipment. The Project will include temporary and permanent laydown yards, internal Project access roads, weather stations, a stormwater management system, and security fencing and gates.

3.5.2 Photovoltaic Arrays and Solar Field

Understanding that final panel selection may change prior to construction, current design assumes a Q.Tron XL-G2.3 610w,n-type monocrystalline, bifacial solar module. The PV panels are anticipated to have:

- tempered coated dual glass,
- a tilt angle range of ±50 degrees,
- approximately 33 inches minimum of ground clearance, and
- a maximum tilt height of 8 to 10 feet above the ground surface, pending final design.

The PV panels will be on a single-axis tracker racking system in linear arrays oriented north-south. Motors located on the racking system rotate the panels on a single point to track the sun. The racking system design consists of horizontal steel support beams, known as torque tubes, with a drive train system that divides the array into two sides and is usually located in the center of the rows. The racking system is supported by vertical steel piles that are typically driven into the ground with an embedment depth of 13 to 22 feet. Figure 1 provides an illustration of the solar panel and racking system. Minnesota Power will design the tracker system and associated posts to withstand wind, snow, and seismic loads anticipated at the site.

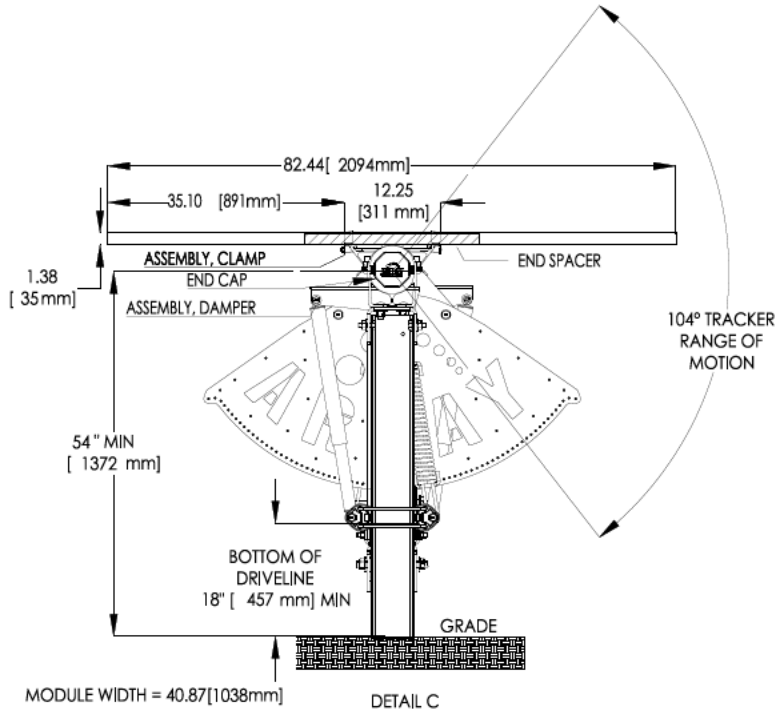

Figure 1 Typical Tracker Profile

3.5.3 Electrical Collection System and Power Conversion

Minnesota Power will install the electrical collection system and associated communication lines via trenching, plowing, and/or bore methods. Following installation, suitable native soil will be placed around the cable and compacted. According to the preliminary collector line system layout, the system will include a combination of above ground and underground lines.

Power from the panels will be transmitted to an inverter that will be mounted on a steel skid and set on a steel pile or concrete pad foundation. Each inverter skid houses AC-DC inverters, medium-voltage transformer where the electrical current is stepped up to a voltage of 34.5 kV, and a cabinet that houses power control electronics. Figure 2 illustrates a representative inverter skid, which has approximate dimensions of 3.6 feet long by 3.6 feet wide by 6.2 feet tall. The electricity is then carried via an underground medium-voltage collection system to the Project substation, then to the Gen-Tie Line, and then to the existing Boswell Energy Substation (Map 3).

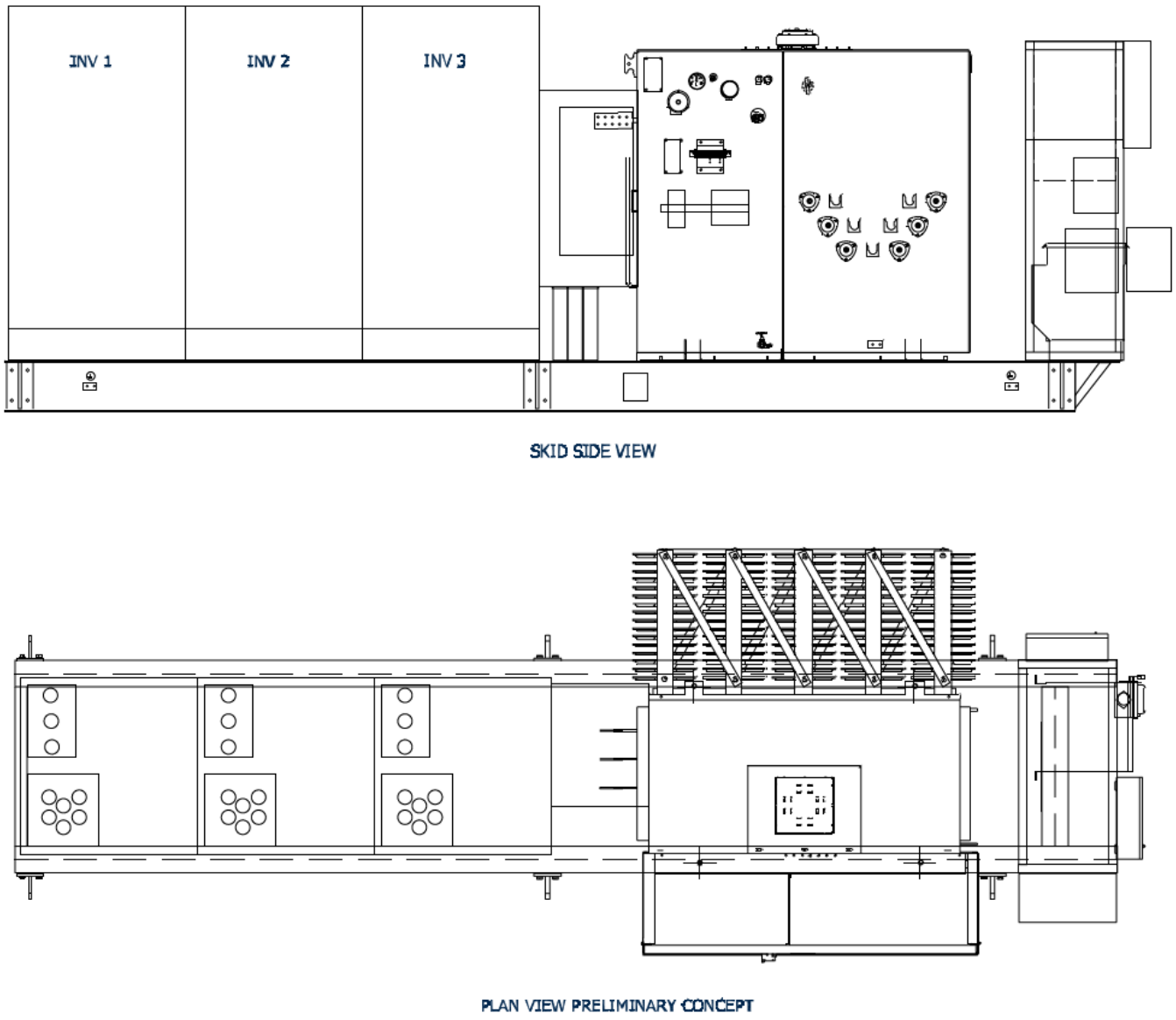

Figure 2 Inverter Example

3.5.4 Project Substation

The Project substation (Warburg substation) will be in the center of the Site (Map 3) and surrounded by a 8-foot-tall chain link security fence with 3 strands of barbed wire (Section 3.5.8). The collector system voltage transmitted from the inverters will be stepped up from 34.5 kV to 230 kV at the Project substation and transmitted to the existing Boswell Energy Center Substation. Minnesota Power will design the Project substation in accordance with Institute of Electrical and Electronics Engineers (IEEE) 605, C37, and C57.

The Project substation will consist of supporting structures for high voltage electrical structures, breakers, transformers, lightning protection, and control equipment according to the specifications of the Interconnection Agreement with MISO and Minnesota Power.

3.5.5 Substation Control House and Supervisory Control and Data Acquisition System

PV inverters will communicate with the plant SCADA in a communications shelter adjacent to the substation. The Plant SCADA will communicate with the substation via fiber between the shelter and the substation control house. A PV Power Plant Controller will coordinate the interactions of the PV field to not exceed the POI limit of 85 MWac. The Site SCADA historian will aggregate and relay information to the utility remote terminal unit to meet the requirements of the Generator Interconnection Agreement.

3.5.6 Gen-Tie Line

The Gen-Tie Line will connect the Project substation to the existing Boswell Energy Center 230kV substation. The Gen-Tie Line will consist of combination of steel monopole structure(s) and wood H-frames Figures 3, 4 and 5 illustrates the typical Gen-Tie Line structures for the Project.

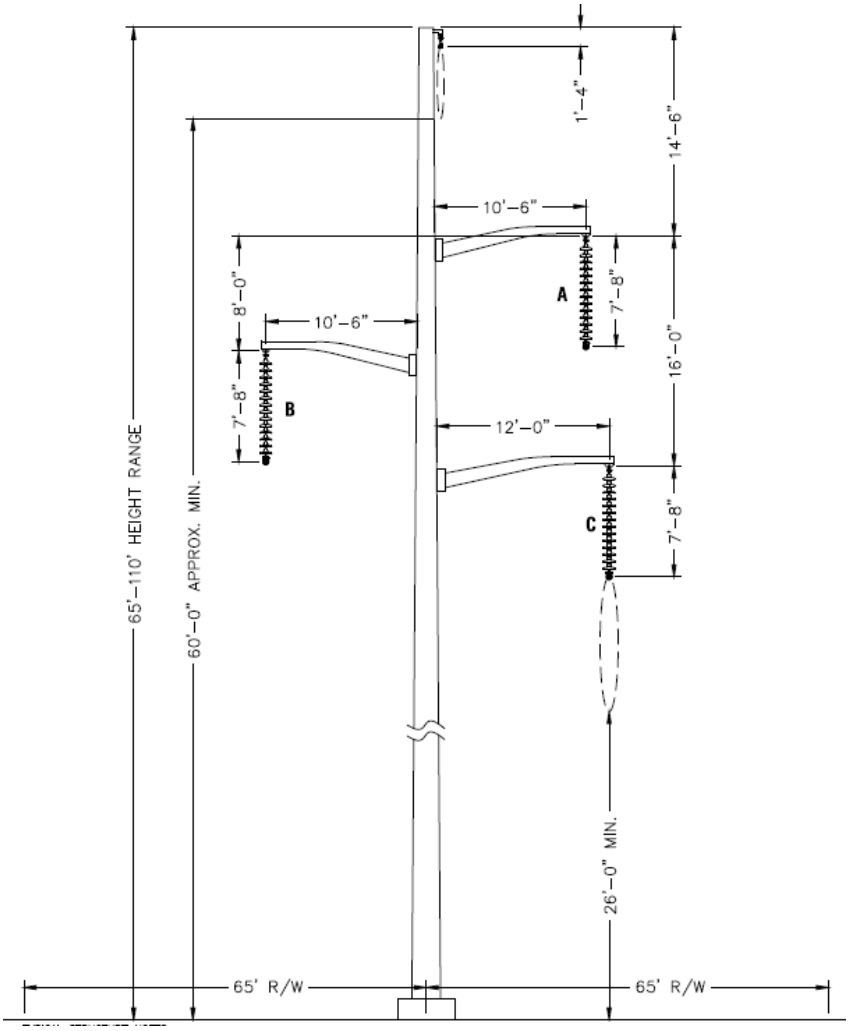

Figure 3 Gen-Tie Line Single Circuit Steel Structures

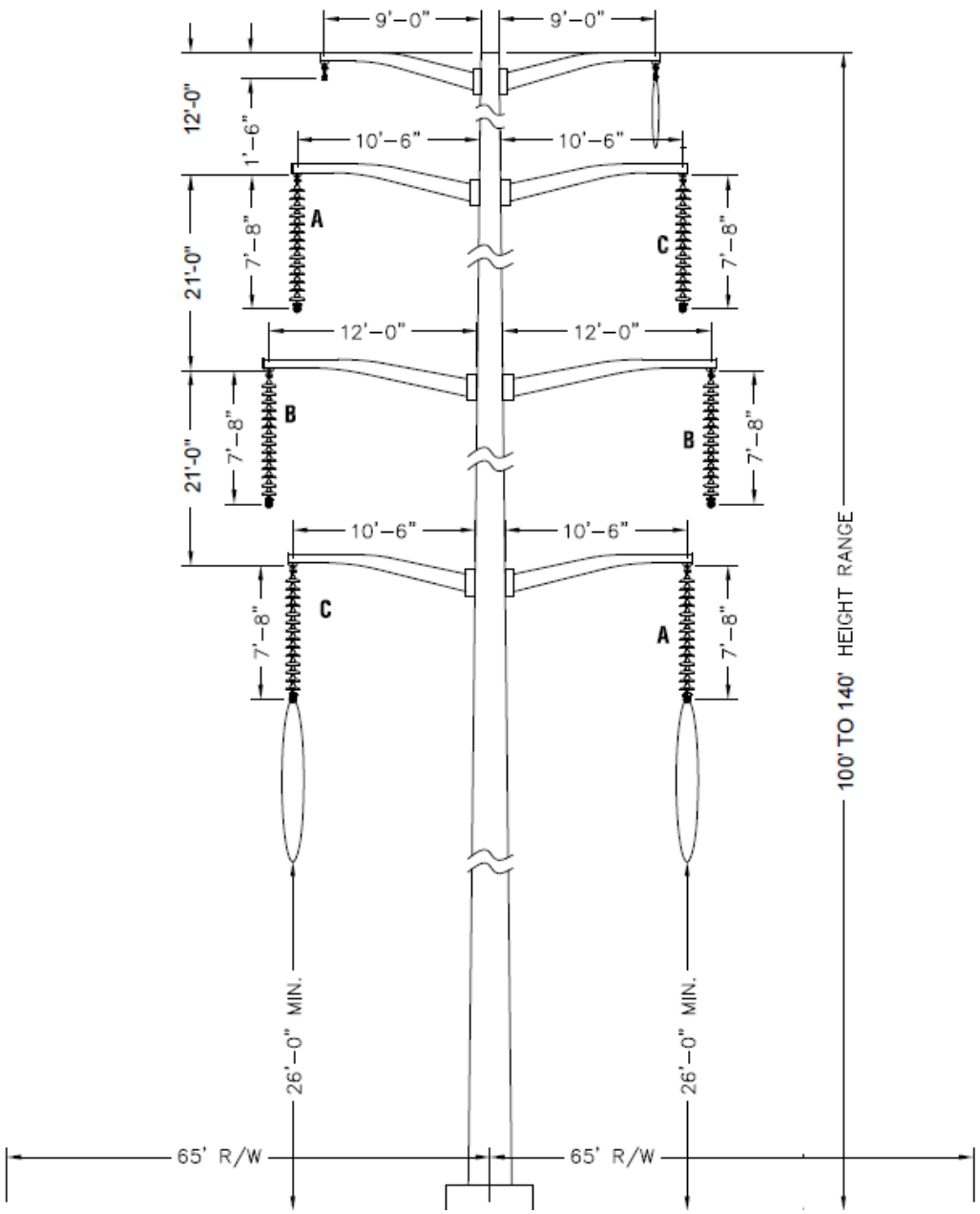

Figure 4 **Gen-Tie Line Double Circuit Steel Structures**

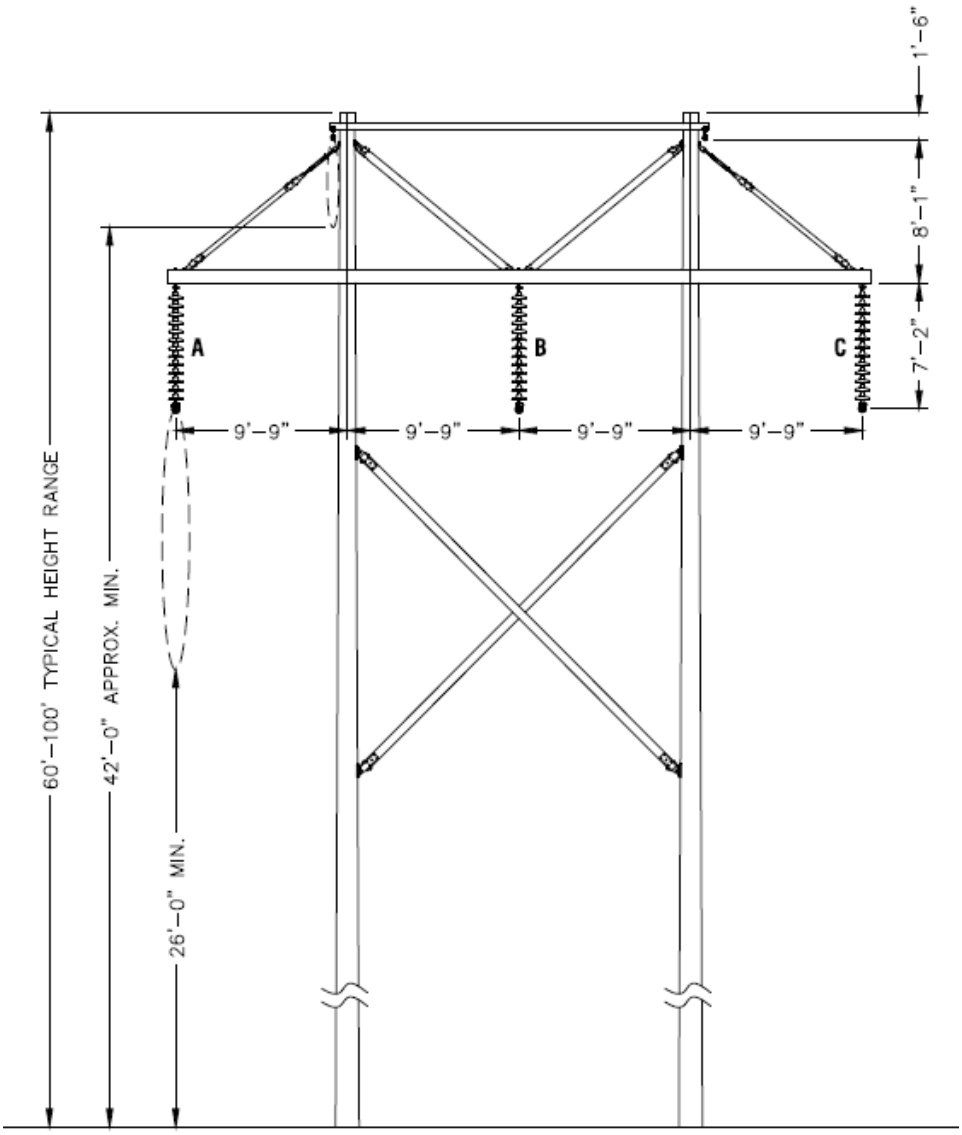

Figure 5 Typical Wood Structure

The Gen-Tie Line design will meet all relevant local and state codes, and other recognized standards such as the:

- Rural Utility Service Bulletin 1724E-200, Design Manual for High Voltage Transmission Lines
- National Electric Safety Code (NESC) C2-2023
- ASCE
- ACI and the American Institute of Steel Construction Steel Construction Manual
- North America Electric Reliability Corporation standards

- Avian Power Line Interaction Committee (APLIC) recommendations for avian protection

Minnesota Power will meet appropriate standards and safety procedures for construction and installation.

Minnesota Power will construct, own, and operate the Gen-Tie Line within a 130-foot ROW, with 65 feet on either side of the centerline for the entire route. The Gen-Tie Line will cross Minnesota Power Road at two locations before connecting to the existing Boswell Energy Center substation. ROW clearances will comply with NESC 2023 at maximum line operating condition. Conductor and all structure components will remain within the Gen-Tie Line's ROW.

3.5.7 Access Roads

Minnesota Power will construct approximately 9.6 miles of aggregate base access roads within the Anticipated Development Area. Access road widths are typically 20-feet-wide or less. During construction, access road installation and use could result in temporary soil disturbance of a maximum width of 50 feet. Once construction is complete, Minnesota Power will restore temporarily disturbed areas, including removal of excess road material and rocks greater than 12 inches, and using topsoil to return the surface to the approximate pre-construction contours, unless the landowner requests that the access road remain.

Minnesota Power will access the northwestern portion of the Project from 670th Avenue and Highway 6, the center portion from Minnesota Power Road, and the southcentral portion from Highway 6. The proposed entrances will have locked gates.

Some upgrades or other changes to the public roads may be necessary for construction or operation of the Project. Minnesota Power will work with Itasca County and/or city of Cohasset to facilitate upgrades to meet required standards and with landowners for final design considerations. Upgrades or changes could include, but are not limited to, road improvements, additional aggregate, and driveway changes.

3.5.8 Fencing

Minnesota Power will install permanent 7-foot-tall security fencing in compliance with National Electric Code (NEC) requirements along the perimeter of the Anticipated Development Area (including the PV panels, buried electrical collector cable system, and inverters) and an 8-foot tall security fence around the Project substation to prevent public and larger wildlife access (Figure 6). To this end, perimeter fencing for the Project will consist of 6'-3" minimum of Stay-Tuff Deer Fence Wire 1775-6 Class 3 or approved equal with a single barbed wire 9 inches above top of game fence fabric. End, corner, and gate posts shall be set in concrete. Fence fabric shall be no more than 2 inches above finish grade. The fencing around the Project substation will be a 7-foot-tall chain link security fence with a 1-foot-tall, barbed wire strand to comply with the NEC.

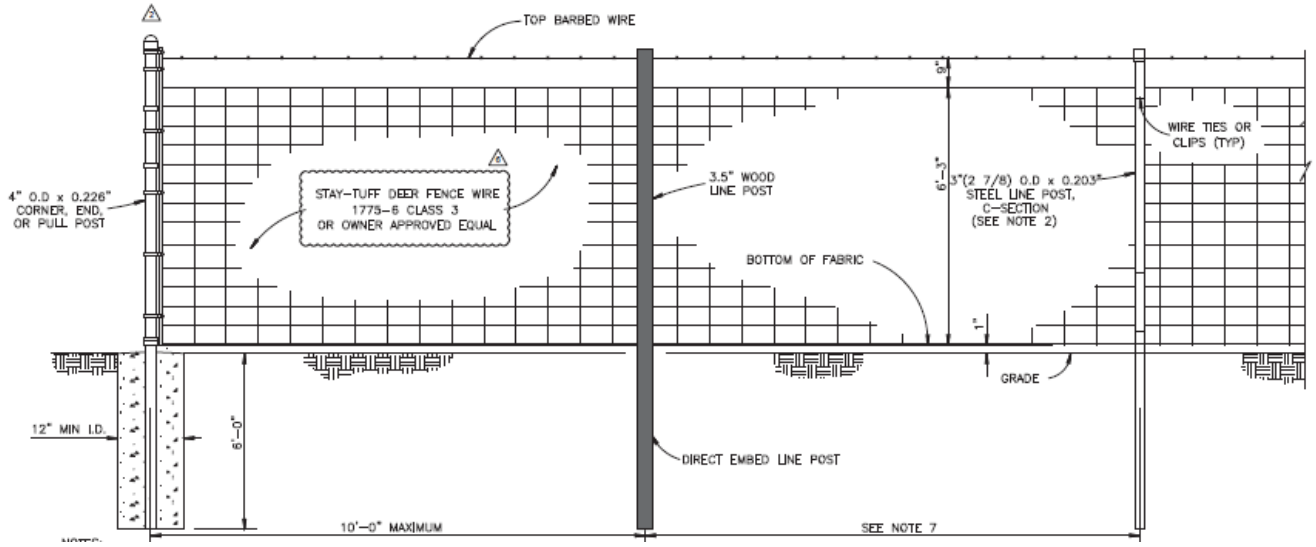

Figure 6 Typical Fence Detail

3.5.9 Stormwater Management

Minnesota Power will design the Project to consider and incorporate existing offsite drainage patterns and maintain or reduce the discharge flow rate and erosion from existing conditions. This will be achieved through establishment of native vegetation and the usage of permanent stormwater detention or retention basins, as needed, to release stormwater runoff at the existing or a reduced rate. The Project design will consider and incorporate the existing and proposed watershed conditions of the Site to minimize changes to water movement during operations. Map 3 illustrates the anticipated locations of the permanent stormwater detention or retention basins (preliminary and subject to change as the design advances).

Minnesota Power will prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Minnesota Pollution Control Agency (MPCA) standards and guidance specific to solar projects (reference (1)). The SWPPP will include erosion and sediment control best management practices (BMPs) such as construction track out controls, silt fence, permanent seeding, and vegetated buffers. This will minimize the potential for downstream water quality impacts throughout the duration of construction and operation of the Project.

3.5.10 Laydown Areas and Communication Shelter

Minnesota Power will use temporary, graveled laydown areas during construction for storage of construction materials and supplies, equipment, temporary parking for Project-related vehicles, and deliveries (Map 3). After construction is complete, Minnesota Power will restore these areas according to the VMP and SWPPP.

The Project is near the Boswell Energy Center, minimizing the need for an operations and maintenance (O&M) building; therefore, there will be a prefabricated communications shelter in place of an O&M building (Map 3). The communication shelter will be on a concrete foundation and have approximate dimensions of 14 feet long by 10 feet wide by 8 feet tall. The communication shelter will have a single entry door and will house control panels, metering, relay protection and fiber optic communications equipment, and the SCADA system. The shelter will meet the following standards:

- Uniform Building Code (UBC)
- International Building Code (IBC),
- Building Officials and Code Administrators (BOCA)
- Interstate Industrialized Buildings Commission (Minnesota Certification)
- All other relevant standards or approval authorities including but not limited to ACI, ANSI, ASTM, NFPA (NEC), and NEM

Figure 6 illustrates a typical Communication Shelter for a solar facility.

Source: reference (2)

Figure 7 Typical Communication Shelter

3.4.11 Meteorological Stations

During operation of the Project, Minnesota Power will install permanent meteorological stations at the Site to measure critical weather data such as wind speed and direction, ambient temperature, solar irradiance, etc. The meteorological towers will be approximately 10 feet tall set on a small concrete foundation. Figure 8 illustrates a typical meteorological station.

Source: reference (3)

Figure 8 Typical Meteorological Station

3.6 Construction, Commissioning, and Restoration Activities

3.6.1 Construction

Pre-construction and construction activities for the Project consist of:

- Pre-mobilization activities (approximately 18 months)
    - Complete final design of the Project
    - Procure equipment/Project components
    - Locate and mark existing utilities
    - Delineate the limits of construction disturbance areas by surveying, flagging, and staking
- Mobilization activities (approximately 3 months)
    - Install stabilized construction entrances and sediment control BMPs
    - Install any necessary temporary security fencing

    - Grade and gravel the temporary laydown areas for office trailers, storage of construction materials and shipped equipment containers, receiving construction deliveries, and temporary parking for Project-related vehicles
    - Mobilize office trailers and construction equipment
    - Receive material deliveries
    - Survey and mark the locations of access roads, solar arrays, collection system, Gen-Tie alignment
- Construction activities (approximately 18 months)
    - Remove vegetation, including tree removal, within the solar arrays and substation
    - Strip and stockpile topsoil within the solar arrays and substation
    - Construct access roads
    - Site grading
    - Install fencing, inverters, and transformer pads
    - Pile driving and installation
    - Install tracker and solar modules
    - Install inverters
    - Install collection system
    - Install the communications shelter
    - Install Gen-Tie Line (right of way preparation, foundation installation, tower installation, attach cross-arms or davit arms and insulators, and conductor stringing onto the structures)
    - Substation construction will occur simultaneously with the solar arrays

Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. Minnesota Power anticipates the Project to generate up to 125 temporary union construction jobs (85 – 110 on average) that will primarily consist of electricians, laborers, equipment operators, and management personnel.

Minnesota Power estimates that there will be up to 60 truck trips per day during construction. This volume of traffic will occur for several weeks during tracker and module delivery; however, truck traffic will decrease after these components are delivered. Light duty trucks will also be used to transport construction workers to and from the site daily (estimated up to 125 trips per day based temporary workforce). Minnesota Power anticipates using the following typical and specialty construction equipment during construction:

- Scrapers

- Bulldozers
- Dump trucks
- Watering trucks
- Motor graders
- Vibratory compactors
- Backhoes
- Side-by-sides
- Gas or diesel remote generators for power
- Telehandler for equipment offload and load, diesel
- Skid steer loader
- Pile driver
- Medium duty crane
- All-terrain forklift
- Concrete truck and boom truck
- High reach bucket truck

Minnesota Power will work with Itasca County and the AHJ to develop a traffic control plan prior to construction to minimize the impact of vehicular traffic on the local area.

3.6.2 Inspections and Commissioning

Minnesota Power will construct and operate the Project consistent with applicable state and federal safety regulations and will inspect the solar array and ancillary electrical equipment during commissioning. In addition, the interconnecting utility will inspect equipment (for grid and system safety) prior to being brought online. Once the array is installed, qualified personnel will routinely inspect, operate, and repair them as necessary pursuant to preventive maintenance schedules.

3.6.3 Restoration

As portions of the Project near completion, restoration of the temporary laydown yards and other temporary disturbance areas will occur. This includes final grading, decompacting soils, and seeding according to the Project's VMP (Appendix F) and the SWPPP. Minnesota Power anticipates that the post-construction restoration activities will take approximately four to six months.

The VMP includes additional information regarding site preparation, seed mixes, management of invasive species and noxious weeds, and ongoing management and monitoring after construction.

3.7 Operation and Maintenance

Minnesota Power will operate and maintain the Project locally and anticipates the need for two to three field solar technicians. Communication of data streams from the PV Control and SCADA equipment (located within the communication shelter) will occur to the remote Regional Operations and Control Center (ROCC) 24 hours a day and seven days a week. The Project will have an O&M Engineering team and a Technical Services Team to support the field technicians as needed.

Equipment performance and material condition support reliable operation of the solar site. Reliable operation is achieved using a strategy that includes methods to anticipate, prevent, identify, and promptly resolve equipment performance problems and degradation.

Minnesota Power uses a maintenance management system to generate preventative, predictive, and corrective tasks based upon the latest equipment manufacturer recommendations and Minnesota Power's experience. Through this preventative maintenance program, Minnesota Power strives to avoid unplanned forced or maintenance outages. Should a piece of equipment fail and result in an unscheduled outage, Minnesota Power will consider implementation of new or modified preventative measures to avoid similar failures in the future or make the necessary repairs in a timely manner and return the equipment back to service as soon as feasible. Table 3-4 identifies the routine inspection and maintenance schedule for the Project.

Table 3-4 Routine Inspection and Maintenance Schedule

Equipment	Activity Description	Frequency
Solar Modules	Visual Inspection	Annual
	Thermal Drone Scan to detect hot spots, open module cells and strings	Annual
Inverters	Visual Inspection	Every three months
	Operation and Torque Check AC/DC Connection	Annual
	Skid Transformer Oil Sample	Annual
	Detailed Inspection - includes IR scan, torque check & voltage check	Every five years
	Preventative Maintenance Check	Twice per year
Trackers	Remote-connection inspection to check for fault conditions	Daily
	Visual inspection of fasteners, bolt torque marks, damper assemblies, center structures, drivelines, and overall corrosion	Twice per year
	Visual inspection of driveline and bearing alignment, column settling, bearing wear, and motor controller conduit and seals	Annual
	Visual inspection of all hardware of one completed row per motor block	Every two years

Equipment	Activity Description	Frequency
DC Cabling and Disconnect System	Visual inspection of cabinet seal, cabinet grounds, overall condition, cable hangers and cable. Thermal image inspection of connections. Verify torques.	Annual
Supervisory Control and Data Acquisition (SCADA)	Verify readings and data points	Annual
	Visually inspect sensors and cabling for damage	Annual
	Replace battery of components with internal lithium battery	Every three years

3.8 Repowering and Future Expansion

Minnesota Power's interconnection request is for 85 MWac, and there are currently no plans for future expansion of the Project.

As the solar market continues to produce less expensive and more efficient solar panels, repowering may be a viable option as the Project ages. Potential triggers for initiating a repower may be aging or faulty equipment, maintenance costs, extending the useful life of the solar panels, or increasing the generation output. If deemed a worthwhile investment, repowering of the Project will abide by all applicable local, state, and federal regulations. A new or amended Site Permit may be necessary and will be sought if required.

3.9 Decommissioning

At the end of the useful life of the Project, Minnesota Power will be responsible for decommissioning the Project and restoring the Site to its prior use. Appendix G provides a draft decommissioning plan that conforms to agency requirements and agreements with landowners. PUC permits require updates of the decommissioning plan at five-year intervals and at project milestones such as repowering or changes in ownership. Decommissioning of the Project at the end of its useful life would consist of removing the:

- Solar arrays (panels, racking and steel foundation posts)
- Inverters
- Fencing
- Access roads
- Above-ground and below-ground portions of the electrical collection system
- Lighting

Minnesota Power will use standard decommissioning practices including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements, and restoration. Minnesota Power proposes Table 3-5 provides the estimated net decommissioning costs.

Minnesota Power will provide financial assurance through asset depreciation ("Financial Assurance"). Financial Assurance will begin on the tenth anniversary of the commercial operation date, unless there is

abandonment or decommissioning of the Project prior to that time and secured by Minnesota Power. The amount of the Financial Assurance will be adjusted accordingly to offset any increases or decreases in decommissioning costs and salvage values determined during each plan reassessment. Minnesota Power proposes to post financial assurance in the following format:

- 25% of the net decommissioning estimate will be posted in year 10.
- 25% of the net decommissioning estimate will be posted in year 15.
- 25% of the net decommissioning estimate will be posted in year 20; and
- 25% of the net decommissioning estimate will be posted in year 25.

Table 3-5 Estimated Decommissioning Costs

Item	Total
Total Estimated Decommissioning Cost	$14,056,000
Total Estimated Salvage Value	$6,947,000
Net Estimated Decommissioning Cost	$7,109,000
Total Estimated Decommissioning Cost (Low Range -30%)	$4,976,300
Total Estimated Decommissioning Cost (High Range +50%)	$9,952,600

3.10 Cost Analysis

Minnesota Power estimates the Project capital construction costs, including development; engineering, procurement, and construction; and interconnection to be approximately **[TRADE SECRET DATA BEGINS** [redacted]

[redacted]

[redacted] **TRADE SECRET DATA ENDS]** that consists of lease payments, operational staff wages, taxes, and inspection/maintenance.

4 Environmental Information

Section 4 provides a description of the existing environmental and human setting of the Project, analysis of the potential impacts of the Project and associated mitigative measures, and any unavoidable adverse environmental effects. In this Application, the term “mitigative measures” means proposed actions that will avoid or minimize impacts, including BMPs, and any proposed actions to compensate for unavoidable impacts (compensatory mitigation). Baseline conditions are described per the Site and the Gen-Tie Line (Map 3).

4.1 Environmental Setting

The Project is in a sparsely populated rural agricultural area, immediately west of and partially within the city of Cohasset, Minnesota. Several residences border and are in the vicinity of the Project, but none are within it.

The Minnesota Department of Natural Resources (DNR), in collaboration with the U.S. Forest Service, developed an Ecological Classification System (ECS) for hierarchical mapping and classification of Minnesota land areas with similar native plant communities and other ecological features. Based on the ECS, the Project is in the Chippewa Plains Subsection, right next to the St. Louis Moraines Subsection, of the Northern Minnesota Drift and Lake Plains Section of the Laurentian Mixed Forest Province (Map 21) (reference (1)).

Leech Lake and the moraines to the south are the southern boundary of this subsection. The northern boundary is the southern shore of Glacial Lake Agassiz. On the east side, the boundary of the subsection is a series of end moraines. This subsection is characterized by level to gently rolling lake plains and till plains. Ground moraines, a lake plain, stagnation moraines, and an outwash plain are the primary landforms. Annual precipitation ranges from 23 inches in the northwest to 27 inches in the east. The growing season generally lasts from 111 to 131 days. Pre-settlement vegetation in this subsection was a mixture of deciduous and conifer forests. White pine and red pine were present on the moraines, while jack pine was the dominant cover type on outwash plains and sandy lake plains. Hardwoods generally grew close to large lakes, in sheltered areas of the moraines. Sedge meadow communities were the main land cover in non-forested wetlands (reference (2)). At present, the predominant landcover within the Project consists predominantly of cultivated cropland/hay pastureland and forest, including forested wetlands and upland deciduous and mixed forest.

4.2 Human Settlement

The Site is 1,344 acres and the Gen-Tie Line route is 124.3 acres. Both the Site and the Gen-Tie Line route cross several municipal boundaries. Approximately 919 acres (68 percent) are within the city of Cohasset and consists of mostly rural undeveloped land bordering the Mississippi river. Downtown Cohasset is immediately east of the Project. The population of the city of Cohasset was reported as 2,683 in the 2022 American Community five-year Survey (reference (3)). Around 352 acres (26 percent) are within Deer Lake unorganized territory, between the city of Cohasset and the LLBO reservation. This land is rural with some cultivated crops. The population of Deer Lake was reported as 3,636 in the 2022 American Community five-year Survey (reference (4)). Approximately 73 acres (five percent) are within the LLBO reservation; this land is cultivated crops and rural undeveloped land. The population of the LLBO reservation was reported as 11,189 in the 2022 American Community five-year Survey (reference (5)). Other nearby communities include:

- The city of Grand Rapids, 5 miles to the east
- The city of Deer River, 3.3 miles to the northwest
- The city of Zemple, 3 miles to the northwest

Outside of the more concentrated residential areas listed above, the surrounding area is mostly rural and farmstead residences.

4.2.1 Public Health and Safety

Emergency services could be necessary during construction or operational activities due to injuries, equipment use, or electrocution. If emergency personnel are necessary, multiple services will likely respond, depending on the situation. Emergency response services closest to the Project include:

- Healthcare:
    - Essentia Health, Deer River, 5.5 miles from the Project (reference (6))
    - Grand Itasca Clinic and Hospital, Grand Rapids, 8.6 miles from the Project (reference (7))
    - Essentia Health Grand Rapids Clinic 9.8 miles from the Project (reference (8))
- Fire Departments:
    - Cohasset Fire Department, Cohasset, 3.2 miles from the Project (reference (9))
    - Deer River Fire Department, Deer River, 5.3 miles from the Project (reference (10))
    - Grand Rapids Fire Department, Grand Rapids, 10.2 miles from the Project (reference (11))
- Police Departments
    - Deer River Police Department, Deer River, 4.7 miles from the Project (reference (12)
    - Cohasset Police Department, Cohasset, 8.2 miles from the Project (reference (13))
    - Grand Rapids Police Department, Grand Rapids, 8.2 miles from the Project (reference (14)
    - Itasca County Sheriff's Office, Itasca, 25.4 miles from the Project (reference (15)

The Essentia Health Clinic in Deer River is the closest emergency room facility to the Project (reference (16)). Other nearby responders include Police and Fire Departments in Coleraine, and Bovey (reference (17)). Both are more than 10 miles from the Project.

The Allied Radio Matrix for Emergency Response (ARMER) system is a part of Minnesota's Statewide Communication Interoperability Plan, which aims to improve communication for emergency responders. The ARMER radio system operates by line of sight, talking to other towers. For the system to operate effectively, multiple towers are necessary to produce a solid blanket of coverage. System interruption can occur if tall objects are within the line-of-sight, typically at or near the top of a tower over 150-feet tall

(reference (18)). There are three ARMER radio towers near the Project, all are in Itasca County (reference (19)). The closest tower is in the city of Deer River, approximately 4.5 miles from the Project.

4.2.1.1 Impacts and Mitigative Measures

Solar Facility

Construction and operation of the Site will have minimal impacts on the security and safety of the local population. Minnesota Power will coordinate with emergency and non-emergency response teams for the Project, including law enforcement, fire departments, and ambulance services. The type and number of responding agencies will depend on the incident requiring emergency services. Minnesota Power will develop a Solar Project Safety Plan and Emergency Action Plans that outline local contacts (first responders and internal construction, and O&M staff) and emergency procedures for evacuation, fire response, extreme weather, injury, and criminal behavior. Additionally, construction will comply with applicable local, state, and federal safety regulations. Minnesota Power will follow industry safety procedures during and after construction of the Project such as posting clear signage during construction activities. The design and construction will meet applicable federal, state, and local standards (e.g., MISO and the National Electrical Safety Code [NESC]). The Project will also include fencing and locked gates for authorized access only.

The closest ARMER tower is approximately 4.5 miles west of the Site. The Project will not impact the ARMER towers given their distance and because no features will be within the line-of-sight near the top of these towers (i.e., greater than 150 ft above ground). Therefore, Minnesota Power does not propose mitigative measures concerning the ARMER system.

Gen-Tie Line

Anticipated impacts are the same that have been stated for the Solar Facility. Because minimal impacts are anticipated for construction and operation, Minnesota Power does not propose additional mitigative measures specific to the Gen-Tie Line.

4.2.2 Electromagnetic Fields

Electric and magnetic fields (EMFs) are invisible electric and magnetic fields present around electrical devices. Electric fields come from voltage or electrical charges, while magnetic fields come from the flow of electricity or current that travels between points. Magnetic fields, unlike electric fields, are not shielded or weakened by materials that conduct electricity, instead they pass through most materials. Electric and magnetic fields are invisible just like radio, television, and cellular phone signals, all of which are part of the electromagnetic spectrum. Both magnetic and electric fields decrease rapidly with increased distance from the source.

Electric fields are the result of electric charge, or voltage, on a conductor. The intensity of an electric field is related to the magnitude of the voltage on the conductor and is measured in kV per meter (kV/m). Magnetic fields are created and increase from the strength of the flow of current through wires or electrical devices. The intensity of a magnetic field is related to the magnitude of the current flow through the conductor and is measured in units of Gauss (G) or milliGauss (mG). EMF generated from solar arrays is extremely low frequency, like electrical appliances and wiring in homes and buildings (reference (20)). Measured magnetic fields at photovoltaic projects found very low levels of 0.5 milligauss (mG) or less, and in many cases less than background levels (0.2 mG). This was at distances of no more than 9 feet from residential inverters and 150 feet from the utility-scale inverters. These multiple studies

concluded that the strength of EMF present at the perimeter of a solar facility is significantly lower than the typical American's average EMF exposure (references (21)).

Research to determine if EMF causes health effects and biological responses has been occurring since the 1970s. Over the decades of research, human health effects of the possible impact of exposure to EMF research has been reviewed by leading health agencies, like the U.S. National Cancer Institute, the U.S. National Institute of Environmental Health Sciences (NIEHS), and the World Health Organization (WHO). The research and reviews found that exposure to EMF does not cause or contribute to adverse health effects (reference (20)).

The Project includes a Gen-Tie Line that will be built concurrently with the proposed Solar Project to the existing Minnesota Power, Boswell Energy Center substation. Table 4-1 provides the estimated maximum electric field and magnetic field strength for the Gen-Tie Line as measured from the centerline and edge of ROW.

Table 4-1 Maximum Electric Field and Magnetic Field Strength of the Gen-Tie Line

Maximum Electric Field (kV/m)	Maximum Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Near Centerline		Edge of ROW	
3.18	405.86	0.59	8.65

Minnesota, Wisconsin, and California have also performed literature reviews and research examining EMF. In 2002, Minnesota formed an Interagency Working Group to evaluate EMF research and develop public health policy recommendations for any potential problems arising from EMF effects associated with high voltage transmission lines. The Working Group included staff from several state agencies and published its findings in a White Paper titled EMF Policy and Mitigation Options. Their research found that some epidemiological studies have shown no statistically significant association between exposure to EMF or health effects, and some have shown a weak association. Studies have not been able to establish a biological mechanism for how magnetic fields may cause cancer. Scientific panels have concluded on research to date that there is insufficient evidence to prove an association between EMF and health effects (reference (22)).

Despite there being no federal standard for transmission line electric fields, the commission has imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground (reference (23)). Based on prior research the Commission has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects (reference (24))." The Commission concluded that there were no adverse health impacts from EMF anticipated for persons living or working near the Huntley-Wilmarth 345 kV Transmission Line Project (reference (25)). Similarly, there were no adverse impacts from EMF found for those with residences near the Elk Creek Project, a utility-scale solar project (reference (26)).

Anyone who relies on a medical device, like a pacemaker or other implanted device to maintain proper heart rhythm, may have concern about the potential for a solar project to interfere with the operation of the device. Researchers also found that there is no reason for concern because the EMF outside of the solar facility's fence is less than 1/1000 of the testing levels for interference (reference (27)).

4.2.2.1 Impacts and Mitigative Measures

Solar Facility

Map 5 illustrates residences in the immediate proximity of the Project. The closest residence, residence 48, is 48 feet from the Site boundary. Table 4-2 summarizes the other residences within 500 feet of the Site and their distances from solar arrays, inverters, and the substation.

Table 4-2 Nearby Residences

Residence ID	Distance from Site (feet)
48	48.4
50	107.1
41	185.5
47	228.0
45	273.1
38	294.1
42	436.8
51	483.3

The primary EMF sources from the Site will be from the solar arrays, buried electrical collection lines, and the transformers installed at each inverter. Based on various studies, the EMF health and safety impacts from solar energy facilities are negligible (reference (28)).

Gen-Tie Line

The Gen-Tie Line runs from the eastern portion of the Solar Facility directly East to the Boswell Energy Center Substation. There are no residences within 0.25 miles of the Gen-Tie Line.

At the distance of the Project components to residences and the road ROW, for both the generated electric and magnetic fields, EMF will dissipate to background levels. As such, there will be no adverse impacts; therefore, Minnesota Power does not propose mitigative measures.

4.2.3 Displacement

Displacement is the need to remove structures (e.g., homes, businesses) to facilitate the construction and operation of the Project. Displacement can occur when residences or businesses are within a proposed Site or ROW. Displacements are rare and more likely to occur in heavily populated areas where avoiding all residences and businesses is not always feasible.

4.2.3.1 Impacts and Mitigative Measures

There are no residences or businesses within the Project (Map 5); therefore, no displacement will occur. There are 8 residences within 500 feet of the Site boundary, with the closest being 48 feet away (residence number 48). There are no residences within 0.25 miles of the Gen-Tie Line.

4.2.4 Noise

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more “weight.” The A-weighted decibel

scales (dBA) is used to reflect the selective sensitivity of human hearing. This scale puts more weight on the range of frequencies that the average human ear perceives, and less weight on those that we do not hear as well, such as very high and very low frequencies.

Audible traffic sounds are likely present in the Site. U.S. Highway 2 is just north of the Project as well as several other county and township roads (Section 4.2.14). The Boswell Energy Center is east of the Project, and faint sounds from these operations are part of the existing sound character. Other sound sources in the vicinity include agricultural activities on neighboring properties, vegetation, birds, and insects. Typical rural sound levels are in the 30-55 dBA range, with variability depending on local activities, time-of-day, weather, and season.

The MPCA noise standards are set forth in Minn. R. Chapter 7030, which sets noise limits for different land uses (Table 4-3). Different standards are specified for daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) hours. The noise standards specify the maximum allowable noise volumes that may not be exceeded for more than 10 percent of any hour (L10) and 50 percent of any hour (L50). Residences are classified as Noise Area Classification (NAC) 1 per Minn. R. 7030.0050, Subp. 2. NAC 1 has the lowest noise limits of the three NACs. Table 4-3 lists the limits for NAC 1.

Table 4-3 Minnesota Noise Standards NAC 1 Noise Limits

Noise Classification	Daytime limit (dBA)		Nighttime Limit (dBA)	
	L10	L50	L10	L50
NAC – 1	65	60	55	50

Minn. R. 7030.0040

Figure 9 provides a comparison of common noise-generating sources.

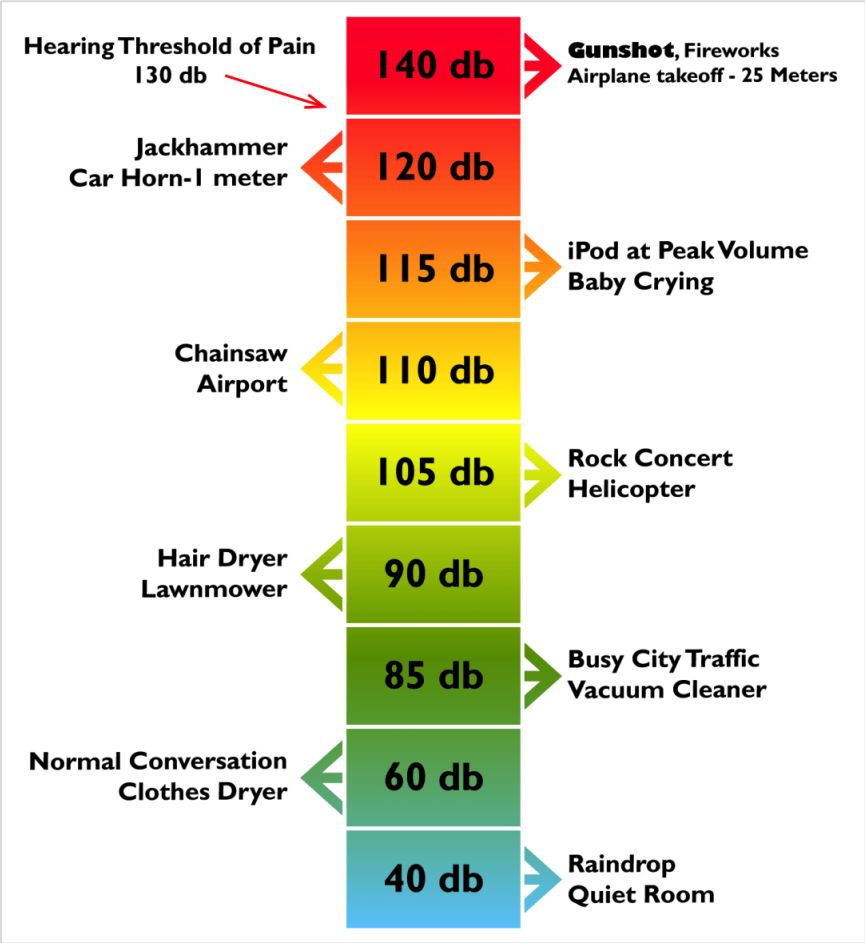

Figure 9 Common Noise Sources

4.2.4.1 Impacts and Mitigative Measures

Solar Facility

Construction Noise

Construction vehicles and equipment will emit intermittent noise, and thus limited by the NAC-1 L_{10} metric. The noise from construction activities will dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. Noise associated with construction will likely be perceptible at nearby residences. These noise impacts will be temporary, and the amount of noise will vary based on what type of construction is occurring on a given day. Sound levels from grading equipment are not dissimilar from the typical tractors and larger trucks used in agricultural communities during planting or harvest. Table 4-4 summarizes typical maximum and minimum sound pressure levels for construction equipment (reference (29))

Table 4-4 Typical Sound Levels from Construction Equipment

Equipment	Max Sound Pressure Level at 50 feet (dBA)
Excavator	85
Dozer	85
Grader	85
Roller	85
Dump Truck	84
Concrete Mixing Truck	85
Concrete Pumper Truck	82
Man-lift	85
Flatbed Truck	84
Large Crane	85
Small Crane	83
Compactor (Vibratory)	80

The most significant source of construction noise is the pile driving equipment associated with installation of the foundations for the solar array. Federal Highway Administration Construction guidance shows power hammer noise levels of approximately 90 dBA at 50 feet. Scaled out to daytime noise level limits, this corresponds to NAC-1 L_{10} compliant levels at approximately 800 feet.

During construction, Minnesota Power may limit the duration of foundations installation within that distance of a particular residence in any given hour or may elect to erect temporary mobile noise barriers adjacent to the installation operation to reduce impacts. As stated above, these noise impacts will be temporary, and Minnesota Power will limit construction to daytime operations as much as possible to minimize potential disturbances associated with construction equipment.

Operational Noise

The main sources of noise from the Project during operations will be from the panel rotation, transformers, and inverters. Panel tracking drives may produce limited duration noises as panel angles adjust throughout the day and reset to initial positions once a day. Panel tracking noises will be of limited duration such that they do not affect compliance with state standards. The type of noise from operation of the Project is not new for the general area (given the existing Boswell Substation) but will extend into areas that have not routinely experienced it in the past. The nearest residential receptor is Residence 48 (Table 4-2), situated approximately 48 feet from the nearest solar array. The noise level modeled at this residence is approximately 34 dBA, below the NAC-1 L_{50} nighttime limit of 50 dBA. The highest modeled impact is to Residence 38 (Table 4-2) at approximately 36 dBA, given its proximity to multiple inverters. This is also below the NAC-1 L_{50} nighttime limit of 50 dBA. Modeled impacts from the Project are below the state noise standards. Minnesota Power does not propose mitigative measures because it expects the Project will comply with the applicable noise limits.

Gen-Tie Line

The Gen-Tie Line may generate some minor noise in the form of corona (crackling) or from wind blowing through the conductors and structures. The type of noise from operation of the Project is not new for the general area (given the existing Boswell transmission infrastructure) but will extend into areas that have

not routinely experienced it in the past. Minnesota Power does not propose mitigative measures because it expects the Project will comply with the applicable noise limits.

4.2.5 Communication, Radio, and Television Interference

According to publicly available Federal Communications Commission sources, there are no Amplitude Modulation (AM), Frequency Modulation (FM), microwave, TV, or other broadcast transmission towers within the Site. There are 10 AM and 26 FM radio broadcasting stations that operate within the vicinity of the Project (reference (30)).

There are four local digital television channels in the Project vicinity (ABC, CBS, and PBS, NBC). The nearest tower with the strongest signal is in Hibbing, Minnesota (reference (31)).

There are no cellular towers in the Project, but two are nearby. One is around 2.6 miles northeast of Deer River, which is 5 miles northwest of the Site, and the other is around 1.7 miles northwest from Grand Rapids, which is around 6 miles from the Site (reference (32)). Several cellular phone service providers operate in the vicinity of the Project, including large carriers like AT&T, T-Mobile, and Verizon (reference (33)).

Electromagnetic interference (EMI) refers to the disturbance of electrical circuits or equipment caused by electromagnetic radiation emitted from external sources, in this case, high-voltage power lines. Overhead power lines generate electromagnetic fields depending on the distance from sources and the type of line configuration. The electromagnetic fields decrease as the distance increases from the tower and the conductors (reference (34)).

4.2.5.1 Impacts and Mitigative Measures

Solar Facility

The Site will have a low-profile nature (i.e., less than 20 feet). Given the heights of the anticipated structures, and the proximity to the nearby towers, Minnesota Power does not anticipate the Solar Facility will interfere with communication systems. As such, there will be no adverse impacts; therefore, Minnesota Power does not propose mitigative measures.

Gen-Tie Line

While generally, transmission lines do not cause interference with radio and television, there are three ways that transmission lines can impact electronic communications like radios, television, and microwave communications: corona noise, shadowing effect and gap discharge.

Corona from transmission line conductors can generate electromagnetic noise at the same frequencies that radio and television signals are transmitted. This generated noise typically occurs underneath a transmission line. It dissipates rapidly as the distance increases from the transmission line. Corona “noise” primarily occurs in the radio frequency range of AM signals, and FM radio receivers usually do not pick up interference from transmission (reference (35)).

Shadowing effect comes from physically blocking communication signals (reference (36)). This primarily can impact two-way mobile radio communications and television signals. While television interference is rare, it can happen when a structure is aligned between a receiver and a weak, distant signal.

Gap discharges are usually caused by hardware defects or abnormalities on a transmission or distribution line where there are small electrical gaps between metal parts. Sparks can discharge across the gap where they can create the potential for electrical noise, which can in turn cause interference with radio and television signals. Gap discharges are usually a maintenance issue, as they occur in areas where gaps have formed due to broken or ill-fitted hardware (reference (37)).

Minnesota Power does not expect the Gen-Tie Line to impact GPS from the construction or operation of the Project. Research has evaluated the potential for interference in the use GPS satellite-based microwave signals under or near power line conductors and indicates it is unlikely that there will be electronic interference while using GPS (reference (38)). Interference is more likely near a transmission line structure, and unlikely under a transmission line (reference (39)).

No impacts to electronic devices or due to EMI are anticipated; therefore, Minnesota Power does not propose mitigative measures.

4.2.6 Aesthetics

The Site is located adjacent to the existing Minnesota Power Boswell Energy Center. Land use in the Site is primarily agricultural, with wetlands and forested land with adjacent farmsteads, and township and county roads. There are no residents located within the Anticipated Development Area. However, there are 13 residences within 0.25-mile of the Site (Map 5), excluding those in the city of Cohasset (Table 4-5). The topography of the area is flat and gently rolling, and viewsheds in this area are typically broad, interrupted by farmsteads and their associated residences. The views in the Site vary and includes forest, wetlands, rivers, lakes, agricultural fields, and pastures. The adjacent residences are located within forests or are otherwise surrounded by trees.

Table 4-5 Summary of Residences Within 0.25 Miles of the Site

Residence ID	Distance from Residence to nearest solar array	Vegetative Screening
47	~ 300 feet	Extensive vegetation surrounding property to the north, consisting of deciduous trees, will likely screen residence from the Project, particularly in the summer months.
45	~ 400 feet	Consisting of a dwelling and several agricultural buildings. The residence appears to have some screening from shelter belts and the agricultural buildings.
41	~ 440 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, around the property will offer visual protection from the Project to the north. The solar arrays may be visible through a narrow corridor to the east.
38	~ 470 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, around the property will offer visual protection from the Project to the north and east.
48	~ 540 feet	Moderate vegetative screening, consisting of deciduous trees scattered around the property, will offer visual protection from the Project to the south/southwest.
42	~ 620 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, around the property will offer visual protection from the Project to the north.
18	~ 730 feet	Consisting of a dwelling and several agricultural buildings. The residence appears to have some screening from shelter belts and the agricultural buildings. The solar arrays may be visible to the north.
50	~ 1,200 feet	Moderate vegetative screening, consisting of deciduous trees scattered around the property, will offer visual protection from the Project to the south.
43	~ 1,210 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, around the property will offer visual protection from the Project to the east.
51	~ 1,300 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, to the south and west of the property will offer visual protection from the Project to the east.
40	~ 1,300 feet	Extensive vegetative screening, consisting of densely packed deciduous trees and shrubs, around the property will offer visual protection from the Project to the northeast.
49	~1,700 feet	This property, consisting of a dwelling and associated structures, contains some vegetative screening to the south of County Road 251. Solar arrays will likely not be visible given the distance to the Project.
16	~ 1,900 feet	Extensive vegetative screening, consisting of densely packed deciduous trees, are located around the solar arrays at this location. Solar arrays will likely not be visible given the distance to the Project.

4.2.6.1 Impacts and Mitigative Measures

Solar Facility

The Project will alter the current viewshed by converting the agricultural use of the lands. The Anticipated Development Area will be visible from nearby residences and nearby roadways. Minnesota Power designed the Project to avoid tree clearing to the extent practicable, which will help to screen the arrays in some areas. In addition, existing tree cover will screen the arrays from recreational users of the

Mississippi River. Minnesota Power prepared the following visual renderings to illustrate anticipated viewsheds after construction of the Project at four locations (Map 6).

The solar panels will take up most of the Anticipated Development Area and along with the fencing, will be the most prominent visible Project component. Given their low profile, the arrays and fencing will be notably less visible from longer distances. Perennial vegetation between the solar panels will also be visible.

PV solar panels use dark, anti-reflective glass panels designed to absorb sunlight to produce electricity. PV solar modules can absorb up to 98 percent of the incoming sunlight depending on the angle of the sun, glass texture and use of anti-reflective coatings. Therefore, during operation there will be little glare from the PV solar modules.

The Project substation may impact the viewsheds beyond the solar panels. However, the addition of the Project substation and is not likely to significantly alter the viewshed or increase visual impacts.

Operational lighting is necessary along the perimeter fencing and at entrances/exits for safety and security. However, Minnesota Power will minimize lighting using motion activated, down lit lights, facing away from neighboring properties.

Visual Rendering Location 1 Existing Viewshed

Visual Rendering Location 1 Visual Rendering

Visual Rendering Location 2 Existing Viewshed

Visual Rendering Location 2 Visual Rendering

Visual Rendering Location 3a Existing Viewshed

Visual Rendering Location 3a Visual Rendering

Visual Rendering Location 3b Existing Viewshed

Visual Rendering Location 3b Visual Rendering

Visual Rendering Location 4a Existing Viewshed

Visual Rendering Location 4a Visual Rendering

Visual Rendering Location 4c Existing Viewshed

Visual Rendering Location 4c Visual Rendering

Gen-Tie Line

The Gen-Tie Line will alter the current viewshed by converting some of the agricultural and forest land. The Gen-Tie Line will be approximately 2.45 miles of new 230 kV line that will connect the proposed Solar Project to the existing Minnesota Power, Boswell Energy Center substation. The Proposed Route and ROW anticipates using a 130-foot ROW for the entire length of the line and is located entirely on Minnesota Power property. The height of the Gen-Tie Line steel structures will be up to 140 feet tall.

The new 230 kV line will be designed and built to be double-circuit ready along the east-west segment, and single-circuit connecting to substations at each end. The line will originate from the proposed Project Substation located just South of the Minnesota Power road in Itasca County. For approximately 0.8 miles the line is within the Solar Facility and travels east through agricultural fields and forest. As the line travels east outside of the Solar Facility, it parallels Minnesota Power Road. North of the road there are infrastructure facilities that support the Boswell Energy Center on Minnesota Power property. The line then turns south to connect to the existing Boswell Energy Center 230 kV substation.

The Gen-Tie Line may impact the viewshed by altering or clearing some of the forest land. However, the Gen-Tie Line is not likely to significantly alter the viewshed or increase visual impacts due to existing mostly industrial land uses of the Gen-Tie Line and surrounding areas.

4.2.7 Socioeconomics

The Project is in Itasca County, which is part of the Economic Development Region 3 and in the Northeast Planning Region. Socioeconomic data analyzed throughout Section 4.2.7 focuses heavily on Itasca County as a whole, with some comparisons to the municipalities and reservation within the Project: The city of Cohasset, Deer Lake Unorganized Territory (UT) and LLBO reservation. Solar projects can impact the socioeconomic conditions of an area in the short term through:

- creation of construction jobs
- construction material and other purchases from local businesses
- expenditures on temporary housing for non-local personnel

4.2.7.1 Population

Table 4-6 details population and race characteristics for the LLBO reservation, Deer Lake UT, city of Cohasset, Itasca County and Minnesota from the 2022 American Community 5-year Survey. The population density of the County, Deer Lake UT, and LLBO reservation are all well below that of the overall State of Minnesota. While the city of Cohasset has a slightly higher population density than Minnesota, all the municipalities show overall rural landscapes. According to the Minnesota Department of Employment and Economic Development (DEED), Itasca County's population has increased 0.8% (351 people) from 2020 to 2023. This increase in population comes from an in-migration from domestic and international people, versus an increase in the population that lived in Itasca County. The median age of Itasca County is higher than the State (46.8 years and 38.5 years, respectively), with a larger percentage of the population being 65 or older (reference (40)).

Table 4-6 Population Characteristics

Location	Total Population	Population Density (persons per sq. mile)
Minnesota (1)	5,695,292	67.5
Itasca County (2)	45,054	15.4
City of Cohasset (3)	2,683	76.0
Deer Lake UT (4)	3,636	0.9
LLBO Reservation (5)	11,189	8.5

(1) Source: reference (41)
(2) Source: reference (42)
(3) Source: reference (3)
(4) Source: reference (4)
(5) Source: reference (5)

4.2.7.2 Housing

According to the 2020 Decennial Census (DEC) Redistricting Data, there were 174 vacant housing units in the city of Cohasset (Table 4-7). In Deer Lake UT and generally in Itasca County there are numerous vacant housing units. When considering the total number of households, there is adequate housing available in Deer Lake UT, LLBO reservation, city of Cohasset, and Itasca County. According to DEED, the cost of living increased from 2018 to 2022 in many areas, but Itasca County has a lower cost of living than the State as a whole (reference (40)).

Table 4-7 Housing Characteristics

Category	Total Households	Total Housing Units	Total Occupied Housing Units	Total Vacant Housing Units
Minnesota (1)	2,322,190	2,485,558	2,253,990	231,568
Itasca County (2)	19.529	25,595	18,121	6,407
City of Cohasset (3)	1,076	1,264	1,090	174
Deer Lake UT (4)	1,411	2,373	1,522	851
LLBO Reservation (5)	3,996	7,229	4,226	3,003

(1) Source: references (43); (44); (45)
(2) Source: references (46); (47)
(3) Source: references (48); (49)
(4) Source: references (50); (51)
(5) Source: references (52); (53)

4.2.7.3 Employment and Income

Table 4-8 provides income, poverty, and employment levels from the 2022 American Community Survey 5-year Estimates. Itasca County, city of Cohasset, and Deer Lake UT all have a higher unemployment rate than the state of Minnesota. The LLBO reservation and Deer Lake UT have a significantly higher unemployment rate than any of the other areas. Itasca County and LLBO reservation have higher percentages of the population (11.8 and 20.8 percent, respectively) below the poverty level than the State.

According to the 2022 American Community Survey 5-year Estimates, the three largest occupational categories in Itasca County's population are:

- Management, business, science, and arts occupations (33.7 percent),
- Sales and office occupations (20.0 percent), and
- Service Occupations (18.9 percent) (reference (40)).

The three largest occupational categories in the city of Cohasset's are:

- Management, business, science, and arts occupations (42.7%),
- Sales and office occupations (19.0%), and
- Service Occupations (16.3%) (reference (54)).

The industry employment statistics, which reflects the business activity of the employer or company, show that the top three industry jobs in Itasca County are:

- Educational services, and health care and social assistance (27.1 percent),
- Retail Trade (13.8 percent), and
- Manufacturing (9.5 percent) (reference (40)).

The three largest industry employment categories for the city of Cohasset are:

- Educational services, and health care and social assistance (37.1 percent),
- Transportation and warehousing, and utilities (11.6 percent), and
- Retail Trade (8.8 percent) (reference (54)).

Table 4-8 Income and Poverty

Category	Per Capita Income($)	Unemployment Rate (population over 16 years) (%)	Persons Living Below Poverty Level (%)
Minnesota	44,947	2.7	9.3
Itasca County	34,528	3.4	11.8
City of Cohasset	43,281	4.73	5.4
Deer Lake UT	41,320	5.8	5.3
LLBO Reservation	29,256	5.9	20.8

(1) Source: reference (55)
(2) Source: reference (56)
(3) Source: reference (54)
(4) Source: reference (57)
(5) Source: reference (58)

4.2.7.4 Impacts and Mitigative Measures

The Project will result in socioeconomic benefits to participating landowners, local governments, and communities. The Project will support up to 125 jobs during the construction and installation phases, and around 2 to 3 permanent fulltime jobs during operations. Construction of the Project will provide a temporary increase in revenue to local businesses, due to an increased demand for lodging, food

services, fuel, transportation, and general supplies. There are limited restaurants and temporary lodging in the immediate vicinity of the Project. Therefore, temporary construction workers may need to travel to nearby hotels and restaurants in the city of Deer River and Grand Rapids, as the city of Cohasset has only one restaurant and no lodging within the city limits. There is adequate housing in the county for operational employees, if needed.

Minnesota Power anticipates paying construction workers in accordance with the prevailing wage and apprenticeship rules under the Inflation Reduction Act. Lease agreement payments and purchase option payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. Additionally, Minnesota Power has strong relationships with the Building Trades and is committed to working with organized labor on the Project, including paying prevailing wages for applicable positions for the construction of the Project, The Project will generate an estimated $319,000 average annual solar energy production and property tax revenue over the life of the Project. These figures may increase or decrease as real property taxes are dependent on assessed value and local jurisdiction budgeting. Based on these positive socioeconomic impacts, Minnesota Power does not propose additional mitigative measures.

4.2.8 Environmental Justice

Environmental justice (EJ) refers to the fair treatment and meaningful involvement of communities of color, Indigenous communities, and low-income communities (reference (59)). In general, the intent of EJ is to hold that all people benefit from equal levels of environmental protections and have the same opportunities to participate in decisions that may affect their environment or health. Minority and low-income communities may constitute a very small percentage of the total population and/or geographical area.

The MPCA maintains the Minnesota Areas of Environmental Justice Concern Interactive map, which identifies areas of EJ concerns within the state of Minnesota (reference (60)). This tool has data at the census tract level for environmental and socioeconomic factors related to EJ. The MPCA uses U.S. Census tract data to prepare the mapping.

Minn. Stat. § 216B.1691, Subd. 1(e) defines an environmental justice as an area in Minnesota that, based on the most recent data published by the U.S. Census Bureau, meets one or more of the following criteria:

- 40 percent or more of the population is nonwhite
- 35 percent or more of the households have an income at or below 200 percent of the federal poverty level
- 40 percent or more of the population over the age of five has limited English proficiency
- Within Indian Country, as defined under United States Code, title 18, section 1151

The Project is in census tracts 4807 and 9400. Table 4-9 details the data from the MPCA EJ Screening Tool Website (reference (60)). A portion of the Solar Facility is within the exterior boundaries of a federally recognized tribal reservation/community, the LLBO reservation.

Table 4-9 Environmental Justice Data for Census Tracts

Location	Population[1]	Percent Limited English Speaking (margin of error)	Percent Below 200 Percent of Federal Poverty Level (margin of error)	Percent People of Color (margin of error)
Census Tract 4807	3,831	0.34 (+/- 0.53%)	26.81 (+/- 13.83%)	12.12 (+/- 4.57%)
Census Tract 9400	2,634	0.20 (+/- 0.23%)	35.97 (+/- 9.31%)	36.04 (+/- 5.32%)
Itasca County	45,054	0.2 (+/- 0.2%)	30.2 (+/- 1.9%)	10.5 (+/- 0.6%)
Minnesota	5,695,292	2.2 (+/- 0.1%)	22.5 (+/- 0.1%)	22.5 (+/- 0.1%)

[1] The population data that is used in the MPCA Environmental Justice Mapping tool is taken from the 2017-2021 American Community 5-year Survey.

4.2.8.1 Impacts and Mitigative Measures

Based on data, the Project is within EJ communities as defined by Minn. Stat. § 216B.1691, subd. 1(e). The data provided by the U.S. Census Bureau and the MPCA shows that the census tracts have EJ community considerations. Census tract 9400 reaches the 35 percent threshold, and therefore is considered an EJ community with low-income considerations. Census tract 4807 has low-income population considerations by MPCA standards when the margin of error (+/- 13.83 percent) is included with the total percentage of 26.81. In census tract 9400, 36.04 of their population are people of color and with the margin of error (+/- 5.32) the population reaches the 40 percent MPCA EJ consideration threshold. Portions of the Site are within a federally recognized tribal community, the LLBO reservation.

The U.S. Environmental Protection Agency's Climate and Economic Justice Screening Tool (CEJST) is an interactive mapping tool that can be used to identify disadvantage communities that are marginalized by underinvestment, overburdened by pollution or within the boundaries of a Federally Recognized Tribe (reference (61)). According to the EPA's EJScreen Community Report for census tract 9400 (reference (62)) there are no environmental burden indicators. The flood risk is 11 percent, which is three percent above the state average of 8 percent. There are no significant climate indicators. This census tract is considered to have a transportation access burden and to be a food desert. According to the EPA's EJScreen Community Report for census tract 4807 (reference (62)) there are no environmental burden indictors or climate indicators. This census tract is also considered a transportation access burdened area and a food desert. While construction of the Project will temporarily increase traffic in the area, the majority of the Project area is outside of this census tract and no permanent impacts are anticipated. The Project will not impact the fact that both census tracts are located in a food desert.

Minnesota Power does not anticipate adverse, disproportionate impacts to EJ communities resulting from the Project. Instead, as discussed in Section 4.2.7, the Project will have positive socioeconomic impacts. Likewise, as discussed in Section 4.5.1 and 4.6, the Project is not likely to impact air quality and will have positive impacts related to climate change. These long-term positive climate impacts come from the Project offsetting the cession of coal operations at the Boswell Energy Center Unit 3 by December 31, 2029, and Boswell Unit 4 by 2035. Under its *EnergyForward* resource strategy, Minnesota Power is delivering 50 percent renewable energy to customers and is committed to achieving an 80 percent reduction in carbon emissions by 2035 compared to 2005 levels. Minnesota Power also outlined a goal of delivering 100 percent carbon-free energy by 2050 (reference (63)).

Coordination with the LLBO is ongoing and further discussed in Section 5. Therefore, Minnesota Power does not propose additional mitigative measures.

4.2.9 Cultural Values

Cultural values include those perceived community attitudes or beliefs that provide a framework for community unity. Within the surrounding area of the Project there is an abundance of lakes, rivers, forests, and farms. Itasca County was one of the original 9 counties in Minnesota (reference (64)). The economy has historically been driven by timber harvesting, mining, and tourism. The Itasca County Historical Society is in Grand Rapids, Minnesota, and contains historical information about the Mississippi River, Blandin Paper Company, Charles Smith Chippewa Indian Legacy, Wild Ricing, and exhibits about Judy Garland (reference (65)). Itasca County hosts a fair in Grand Rapids, MN each year in mid-August, and various small community events throughout the year (reference (66)).

The Itasca County Comprehensive Land Use Plan (reference (67)) details the goals, objectives, and implementation tools for the County and local governments. The comprehensive plan states that the County Government will "strive to preserve and enhance the quality of life, the environment and economic well-being within the community." The comprehensive plan has a total of eight land use goals, that have several objectives and implementation tools, methods, and techniques:

- Cooperation
- Measurability
- Natural Resources
- Housing and Settlement Patterns
- Agriculture
- Commercial/Industrial
- Recreation
- Transportation

The portion of the Site within the city of Cohasset is outside the Chippewa National Forest. The Ojibwe called the city "Ushigunikan" which means "the place of bass". The area was prominently a lumber camp in the early years. It has been, and continues to be, a popular summer vacation destination due to its natural environment (reference (68)). The city of Cohasset's community vision and guiding principles state that they "will maintain its North Country character by carefully growing and diversifying its economic base while maintaining its lake and waterfront appeal." Cohasset emphasizes investment in and protection of the desirability of the area due to its rural and environmental character.

Prior to settlers arriving to the to the Leech Lake area it was untouched land covered by red and white pine and cared for by the Ojibwe peoples. The Project is within the 1855 Treaty boundaries, also known as the Treaty of Washington. It was signed between the U.S. government and representatives of the Pillager, Lake Winnibigoshish and Mississippi bands of Ojibwe. A reservation at Leech Lake for the Pillager and Lake Winnibigoshish Bands and a reservation at Mille Lacs for the Mississippi Bands were established. The Ojibwe culture has many long-standing traditions which are still honored today. The LLBO hosts Powwows, a space for those to gather and make moccasins, herbal events, and various walks to bring awareness to illnesses. Some of these events are available to the public, while others are only open to LLBO members (reference (69)). The LLBO consider wild rice a sacred being. The Site is near White Oak Lake and Little White Oak Lake, which have wild rice beds (reference (70)). The LLBO

values actions to combat climate change, mentioning composting, buying wind power, reducing energy consumption and recycling (reference (71)). They are part of the Minnesota GreenStep Cities Program (reference (72)) and have committed to creating a more sustainable a climate friendly community, which includes supporting renewable energy sources (reference (73)).

4.2.9.1 Impacts and Mitigative Measures

The Project helps to support the "Sustainable Building" as part of one of the Commercial/Industrial Goals stated in the Itasca County Comprehensive Land Use Plan, under "Asset Quality Objective – Encourage economic development that sustains the quality of the natural resources of Itasca County." This goal encourages "new commercial development and renovation projects to incorporate 'green building' practices that reduce adverse impacts on human health and the environment, including renewable energy sources and recycled building materials" (reference (67))."

The city of Cohasset wants to maintain its rural character and environmental desirability, while increasing investments in the community. In their community vision and guiding principles, they state a way to achieve this is by growing the commercial tax base in ways that have a positive return on investment. The Project can help support this due to job creation and increase in clean energy and tax payouts.

Construction and operation of the Project will not impact public participation in the regional community cultural events described above. It will not block or impact wild rice waters in the area and therefore will not affect harvesting or production of wild rice. The Project will not cause adverse impacts to cultural values in the area; therefore, Minnesota Power does not propose mitigative measures.

4.2.10 Recreation

Itasca County provides a variety of recreational opportunities such as hiking, fishing, hunting, camping, snowmobiling, cross country skiing and nature viewing. Public lands often provide opportunities for recreational activities. There are no public lands within the Project. However, there are public opportunities for recreational activities surrounding the Project. These include:

- Upper Mississippi River – Grand Rapids watershed is considered a state water trail and borders the Site. 2 miles of the Mississippi River run parallel with the southern border of the Site. Almost half of the area in the Grand Rapids watershed is public land. The watershed covers 2,092 square miles and includes the cities of Grand Rapids, Nashwauk, Coleraine, Hill City, McGregor, Remer, and Cromwell (reference (74)).
- Little Drum Lake, 0.24 miles from the boarder of the Site, does not have a public access (reference (75)).
- Little Rice Lake, 0.30 miles from the boarder of the Site does not have a public access. However, the lake is noted to have black bullhead, black crappie, bluegill, brown bullhead, largemouth bass, northern pile, pumpkinseed, rock bass, tullibee, walleye, yellow bullhead, yellow perch, bowfin, white sucker (reference (75)).
- Snells Lake Public Water Access (PWA) on Guile Lake, also known as Snells Lake, is 0.50 miles from the border of the Site (reference (76)). The lake is noted to have black crappie, bluegill, brown bullhead, largemouth bass, northern pile, pumpkinseed, walleye, yellow bullhead, yellow perch, bowfin (reference (75)).

- Little White Oak Lake PWA, on Little White Oak Lake, is 0.7 miles from the boarder of the Site, has one ramp, one gravel parking lot, but no dock (reference (76)).

- The Clay Boswell PWA Site is around 1.94 miles east of the Project. It is on Jay Gould Lake and is the closest PWA to the Project where you can enter the Mississippi River (reference (77)). Bass Brook Wildlife Management Area is more than one mile to the east of the Project. WMAs are established to protect lands and waters that have higher potential for wildlife production, public hunting, trapping, and fishing (reference (78)). The Bass Brook WMA in Grand Rapids is a 313 acre area within the cite of Cohasset limits. The area provides great birding opportunities but has restrictions on firearm hunting and trapping. However, it is still open for archery hunting. The primary game species in this area is the White-Tail Deer (reference (79)).

Within the city of Cohasset, there is a softball field 3.6 miles southeast of the project and a school with a playground as well as a free campground adjacent to the Mississippi River 3 miles from the Project. There are no snowmobile trails within the Project. There is a snowmobile trail north of the Site running parallel to Highway 2 that is one mile away.

4.2.10.1 Impacts and Mitigative Measures

Construction and operation of the Project is not likely to impact public access to, or enjoyment of, nearby recreational opportunities. Water bodies with recreational opportunities are outside of the Project and access will not change during construction or operations. Construction might cause temporary noise in the area, which could affect local hunting opportunities. These affects will be minimal and temporary. The Project will not cause adverse impacts to recreation in the area; therefore, Minnesota Power does not propose mitigative measures.

4.2.11 Conservation Easements

Conservation easements are properties that are sold or donated by a landowner to state, federal, or non-governmental organizations in perpetuity to meet conservation objectives. The Project avoids lands in conservation programs or with conservation easements such as the Conservation Reserve Enhancement Program (CREP) and Conservation Reserve Program (CRP) (Map 7). A Reinvest in Minnesota (RIM) is more than one mile west of the Site.

The CREP is an offshoot of the CRP, a land conservation program established by the U.S. Department of Agriculture (USDA) and administered by the Farm Service Agency. The program pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production to improve environmental health and quality (reference (80)). The same land is also enrolled into a state-funded perpetual conservation easement through the RIM Reserve program, administered by the Minnesota Board of Water and Soil Resources (BWSR).

Minnesota implemented the CREP to target high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land. Lands within the RIM remain private while advancing the state's efforts to improve water quality by reducing soil erosion, and phosphorus and nitrogen loading, and improving wildlife habitat and flood attenuation (reference (81)). Enrollment is voluntary and participation in the program comes with certain restrictions on the types of development allowed on parcels enrolled in the program if such development is inconsistent with the conservation goals of the program.

4.2.11.1 Impacts and Mitigative Measures

No CRP, CREP, or RIM parcels are within the Project. The closest conservation easement is more than one mile west of the Project. Minnesota Power does not anticipate direct impacts to these conservation easements. Minnesota Power will develop a SWPPP for the Project that outlines erosion and sediment control measures necessary during construction to minimize the potential for sedimentation to sensitive resources. The Project will not cause adverse impacts to conservation easements in the area; therefore, Minnesota Power does not propose mitigative measures.

4.2.12 Public Service and Infrastructure

Public services are those typically provided by a government entity to its citizens to benefit public health and safety. Publicly available services and infrastructure in the vicinity of the Project include emergency response, roadways, sewage and water, solid waste disposal, and utilities. Section 4.2.1 summarizes Emergency services and Section 4.2.14 summarizes public roads.

In Itasca County, most rural residences have water supply wells. The city of Cohasset provides gas, water, and sanitary services within the municipality. Most residences in rural areas throughout the Site have private septic systems and/or drain fields.

Minnesota Power and Lake Country Power are the main electric service providers within the Site and its surrounding area (reference (82)). Minnesota Power owns the existing 115 kV transmission line north and east of the Project (Map 8). As noted on Map 8, there are no known pipelines within the Site or Gen-Tie Line route.

4.2.12.1 Impacts and Mitigative Measures

Minnesota Power will use water and sewer at their existing Boswell Energy Center and will not require any additional utilities during Project operations. A new water well may be required if sheep are used for vegetation management. The Project will generate solid waste during construction. The contractor will manage and dispose of solid waste according to applicable requirements.

Minnesota Power will coordinate with Gopher State One Call before and during construction to confirm buried utility locations. Final Project design will avoid impacts to overhead utilities. Limited, temporary impacts to electrical service may be unavoidable during interconnection; however, these impacts will be short-term, and Minnesota Power will coordinate with local individuals and utilities prior to any temporary shutdowns.

The Project will not result in permanent impacts to public services and infrastructure; therefore, Minnesota Power does not propose mitigative measures.

4.2.13 Zoning and Land Use

The primary regulatory approvals required for the construction and operation of the Project are Site and Route Permits issued by the Commission. Pursuant to Minn. Stat. § 216E.10, a Site or Route Permit “supersedes and preempts all zoning, building or land use rules, regulations or ordinances adopted by regional, county, local and special purpose governments.” Therefore, Minnesota Power does not require approvals from local zoning authorities. Nonetheless, Minnesota Power considered local zoning ordinances in designing the Project where practicable. At the Project is within Itasca County and city of Cohasset, Deer Lake UT, and the LLBO reservation.

Table 4-10 provides a summary of governing bodies within and adjacent to the Project and their respective comprehensive plans.

Table 4-10 Site Local Government Units

Governing Body	Name of Plan	Year Adopted	Associated Development Plans
Itasca County	Zoning Ordinance for Itasca County, Minnesota	September 1998	Itasca County Comprehensive Land Use Plan
City of Cohasset	City of Cohasset Land Use Controls Ordinance	June 1992	Cohasset City Comprehensive Plan
LLBO Reservation	None	N/A	N/A
Deer Lake Unorganized Territory	N/A	N/A	Itasca County Comprehensive Plan

Based on the Itasca County Zoning Map (reference (83)), the zoning classification within the Project outside of the city of Cohasset and in the Deer Lake Unorganized Territory is Farm Residential (Map 9). Deer Lake UT does not have a comprehensive plan or zoning ordinance plan, so they are under the Itasca County Comprehensive Plan and Zoning Ordinance. The Farm Residential Zoning District's purpose is generally to protect and promote rural living, farming, and forestry in Itasca County (reference (84)). Transmission Lines are considered an essential service, and a permitted use in all zoning districts. Most parcels nearby are also zone Farm Residential, with some zoned Public. The Project will not interfere with future land use plans for Itasca County (reference (67)).

Table 4-11 provides a summary of Itasca County's setback requirements for the Farm Residential zoning district and the city of Cohasset's Heavy Industrial zoning district.

Table 4-11 Itasca County and City of Cohasset Setbacks

Setback Category	Itasca County Accessory building setback	City of Cohasset County
Road ROW	68 feet from centerline or 35 from ROW, whichever distance is greater.	68 feet from centerline or 35 from ROW, whichever distance is greater.
Side Yard Property Line	10 feet	15 feet
Rear Yard Property Line	10 feet	15 feet

The city of Cohasset zoning map (reference (85)) shows that the portion of the Project that is within its boundaries is in the Heavy Industrial Zoning District. The purpose of the Heavy Industry District is to "promote and protect areas for the full range of industrial enterprises specifically those which might have significant impacts on off-site properties and uses" (reference (86)). Electrical power generation is a permitted use in the heavy industrial district according to the city of Cohasset zoning ordinance. Transmission lines, electrical transformers and substations are considered "minor utility structures" and are considered a permitted use in all zoning districts.

The Site falls within city shoreland areas lying within 1,000 feet of the ordinary high-water line for lakes and 300 feet (and all land within the 100-year floodplain) for rivers (reference (87)). Despite the Site falling within the shoreland and floodplain areas, the anticipated development area does not encroach into this area. The city of Cohasset does not have any provisions relating to commercial solar systems.

The land use map within the comprehensive plan shows that the Project is in Agricultural & Timber areas, and there are no public lands within the Project. The future land use map changes those areas and classifies them as industrial and Commercial and as the preferred future use as the area. One of the policies or action steps for this land use area is to "Encourage new investment in clean energy generation at Clay-Boswell and work with Minnesota Power to create opportunities for spin off industry, such as light industry and non-industrial commercial enterprises, on the Minnesota Power land" (reference (87)). The future land use also shows the shoreland areas on its map, which policies and action steps are to protect, retain, and enhance these shoreline and water areas.

Portions of the Site are within District One of the LLBO reservation (reference (88)). The LLBO has numerous ordinances (reference (89)) related to cultural resources, licensing, wild rice, harvesting, burning and more. Outside of these ordinances, there is no formal adopted comprehensive plan or zoning ordinance document.

4.2.13.1 Impacts and Mitigative Measures

Solar Facility

The layout for the Site is consistent with both the Itasca County and city of Cohasset zoning ordinance and comprehensive plan. The location of the Site will not limit the existing land uses of the surrounding parcels or areas. The anticipated development area will avoid the floodplain and shoreland areas, while also conforming with existing zoning districts. The LLBO reservation does not currently have a formal adopted comprehensive plan or zoning ordinance. As mentioned in Section 4.2.9, LLBO is a GreenStep City and therefore holds sustainability and climate forward values. The overall purpose of the Project aligns with the climate forward strategy to reduce carbon emissions and deliver carbon-free energy. There are no anticipated impacts to zoning or land use; therefore, Minnesota Power does not propose mitigative measures.

Gen-Tie Line

The Gen-Tie Line is only in the city of Cohasset. The Gen-Tie Line is defined as a "minor utility structure" in the city of Cohasset Zoning Ordinance and is a permitted use in the Heavy Industrial zoning district. However, the Gen-Tie line crosses a Public Waters Basin and the 100-year flood plain close to the existing Boswell Substation. In these cases, the Cohasset Zoning Ordinance requires that transmission lines have a conditional use permit, provided that the uses are also permitted in the underlying zoning district. Because a Route Permit supersedes the local zoning and permitting, this is not a requirement of the Project. There are no anticipated impacts to zoning or land use; therefore, Minnesota Power does not propose mitigative measures.

4.2.14 Transportation

Transportation resources within and near the Site include several county roads and a State highway (Map 8). Roads adjacent to or bisecting the Site include:

- County Road (CR) 249 which runs east to west along a portion of the center of the Site on the west side
- County Road (CR) 251 runs North to South then West to East through the northern most portion of the Site
- Minnesota State Highway 6 runs north to south directly west of the Site

- County Road (CR) 269 enters a portion of the Site on the southern boundary

Table 4-12 summarizes the Average Annual Daily Traffic (AADT) counts based on the Minnesota Department of Transportation (DOT) Traffic Mapping Application (reference (90)). AADT counts are not available for township roads.

Table 4-12 Average Annual Daily Traffic Within or Adjacent to the Site

Roadway	Year	AADT Traffic Volume Total
County Road 249	2013	35
County Road 251	2013	25
County Road 269	2013	20
State Highway 6	2023	409

4.2.14.1 Railroads

The closest railroad runs east to west just north of the Project, parallelling Highway 2. The railway breaks off the main track running east to west, and goes south, crossing the Gen-Tie Line (Map 8). The primary operating railroad and track owner is Burlington Northern Santa Fe (BNSF) Railway Company (reference (91)).

4.2.14.2 Airports

There are no Federal Aviation Administration (FAA)-registered airports within 5 miles of the Project. The closest airport to the Project is the Grand Rapids/Itasca County Airport (8.7 miles west). No private airstrips are within 5 miles of the Project.

4.2.14.3 Impacts and Mitigative Measures

Solar Facility

Minnesota Power will secure the appropriate local permits for road access and other aspects of the Project. Coordination with the appropriate road authority will happen for planned work within the road rights-of-way to support the Project utility installation. Minnesota Power is not proposing changes to existing roadways. Access to the Project will be from existing state, county, and township roads, with the possibility of minor field access. A traffic control plan will be developed prior to start of construction.

The Project will temporarily impact public roadways during construction. The impacts primarily result from additional traffic and the potential for slow-moving construction vehicles. Slow-moving vehicles during construction have the potential to cause some delays but will be minimal and in a relatively short period of time. The number of vehicles travelling to and from the construction site per day will fluctuate throughout the construction period. During peak construction, there could be up to 120 people at the Site. Traffic during active construction will consist of an average of around 60-120 vehicle traffic per day, which will include deliveries and worker transportation. Delivery and worker transportation will vary depending on phase of construction and delivery timeline of equipment. While construction will create an increase in local traffic, the increase will not have an impact on the functional capacity of the local roads. The functional capacity of a two-lane paved rural highway is more than 5,000 vehicles per day; therefore, the surrounding roads will continue to be well below capacity (reference (92)). Finally, as noted in Section 3.6, Minnesota Power will work with Itasca County and the city of Cohasset to develop a traffic

control plan prior to construction to minimize the impact of vehicular traffic on the local area. This traffic control plan will include anticipated temporary road closures and signage coordination.

If overweight or oversize loads are necessary, Minnesota Power will obtain the appropriate approvals prior to construction. Construction equipment movement on or across roads will be minimized and conducted in accordance with DOT requirements. Once construction is complete, traffic impacts will be negligible. During the operations phase a small maintenance crew will use pickup trucks on a regular basis to monitor and maintain the facilities.

Gen-Tie Line

The Gen-Tie Line will cross Minnesota Power's Boswell Energy Center rail spur. The rail spur connects the facility to the BNSF railroad north of the Project. Communication with the railroad is ongoing and construction will be coordinated appropriately. If required, Minnesota Power will obtain a crossing license from BNSF for the Gen-Tie Line.

Minnesota Power used the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) Notice Criteria Tool to determine if further aeronautical study or FAA filing is necessary. The tool generated a "no notice required" result for the solar panels, construction cranes up to 150 ft, electric transmission poles/towers up to 150 ft, or communications towers up to 150 ft. Although unlikely, Minnesota Power will determine closer to construction if cranes taller than 150 feet are necessary that require filing with the FAA. As a result, no 7460-1 forms are anticipated to be necessary for the Project (reference (93)).

4.3 Land-Based Economies

This section describes the land-based economies and the potential impacts of the Project on land-based economies, including agriculture, forestry, tourism, and mining.

4.3.1 Agriculture

Less than five percent of Itasca County contains farmland (71,710 farmland acres); therefore, agricultural is not a prominent land use in the county. Less than 250 jobs, or less than 1 percent of all jobs in Itasca County, are in the "farming, fishing, and forestry" industry as of Quarter 1 2024 (reference (40)). According to the 2017 US Census of Agriculture (reference (94)), there were a total of 337 individual farms in Itasca County with an average farm size of 213 acres in 2017. The market value of agricultural products sold in Itasca County was approximately 8 million dollars that year. Based on agricultural sales data for Itasca County in 2017, 65 percent of sales were for crops and 35 percent of sales were for livestock, poultry, and products. Crop sales included grains, oilseeds, dry beans, dry peas, and hay. Livestock and poultry sales primarily included cattle and calves but also poultry and eggs, hogs and pigs, sheep and goats, and horses (reference (94)). Based on the 2023 cropland data layer provided by the United States Department of Agriculture, crops grown at the Site included soybeans, spring wheat, corn, and alfalfa; grassland/pasture was also present (Map 11).

4.3.1.1 Impacts and Mitigative Measures

Solar Facility

The Project will temporarily impact up to 652.4 acres of agricultural land within the Site during construction and operations. This constitutes 0.91 percent of the agricultural land in Itasca County. The revenue lost from removing some of the land from agricultural production will be offset by leases with the

landowners. Minnesota Power conducted a Prime Farmland Analysis to demonstrate the absence of a feasible and prudent alternative to the Project (Appendix E). Furthermore, Minnesota Power prepared an AIMP (Appendix D) and a VMP (Appendix F) to minimize Project impacts such as soil compaction, topsoil mixing, soil erosion, invasive and noxious weed species, and rutting.

Gen-Tie Line

The Project will temporarily impact up to 34.0 acres of agricultural land within the Gen-Tie Line corridor during construction and operations. Minnesota Power owns this agricultural land and constitutes 0.05 percent of the agricultural land in Itasca County. As stated above, Minnesota Power prepared an AIMP (Appendix D) and a VMP (Appendix F) to minimize Project impacts.

4.3.2 Forestry

There are no forestry operations in the Project. Section 4.5.6 discusses the wooded areas present.

4.3.2.1 Impacts and Mitigative Measures

The Project will not impact forestry land-based economies; therefore, Minnesota Power does not propose mitigative measures.

4.3.3 Tourism

Solar projects have the potential to impact tourism through aesthetic changes to the existing landscape or interruption of public access to nearby recreational and tourism opportunities. Tourism in the Project vicinity primarily centers around outdoor recreational opportunities, as described in Section 4.2.10, and various community festivals and events.

Within a five-mile radius of the Project, the following attractions are available for tourist:

- Blueberry Hills Golf Course
- Sunset Reins Equine Center
- Schoolcraft State Park
- White Oak Casino
- several lake resorts
- walking and mountain bike trails

The Blueberry Hills Golf Course, 6 miles northwest of the Project, offers monthly tournaments, a 28-site campground, and kayaking on the Deer River. In addition, the White Oak Casino, owned and operated by the LLBO, is approximately 5 miles to the northwest of the Project.

Community events in the area are hosted by nearby municipalities, Itasca County, and local organizations. The city of Grand Rapids hosts the Grand Rapids Riverfest, Downtown Art Fair, and other events. Itasca County hosts an annual county fair in the city of Grand Rapids. In addition, a wild rice festival is held annually in the city of Deer River.

4.3.3.1 Impacts and Mitigative Measures

Minnesota Power does not anticipate the need for road closures during active construction. There are no specific tourism opportunities within the Project. Nearby annual community festivals and events are held within city limits and not within the Project. Construction and operation of the Project will not impact tourism opportunities at the White Oak Casino or other nearby attractions. Therefore, Minnesota Power does not propose mitigative measures.

4.3.4 Mining

Itasca County is home to multiple mining operations that extract and process materials such as aggregates, clay, iron, and limestone (reference (95)). Based on DOT's Aggregate Source Information System (ASIS) data, there are no mining operations within the Project (reference (96)). According to the ASIS data, the closest aggregate pit is 1.5 miles east of the Project.

4.3.4.1 Impact and Mitigative Measures

No mining resources are within or directly adjacent to the Project. Construction and operation of the Project will not impact commercial mining operations; therefore, Minnesota Power does not propose mitigative measures.

4.4 Archaeological and Historical Resources

Barr completed a Phase Ia literature review (Phase Ia) in June 2024 for the Project and a 1-mile study area surrounding it that consisted of:

- A review of MnSHIP, Minnesota's Statewide Historic Inventory Portal
- A review of the Office of the State Archaeologist (OSA) Portal
- A review of the National Register of Historic Places (NRHP) Database
- A review of historic maps and aerial imagery.

Within the 1-mile study area, the Phase Ia identified 15 previously recorded archaeological sites and three previously recorded historic architectural resources have been documented (Table 4-13). These include one archaeological site (21IC0472) and one historic architectural resource (XX-ROD-00052) within the Site. Most of these resources have an undetermined National Register of Historic Places (NRHP) eligibility status. However, archaeological site 21IC0472, which consists of the remnants of a historic farmstead, was recommended not eligible for the NRHP and historic architectural resource XX-ROD-00052 (Trunk Highway 6) was determined not eligible for the NRHP.

Table 4-13 Cultural Resources Within 1 Mile of the Project

Resource Number	Resource Type	Description	NRHP Eligibility	Within Project Area
21IC0472	Archaeological	Historic Farmstead Remnant	Recommended Not Eligible	Yes
XX-ROD-00052	Historic Architectural	Trunk Highway 6	Determined Not Eligible	Yes
21IC0048	Archaeological	Precontact Artifact Scatter	Undetermined	No
21IC0064	Archaeological	Precontact Habitation/Burial/Artifact Scatter	Undetermined	No
21IC0065	Archaeological	Precontact Habitation/Artifact Scatter	Undetermined	No
21IC0066	Archaeological	Precontact Habitation/Artifact Scatter	Undetermined	No
21IC0077	Archaeological	Precontact Habitation/Artifact Scatter	Undetermined	No
21IC0082	Archaeological	Precontact Lithic Scatter	Undetermined	No
21IC0083	Archaeological	Precontact Lithic Scatter	Undetermined	No
21IC0084	Archaeological	Precontact Artifact Scatter	Undetermined	No
21IC0473	Archaeological	Historic Farmstead	Recommended Not Eligible	No
21IC0481	Archaeological	Historic Homestead	Undetermined	No
21ICan	Archaeological	Alpha Site - Precontact Isolate	Undetermined	No
21ICao	Archaeological	Alpha Site - Precontact Isolate	Undetermined	No
21ICaom	Archaeological	Alpha Site - Historic Depression and Pickup Truck Cab	Recommended Not Eligible	No
21ICdi	Archaeological	Alpha Site - Historic Ghost Town - Weller's Spur	Undetermined	No
IC-CHC-00009	Historic Architectural	Eastern Railway/GN/BN/BNSF (Duluth & Winnipeg)	Undetermined	No
XX-ROD-00176	Historic Architectural	Trunk Highway 2	Determined Not Eligible	No

The Project setting is conducive for the presence of as-yet undocumented cultural resources. As a result, Minnesota Power requested that Barr complete a Phase I archaeological reconnaissance (Phase I) for the developable land within Project boundaries. Barr surveyed 695 acres, constituting the area of potential ground disturbance for the Project. The survey included approximately 321 acres of pedestrian survey and 374 acres of shovel test unit excavation. The Phase I fieldwork, completed in July and August 2024, identified six new archaeological sites. These include a precontact lithic scatter (21IC0485), a precontact ceramic isolated find (21IC0486), and four historic artifact scatters (21IC0487, 21IC0488, 21IC0489 and 21IC0490). Each of these sites is recommended *Not Eligible* for listing on the National Register of Historic Places (NRHP). One previously identified site located within the Project area, 21IC0472, could not be relocated. Site 21IC0472 was previously recommended *Not Eligible* for listing on the NRHP. Based on the results of the Phase I, which represents a reasonable and good faith effort to identify cultural resources within the Project area, no significant cultural resources will be impacted by the Project. No additional cultural resources work is recommended for the Project to proceed as planned.

4.4.1.1 Impacts and Mitigative Measures

Solar Facility and Gen-Tie Line

Phase I archaeological survey is currently ongoing within the Site and Gen-Tie Line. SHPO/THPO coordination regarding the results will occur upon completion of the survey. In addition, prior to construction, Minnesota Power will prepare an Unanticipated Discoveries Plan that will describe procedures to implement if previously unrecorded cultural resources or human remains are encountered during construction of the Project.

4.5 Natural Environment

4.5.1 Air Quality

4.5.1.1 Existing Air Quality

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, referred to as "criteria pollutants." The CAA identifies two classes of NAAQS: primary standards, which are limits set to protect the public health of the most sensitive populations, such as asthmatics, children, and the elderly; and secondary standards which are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife, and structures. The six criteria pollutants are (reference (97)):

- ground-level ozone (O_3)
- particulate matter (PM_{10}/$PM_{2.5}$)
- sulfur dioxide (SO_2)
- nitrogen dioxide (NO_2)
- carbon monoxide (CO)
- lead (Pb)

Air quality in the Project presently meets federal air quality standards because Minnesota is currently in attainment for all the NAAQS, except for a portion of Dakota County (approximately 200 miles south of Itasca County), which is not in attainment with the 2008 lead standard (reference (98)).

In Minnesota, the MPCA tracks air quality using monitoring stations and uses data from these monitors to calculate the Air Quality Index (AQI), on an hourly basis, for criteria pollutants except Pb. The pollutant with the highest value for a particular hour sets the overall AQI for that hour. The MPCA uses the AQI to categorize the air quality of a region as one of five levels of quality (reference (99)):

- good
- moderate
- unhealthy for sensitive groups
- unhealthy,

- very unhealthy

The nearest air quality monitor is Leech Lake, approximately 20 miles southwest of the Project. This station monitors for O_3 and $PM_{2.5}$. Table 4-14 provides the AQI for Leech Lake, Minnesota for the most recent five years of available data.

Table 4-14 Days in Each Air Quality Index Category for the Leech Lake, Minnesota Monitor

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2022	340	8	0	0	0
2021	241	99	6	4	1
2020	335	11	0	0	0
2019	332	17	1	0	0
2018	292	28	0	0	0

Source: reference (100)

The AQI results in Leech Lake, Minnesota show primarily good air quality days where concentrations of O_3 and $PM_{2.5}$ are low. Moderate days are the second most common results. The AQI was considered unhealthy for sensitive groups for six days in 2021 and one day in 2019 due to wildfire smoke. The AQI was considered unhealthy for four days and very unhealthy one day in 2021 due to wildfire smoke. There were zero days in the last five years where the air quality was very unhealthy. These categories are more common in highly populated areas due to an increase of sources that contribute to the AQI, such as cars, trucks, and industry.

4.5.1.2 Impacts and Mitigative Measures

Solar Facility

Minor temporary effects on air quality may occur during construction and primarily consist of emissions from construction equipment and other vehicles, and from fugitive dust generated from surface activities. Fugitive dust from vehicles or equipment traveling on unpaved roads or in areas where fine-textured soils can become windborne. The following influence the amount of fugitive dust released:

- level of construction activity
- road surface characteristics
- soil type
- soil moisture content
- wind speed
- precipitation
- vehicle characteristics like weight and speed

Dust emissions are greater during dry periods and in areas where fine-textured soils are subject to surface activity. Minnesota Power may employ construction-related practices such as the following to minimize dust generation:

- application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic
- reducing the speed of vehicular traffic on unpaved roads
- covering open-bodied haul trucks
- containment of excavated material
- protection of exposed soil
- soil stabilization
- treating stockpiles

Adverse effects on the surrounding environment will be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

Weather conditions and the type of construction activity generally influence the magnitude of exhaust emissions during construction. Air emissions from Site construction activities will likely include primarily carbon dioxide (CO_2), nitrogen oxides (NO_x), and PM. Exhaust emissions, primarily from diesel and other carbon-based fueled equipment, will vary with the phase of construction. Minnesota Power will minimize emissions from construction vehicles by using modern equipment with lower emissions ratings and properly functioning exhaust systems. Adverse effects on the surrounding environment will be negligible because of the short and intermittent nature of the emission producing construction phases.

After the construction phase, wind-blown fugitive dust emissions will be lower than current or historic emissions because of the establishment of perennial native vegetation. While maintenance vehicles traveling on gravel access roads may generate some fugitive dust, it will be minimal as compared to active agricultural practices, temporary, and infrequent throughout the year.

The Project will have an overall effect of improving air quality by replacing electrical generation produced from the burning of fossil fuels. This is expected to reduce harmful greenhouse gas (GHG) and other pollutant emissions detrimental to air quality. Additionally, since agricultural operations at the Site will no longer occur during construction and operation of the facility, there will be a reduction in particulate emissions, dust, and farm equipment exhaust which will further improve air quality at and in the vicinity of the site.

Gen-Tie Line

Minor temporary effects on air quality may occur during construction and primarily consist of emissions from construction equipment and other vehicles, and from fugitive dust generated from surface activities. The amount of fugitive dust and magnitude of exhaust emissions during Gen-Tie Line construction will be influenced by the same factors as noted for the Solar Facility. Minnesota Power may employ construction-related practices to minimize dust generation, as noted for the Solar Facility. Minnesota Power will minimize emissions from construction vehicles by using modern equipment with lower emissions ratings and properly functioning exhaust systems. Adverse effects on the surrounding environment will be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

During operation of the Gen-Tie Line, small amounts of NO_X and O_3 are created due to corona from the operation of transmission lines. The emission of O_3 from the operation of a transmission line of the voltages proposed for the Project will be minimal. During operation, Minnesota Power will minimize corona effects by implementing good engineering practices.

4.5.2 Geology

Bedrock geology of the Project consists of Archean intrusive rock of foliated to gneissic tonalite, granodiorite, and diorite of the Giants Range batholith (reference (101)). Depth to bedrock ranges from approximately 50 to 150 feet below ground surface (bgs) (reference (102)).

Regional surface geology is dominated by quaternary aged glacial deposits from the most recent Wisconsinian glaciation. Gravelly, sandy, and clayey glaciolacustrine sediments deposited by glacial lakes are most prevalent within the Project. Stagnation moraine sediment deposited by ice of the St. Louis sublobe, as well as post glacial floodplain alluvium are also present within the Project (reference (103)).

There are no karst features within the Project (reference (104)).

4.5.2.1 Impacts and Mitigative Measures

Solar Facility

Thick glacial deposits cover the Site. Bedrock appears deeper than 50 feet and was not encountered during a geotechnical investigation (reference (105)). Due to the thickness of the unconsolidated materials, excavation or blasting of bedrock is unlikely to occur during construction. There are no known karst features. Potential impacts to geologic resources are limited or none; therefore, Minnesota Power does not propose mitigative measures.

Gen-Tie Line

Bedrock appears deeper than 50 feet and was not encountered during a geotechnical investigation. Potential impacts to geologic resources are expected to be limited or none; therefore, Minnesota Power does not propose mitigative measures.

4.5.3 Groundwater Resources

The DNR divides Minnesota into six groundwater provinces based on bedrock and glacial geology. The aquifers within these provinces occur in two general geologic settings: bedrock, and unconsolidated sediments deposited by glaciers, streams, and lakes. The Project is in the Central Province (Province 4). The Central Province has thick glacial sediment, sand and gravel aquifers are common, and the deeper fractured crystalline bedrock has poor aquifer properties and limited use as an aquifer (reference (106)).

The groundwater flow direction in these shallow, unconsolidated sediments is expected to follow surface topography and surface water flow. However, the groundwater flow direction may vary throughout the Project depending on factors such as the presence of underground utilities and/or other surficial features. The depth to the water table is approximately <10 to 50 feet bgs in the Project (reference (107)).

There are no springs identified within the Project based on a search of the Minnesota Spring Inventory database (reference (108)).

4.5.3.1 Sole Source Aquifer

The EPA defines a sole source aquifer (SSA) or principal source aquifer area as:

- one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer
- where contamination of the aquifer could create a significant hazard to public health
- where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer.

There are currently no EPA-designated SSAs in the vicinity of the Project (reference (109)).

4.5.3.2 Minnesota Well Index

Based on review of publicly available well records from the Minnesota Department of Health (MDH) Minnesota Well Index (MWI) (reference (110)), there is one active domestic water well and two active monitoring wells documented within the Project (Map 12, Table 4-15).

Table 4-15 MWI Wells within the Project

Unique Well ID[1]	Well Name	Well Elevation (ft Amsl)	Drilled Depth (ft)	Casing Depth (ft)	Static Water Level (ft)	Well Installation Date	Well Use	Status
809847	Warren	NL	79	75	5	9/30/2015	Domestic	Active
455353	NL	NL	19	8.5	11	7/11/1989	Monitoring well	Active
NL	NA69	NL	NL	NL	NL	NL	Monitoring well (NPDES)	NL

[1] MDH. 2024. Minnesota Well Index; Minnesota Department of Health https://www.health.state.mn.us/communities/environment/water/mwi/index.html

NL – not listed

4.5.3.3 Wellhead Protection Areas

The Wellhead Protection Area (WHPA) program administers the public and non-public community water supply source-water protection (SWP) in Minnesota. WHPAs are areas surrounding public water supply wells that contribute groundwater to the well. In these areas, contamination on the land surface or in water can affect the drinking water supply. WHPAs for public and community water-supply wells are delineated based on a zone of capture for 10-year groundwater time-of-travel to the well and are available through a database and mapping layer maintained by MDH (reference (111)) The viewer also includes the Drinking Water Supply Management Areas (DWSMA) and DWSMA Vulnerability. DWSMAs are delineated areas within the WHPA and are managed in a wellhead protection plan, usually by a city. According to the viewer, there are no WHPAs or DWSMAs within the Project. One WHPA and associated DWSMA (Cohasset Municipal Water System) is adjacent to the Project on the east side of the Gen-Tie Line (Map 12). The DWSMA vulnerability is designated as moderate.

4.5.3.4 Special Well and Boring Construction Areas

A Special Well and Boring Construction Area, or well advisory, is a mechanism which provides for controls on the drilling or alteration of public and private water-supply wells, and environmental wells in an

area where groundwater contamination has, or may, result in risks to the public health. There are no MDH-designated Special Well and Boring Construction Areas in Itasca County (reference (112)).

4.5.3.5 Impacts and Mitigative Measures

Solar Facility

Due to the relatively shallow nature of construction activities, Minnesota Power does not anticipate impacts to groundwater resources.

There are no designated SSAs, WHPAs, or DWSMAs within the Site. Minnesota Power will restore the Project Area disturbed during construction with perennial vegetation as described in the VMP, which allows for water to filter into the soil for treatment (Appendix F). Minnesota solar projects are semi-impervious in nature. An increase in impervious surfaces has the potential to increase stormwater runoff and, in turn, reduce groundwater recharge. Minnesota Power will manage surface water that flows or falls onto impervious surfaces in accordance with conditions of the National Pollutant Discharge Elimination System (NPDES) stormwater permits.

There are three documented water wells within the Site. Minnesota Power will assess any wells identified prior to and during construction to determine if they are open, and seal them, if necessary, in accordance with MDH requirements.

According to MDH MWI records, shallow groundwater was encountered at 11 feet bgs in monitoring well 455353. Groundwater was encountered in several geotechnical soil borings completed within the Project at depths ranging from 4 to 19 feet bgs (reference (105)). Minnesota Power will obtain a Water Appropriation/Dewatering Permit from MNDNR for dewatering if necessary during construction. Minnesota Power will discharge any construction trench water to surrounding areas using appropriate BMPs to minimize erosion and allow it to infiltrate back into the ground in accordance with applicable permits.

Minnesota Power will prepare and implement a Spill Prevention, Countermeasures and Control (SPCC) plan for the main transformer at the Project substation to prevent spills or leaks in accordance with USEPA regulations.

Gen-Tie Line

Structure foundations will generally range from 20 feet to 60 feet in depth. All foundation materials will be non-hazardous materials. In areas where shallow depths to bedrock or groundwater resources are encountered, specialty structures requiring wider, but shallower, excavation for foundations may be used.

Like the Solar Facility, there are no designated SSAs, WHPAs, or DWSMAs within the Gen-Tie Line. One WHPA and associated DWSMA (Cohasset Municipal Water System) is directly adjacent to the Gen-Tie Line at the point of interconnection. Minnesota Power will restore disturbed areas with perennial vegetation, which allows for water to filter into the soil for treatment. Minnesota Power will manage surface water that flows or falls onto impervious surfaces in accordance with conditions of a NPDES stormwater permit.

There are no documented water wells within the Gen-Tie Line. Minnesota Power will assess any wells identified during construction to determine if they are open, and seal them, if necessary, in accordance with MDH requirements.

4.5.4 Soils and Prime Farmland

The soils within the Project include sandy loam, loamy sand, loam, muck, and mucky peat. The U.S. Department of Agriculture Soil Survey Geographic database (SSURGO) database is a digital version of the original county soil surveys developed by the Natural Resources Conservation Service (NRCS). SSURGO is intended for use with the Geographic Information System (GIS) and can be displayed as tables and maps (reference (113)). Soil maps are linked in the SSURGO database to provide information about the component soils and their properties. Map 13 identifies the soil types within the Project. Table 4-16 and Table 4-17 summarize the soil properties within the Site and Gen-Tie Line.

Table 4-16 Soil Types within the Site

Soil Map Unit Name	Acres	Percent of Site	Drainage Class 1	Hydrologic Soil Group 2	Susceptibility to Compaction 3	Rutting Hazard 4	Erosion Hazard 5
Wawina-Cedar Valley complex, 1 to 18 percent slopes	418.6	31%	Well drained	B	Low	Severe	Moderate
Cutaway loamy sand, 0 to 8 percent slopes	289.4	22%	Well drained	B	Low	Moderate	Slight
Effie-Ashlake-Effie, frequently ponded, complex, 0 to 2 percent slopes	122.1	9%	Poorly drained	C/D	Medium	Severe	Slight
Ashlake-Effie complex, 0 to 4 percent slopes	99.7	7%	Somewhat poorly drained	C/D	Medium	Severe	Slight
Sago and Roscommon soils	58.3	4%	Very poorly drained	B/D	Low	Severe	Slight
Mooselake and Lupton soils, 0 to 1 percent slopes	50.4	4%	Very poorly drained	A/D	Low	Severe	Slight
Seelyeville-Bowstring association	48.9	4%	Very poorly drained	A/D	Low	Severe	Slight
Redby loamy fine sand, 0 to 3 percent slopes	48.1	4%	Somewhat poorly drained	A/D	Low	Moderate	Slight
Cowhorn-Onega-Sago, frequently ponded complex, 0 to 3 percent slopes	35.6	3%	Somewhat poorly drained	A/D	Low	Severe	Slight
Ashlake-Suomi complex, 1 to 8 percent slopes	22.4	2%	Somewhat poorly drained	C/D	Medium	Severe	Slight
Histosols, ponded	16.7	1%	Very poorly drained	A/D	Low	Severe	Slight
Nebish loam, 1 to 8 percent slopes	12.1	1%	Well drained	C	Medium	Severe	Slight
Tawas muck	12.0	1%	Very poorly drained	A/D	Low	Severe	Slight
Bearville loamy sand	11.1	1%	Poorly drained	C/D	Low	Moderate	Slight
Sandwick loamy fine sand	6.9	1%	Poorly drained	C/D	Low	Moderate	Slight
Hamre-Tacoosh-Effie complex, 0 to 1 percent slopes, frequently ponded	5.1	0%	Very poorly drained	C/D	Low	Severe	Slight
Warba-Menahga complex, 10 to 25 percent slopes	3.9	0%	Well drained	C	Medium	Severe	Moderate

Note(s): The Site and Gen-Tie Line corridor overlap. Therefore, some soil areas are included in both Table 4-16 and Table 4-17.
Resource: Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO)
[1] This soil category classifies soils in seven classes based on the rate that water moves through the soil.
[2] Soils are classified by the NRCS into four Hydrologic Soil Groups based on the soil's runoff potential: Groups A, B, C, and D. Group A generally has the lowest runoff potential and Group D has the highest runoff potential.
[3] Soils included in the total acres reported as susceptible to compaction include those with a rating of "Medium" or higher.
[4] Soils included in the total acres reported as having a rutting hazard include those with a “moderate” or “severe” rating
[5] Soils included in the total acres reported as having an erosion hazard include those with a “moderate”, “severe”, or “very severe” rating.

Table 4-17 Soil Types within the Gen-Tie Line

Soil Map Unit Name	Acres	Percent of Site	Drainage Class 1	Hydrologic Soil Group 2	Susceptibility to Compaction 3	Rutting Hazard 4	Erosion Hazard 5
Water	52.1	41%	Not Applicable				
Wawina-Cedar Valley complex, 1 to 18 percent slopes	39.9	31%	Well drained	B	Low	Severe	Moderate
Cutaway loamy sand, 0 to 8 percent slopes	12.4	10%	Well drained	B	Low	Moderate	Slight
Udorthents, nearly level to rolling	9.1	7%	Well drained	A	High	Severe	Moderate
Mooselake and Lupton soils, 0 to 1 percent slopes	5.2	4%	Very poorly drained	A/D	Low	Severe	Slight
Bearville loamy sand	3.7	3%	Poorly drained	C/D	Low	Moderate	Slight
Redby loamy fine sand, 0 to 3 percent slopes	2.8	2%	Somewhat poorly drained	A/D	Low	Moderate	Slight
Cathro muck, occasionally ponded, 0 to 1 percent slopes	1.5	1%	Very poorly drained	B/D	Low	Severe	Slight
Dora mucky peat	0.5	0%	Very poorly drained	B/D	Low	Severe	Slight

Note(s): The Site and Gen-Tie Line corridor overlap. Therefore, some soil areas are included in both Table 4-16 and Table 4-17.
Resource: Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO)
[1] This soil category classifies soils in seven classes based on the rate that water moves through the soil.
[2] Soils are classified by the NRCS into four Hydrologic Soil Groups based on the soil's runoff potential: Groups A, B, C, and D. Group A generally has the lowest runoff potential and Group D has the highest runoff potential.
[3] Soils included in the total acres reported as susceptible to compaction include those with a rating of "Medium" or higher.
[4] Soils included in the total acres reported as having a rutting hazard include those with a “moderate” or “severe” rating
[5] Soils included in the total acres reported as having an erosion hazard include those with a “moderate”, “severe”, or “very severe” rating.

7 CFR 657.5(a) defines Prime Farmland as:

> *"land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding."*

Soils not meeting the above criteria may still be prime farmland if draining or irrigating addresses the limiting factor.

The NRCS also recognizes farmland of statewide importance, defined as lands other than prime farmland that are used for production of specific high-value food and fiber crops (e.g., vegetables). Farmlands of statewide importance have the special combination of soil quality, location, growing season, and moisture supply necessary to economically produce sustained high quality or high yields of specific crops. Farmland of statewide importance is like prime farmland but with minor shortcomings such as greater slopes or less ability to store soil moisture. The methods for defining and listing farmland of statewide importance are determined by the appropriate state agencies, typically in association with local soil conservation districts or other local agencies.

Portions of the Project are designated as prime farmland, farmland of statewide importance, and prime farmland if drained (Table 4-18) (Map 14).

Table 4-18 Designated Prime Farmland within the Project

Project Area	Total Acres (Ac)	Prime Farmland (Ac)	Statewide Importance (Ac)	If Drained (Ac)	If Protected (Ac)	Not Prime Farmland (Ac)
Gen-tie Line corridor	127.2	0	12.4	0	0	109.8
Site	1344.5	34.5	289.4	221.9	0	289.4

Note(s): The Site and Gen-Tie Line corridor overlap. Therefore, some soils are counted twice and included in both rows of Table 4-18.

4.5.4.1 Impacts and Mitigative Measures

Solar Facility

Solar projects have the potential to impact soils during construction and decommissioning. During construction, grading activities required to provide a level surface for safe operation of construction equipment will impact soils. Soil erosion, compaction, and topsoil and subsoil mixing are possible within temporary work areas.

Most soils within the Site are susceptible to moderate or severe rutting. Over one third of the Site (41 percent) contains soils with poor drainage (i.e., soils are very poorly drained, poorly drained, or somewhat poorly drained) and less than a quarter of the Site (19 percent) contains soils that are susceptible to compaction.

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. Construction equipment traveling over wet soils could disrupt the soil structure, reduce pore space, increase runoff potential, and cause rutting. The degree of compaction depends on moisture content and soil texture. Appendix E provides additional information regarding prime farmlands.

Minnesota Power will implement the following measures to minimize impacts to soils and designated prime farmland:

- The AIMP (Appendix D) describes methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation cover. These measures will help Minnesota Power construct and operate the Project so they can return the land to its original use (agriculture) after decommissioning.
- The VMP (Appendix F) describes methods to plant and stabilize soil during and after construction. The VMP outlines methodologies for proper vegetation installation, including guidance for soil preparation, seeding, and seed mixes. The establishment of perennial vegetation will preserve or improve the soil quality over time, and studies indicate planting pollinator habitat may increase yields of adjacent cropland that relies on insect pollinators (e.g., soybeans, reference (114)).
- Minnesota Power will develop and implement a SWPPP to minimize soil erosion and impacts during construction. The SWPPP will include BMPs such as silt fencing, temporary seeding/stabilization, stormwater basins, and project phasing.

Gen-Tie Line

Most soils within the Gen-Tie Line corridor are susceptible to moderate or severe rutting. Only 8 percent of the Gen-Tie Line corridor contains soils with poor drainage (i.e., soils are very poorly drained, poorly drained, or somewhat poorly drained) and only 5 percent of the Gen-Tie Line corridor contains soils that are susceptible to compaction. Minnesota Power will implement the AIMP (Appendix D), VMP (Appendix F), and SWPPP to minimize impacts to soils and designated prime farmland.

4.5.5 Surface Waters and Floodplains

The Project is within the Mississippi River-Headwaters HUC 8 (HUC 07010101). Surface waters within the Project consist of lakes, ponds, streams, and wetlands, eventually flowing to the Mississippi River, which borders the southern portion of the Site (Map 17). The northwest corner of the Site split between two subwatersheds, the White Oak Lake-Mississippi River (070101010903) and Rice Lake-Mississippi River (070101010909).

There are two public waterbodies within the Site - Warburg Lake (31056300) and Blackwater Lake (31056100). Lakes in Minnesota are given a public waters designation under Minnesota Statue 103G.005, Subdivision 15. For public waterbodies within the Site, a shoreline management classification is assigned. Warburg Lake is classified as a natural lake environment and Blackwater Lake is classified as recreational development.

The Site is within an A Zone where 100-year base flood elevations are not determined. Most of the Site and Gen-Tie Line are within C Zone or an area with minimal flooding (reference (115)).

Wetland delineations occurred in 2023 (reference (116)) and in 2024 (reference (117)). Within the Project area, there are 109 number of wetlands consisting of 293.4 acres (Map 16). Table 4-19 provides a summary of delineated wetlands within the Project.

Table 4-19 Delineated Surface Waters Within the Project Area

Feature Type	Area (acres)
Wetland	293.4
Lake	45.5
Stream	4.7

Source: (reference (116))

There are two impaired waters within one mile of the Project (Map 17). Blackwater Lake (31-0561-00) is situated at the southern edge of the Site and is impaired for mercury in fish. This impairment was included in a statewide total maximum daily load (TMDL) study in 2010. Guile Lake (31-0569-00) is also impaired for mercury in fish and was included in the statewide mercury TMDL in 2007. There are no impaired streams or wetlands within the Site boundary or within one mile of the Project.

Lakes of biological significance are determined based on presence of unique plant or animal communities. Blackwater Lake is classified as a lake of biological significance and receives a rating of "outstanding". Within one mile of the Project boundary, Little White Oak Lake is also considered a lake of biological significance and receives a "high" rating.

There are no designated trout streams, trout lakes, wildlife lakes within the Project. The reach of the Mississippi River bordering the Site is designated as an outstanding resource value (ORV) restricted water. ORV designated waters have additional protections to protect their unique natures, which may include high water quality, exceptional recreation, cultural, aesthetic, or scientific value (reference (117)). This reach of the Mississippi River is classified as restricted (Minn. R. 7050.0335).

4.5.5.1 Impacts and Mitigative Measures

Solar Facility

Wetlands may experience permanent and temporary impacts as a result of the Project. The delineated wetlands may be permanently impacted by the installation of solar arrays over wetlands within the existing agricultural fields. The Project will be designed to reduce impacts to wetlands by maintaining existing wetland contours. Minnesota Power will coordinate with the USACE and LGU to determine which wetlands would be regulated under the Clean Water Act and Wetland Conservation Act and to identify minimization measures for the permanent wetland impacts.

Temporary wetland impacts would occur during Project construction. Minnesota Power will install the electrical collection system by trenching, plowing, and/or bore methods depending on the site conditions. Regardless of the installation methods, construction will not result in a permanent loss in wetlands. The estimated temporary wetland impact for construction of the Site is 0.89 acres.

Minnesota Power will control runoff from the Site by implementing stormwater management practices as described in Section 3.5.9. Stormwater basins will capture and treat runoff from impervious surfaces and solar arrays. Permanent stormwater facilities may include infiltration basins, bioswales, or detention ponds. Minnesota Power will protect wetlands outside of grading areas using BMPs to limit sedimentation from adjacent construction areas.

The two identified public waterbodies within the Site, Warburg and Blackwater, are outside of the Anticipated Development Area. Construction will not impact the lakes of biological significance, Blackwater and Little Drum Lake, or the impairment for Blackwater Lake. In addition, Guille Lake is on the opposite side of the Mississippi River and will not receive runoff from the Site.

The Site includes unmodernized floodplains in A flood zones. A flood zones are areas of flood hazard and do not have a detailed flood study to determine impacted elevations. Solar panels along Blackwater Lake and low-lying areas connecting to Warburg Lake could experience flooding. Minnesota Power will limit grading in these areas to not create fill in the floodplain.

Gen-Tie Line

The Gen-Tie Line will cross a portion of Blackwater Lake and connect into the existing Boswell Substation. The public water crossing will be less than 500 feet and does not require structures within the water. Minnesota Power will submit a utility crossing license to the DNR prior to construction activities.

Disturbances in wetlands adjacent to Blackwater Creek will be temporary. Construction disturbances occurring in wetlands will be temporary and Minnesota Power will restore to preconstruction conditions. The Gen-Tie Line will also cross a Zone A floodplain. Like wetland disturbances, floodplain disturbances will be temporary and will not require placing structures within the floodplain (Map 18).

4.5.6 Vegetation

The Chippewa Plains subsection of the Northern Minnesota Drift and Lake Plains section historically consisted of deciduous and coniferous forest (reference (2)). White pine and red pine were present on the moraines, while Jack pine was the dominant cover type on outwash plains and sandy lake plains. Hardwoods, such as northern red oak, sugar maple, and basswood, grew in sheltered areas of the moraines. Forested lowlands were occupied by black spruce, tamarack, white cedar, and black ash. Non-forested wetlands were dominated by sedge meadow communities. At present, much of this subsection remains forested and forestry is one of the most important land uses. Aspen is the most common tree species; it is found in both pure stands and mixed stands with birch, maple, oak, white spruce, jack pine, and red pine. Agriculture is important locally, particularly in the western part of the subsection.

According to the U.S. Geological Survey National Land Cover Database (NLCD), landcover within the Project consists predominantly of cultivated cropland/hay pastureland and forest, including forested wetlands and upland deciduous and mixed forest (Map 19). Additional landcover types within the Project include developed land, shrub/scrub, upland and wetland herbaceous, and open water. Based on field biological resources reviews conducted in September 2022 across most of the Site, wetlands, forest, and grassland/herbaceous vegetation are dominant (references (118); (119)).

According to the NLCD, landcover within the Gen-Tie Line consists of (Map 19):

- developed land
- cultivated cropland/hay pastureland
- forest
- forested wetlands

- deciduous and mixed upland forest
- upland and wetland herbaceous
- barren land
- open water

No field biological resources reviews have been conducted within the Gen-Tie Line.

4.5.6.1 Impacts and Mitigative Measures

Solar Facility

Land within the Site will convert from existing landcover types to solar energy infrastructure for the life of the Project (Map 3 and Map 19). Minnesota Power designed the Project to avoid tree clearing to the greatest extent practical; however, as shown on Map 3 tree clearing will occur within the Site.

Minnesota Power will seed the non-impervious portions of the Project with a low-growing native vegetation seed mix in accordance with the VMP (Appendix F). The seed mix will promote pollinator habitat, establish stable ground cover, reduce erosion and runoff, and improve infiltration. Control of invasive and noxious weeds will be ongoing during the construction and operation of the Project.

Gen-Tie Line

Minnesota Power will clear woody vegetation within the ROW to avoid the potential interference with safe operation of the transmission line. Permanent loss of vegetation will occur in areas where transmission line structures are installed. Minnesota Power will reseed temporarily disturbed areas to establish perennial vegetation.

4.5.7 Wildlife

The area within and around the Project contains a diversity of landscape types, including forest, wetlands, waterbodies, and agricultural land. These landscapes provide habitat for a variety of resident and migratory wildlife species, such as large and small mammals, songbirds, waterfowl, raptors, fish, amphibians, reptiles, and insects. These species use the area for forage, shelter, breeding, overwintering, and/or as a stopover during migration. Given the presence of roads, agricultural land, and Boswell Energy Center, wildlife inhabiting the area is likely adapted to human disturbance.

The Chippewa Plains Important Bird Area (IBA) covers most of the Project. The National Audubon Society works to identify, monitor, and protect habitat for migratory bird species throughout the U.S., in part by designating sites as IBAs. IBAs are designated when they meet certain criteria related to providing habitat for vulnerable species (reference (120)).

The Chippewa Plains IBA is a biologically diverse area due to the number and variety of lakes and wetlands, river systems, and forest communities. This area is rich with bird diversity as well, including species and habitats unique to only a few areas of Minnesota (reference (121)). This IBA is important for migrating waterfowl, with 160,000 Ring-necked Ducks and 30,000 Lesser Scaup recorded in 2011. Nesting waterbirds include Ring-billed and herring gulls, American white pelicans, common terns, and Minnesota's only site for Caspian terns (reference (121)).

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712), which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.

4.5.7.1 Impacts and Mitigative Measures

Solar Facility

Direct impacts on wildlife residing in the Site may occur during construction activities because of vehicle movement and ground disturbing activities. Vehicles and other equipment moving within the Site during construction and operations could injure or kill individuals, such as small mammals, amphibians, reptile species, and nesting birds.

Potential indirect impacts to wildlife may occur due to temporary and permanent habitat loss and displacement. During construction, indirect impacts to wildlife species could occur from habitat alteration and increased noise and human activity which could disrupt wildlife species in the vicinity of the Site, causing them to abandon habitat. Most common wildlife species are mobile and can leave the affected area or seek refuge within the area to avoid impacts. Extensive similar habitat is present in the vicinity of the Site. Minnesota Power will implement the DNR's recommendation of 50 feet from road rights-of-way to provide space for animals to travel (reference (122).

Minnesota Power will construct a 7-foot-tall fence, which will prohibit larger wildlife from accessing the Site. Smaller wildlife and avian species will be able to access the Site. The establishment of native herbaceous cover within the Site following construction will likely benefit wildlife species, such as small mammals, ground nesting birds, insects, and pollinators.

Construction of the Site will convert a portion of the Chippewa Plains IBA. However, given that this IBA includes almost 4 million acres of land and the abundance of comparable habitat outside of the Site; impacts are anticipated to be minimal. In addition, the establishment of native vegetation following construction will serve as suitable habitat for ground nesting birds.

Gen-Tie Line

During construction direct and indirect impacts to wildlife within the vicinity of the Gen-Tie Line will be similar to those described for the Site.

Once the Project is operational, there will be a potential risk of avian collision and electrocution with transmission conductors and equipment associated with the Gen-Tie Line, which could result in injury or death of individuals. Avian collision risk may be greater for certain at-risk species (e.g., waterfowl, waterbirds) during certain behaviors such as flushing, courtship displays, and aerial displays, potentially increasing risk if birds are distracted. To minimize potential impacts to avian species, Minnesota Power will incorporate recommendations in the Avian Powerline Interaction Committee's (APLIC) 2012 guidelines (reference (123)).

4.5.8 Rare and Unique Natural Resources

Per Section 7 of the Endangered Species Act (ESA) of 1973, as amended, activities conducted, sponsored, or funded by federal agencies must be reviewed for their effects on species federally listed or proposed for listing as threatened or endangered. Per the Minnesota ESA, the DNR is responsible for overseeing the regulations and permitting for development projects under Minn. Stat. § 84.0895 and

associated rules govern the taking (including killing, capturing, collecting, and/or possessing) of state endangered or threatened species in Minnesota.

4.5.8.1 Federal Rare Species

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC), was queried on June 7, 2024, identifies the following rare species potentially occurring in the Project (Appendix J):

- Canada lynx (*Lynx canadensis*; federally threatened and state special concern)
- Gray wolf (*Canis lupus*; federally threatened)
- Northern long-eared bat (*Myotis septentrionalis*; federally endangered and state special concern)
- Monarch butterfly (*Danaus plexippus*; federal candidate)
- Bald eagle (*Haliaeetus leucocephalus;* protected by the Bald and Golden Eagle Protection Act and MBTA)

No designated critical habitat is present within the vicinity of the Project. There have been no formal surveys to determine whether any federally protected species are present in the Project.

Canada Lynx

Canada lynxes inhabit boreal and mixed coniferous and deciduous forests, where snowshoe hare, their preferred prey, are present (reference (124)). Within these general forest types, Canada lynx are most likely to persist in areas that receive deep snow, for which the lynx is highly adapted. Although most Canada lynx reports in Minnesota are from St. Louis and Lake counties, they have also been documented in Itasca County (reference (124)). The forested areas within and adjacent to the Project could provide suitable habitat for Canada lynx.

Gray Wolf

Gray wolves are habitat generalists that depend on distribution of their prey, rather than the type, age, or structure of vegetation present (reference (125)). They occupy a diversity of habitats, including forests, prairies, and swamps, reflecting their adaptability as a species (reference (125)). The current density of the gray wolf is approximately one per 10 square miles and Alaska is the only U.S. state with a higher population of gray wolves than Minnesota (reference (126)). The Project and its vicinity could provide suitable habitat for gray wolves.

Northern Long-eared Bat

Northern long-eared bats roost in living and dead trees greater than 3 inches in diameter that have loose or peeling bark, cavities, or crevices (reference (127)). Suitable active-season habitat for northern long-eared bats is present in the forested areas within and adjacent to the Project. During winter, the northern long-eared bat hibernates in caves and mines. According to the DNR Natural Heritage Information System (NHIS) database, there are no known hibernacula in Itasca County and the nearest documented maternity roost trees are over 10 miles from the Project.

Monarch Butterfly

In December 2020, the USFWS assigned the monarch butterfly a candidate for listing under the ESA due to its decline from habitat loss and fragmentation. Candidate species are not protected by the ESA. The USFWS added the monarch to the updated national listing work plan and based on its listing priorities and workload, intends to propose listing the monarch in Fiscal Year 2024, if listing is still warranted at that time, with a possible effective date within 12 months of the proposed rule (reference (128)).

Monarch butterflies forage on flowering plants and rely exclusively on the presence of milkweed (*Asclepias* spp.) to complete the caterpillar life stage (reference (128)). Milkweed plants were not identified during field surveys; however, they could be present within the Project. In addition, the non-forested and non-agricultural parts of the Project that contain flowering plants could provide suitable foraging habitat for monarch butterflies.

Bald Eagle

The Bald and Golden Eagle Protection Act (BGEPA) and the MBTA provide protection for bald eagles. The BGEPA protects and conserves bald eagles and golden eagles (*Aquila chrysaetos*) from intentional take of an individual bird, chick, egg, or nest, including alternate and inactive nests. Unlike the MBTA, BGEPA prohibits disturbance that may lead to biologically significant impacts, such as interference with feeding, sheltering, roosting, and breeding or abandonment of a nest. Bald eagles typically nest in mature trees near large lakes or streams (reference (129)). Surveys conducted in April 2023 identified two bald eagle nests within the Site and one within the Gen-Tie Line; an additional nest was also observed in the Site, but it was determined to not be bald eagles (references (130); (131)).

Impacts and Mitigative Measures

Solar Facility

Canada lynx and gray wolves could be present within the vicinity of the Site; however, it is unlikely given that the habitat quality is relatively low and fragmented with development and agricultural land. Once the Site is operational, the 7-foot-tall fencing will exclude Canada lynx and gray wolves.

The DNR NHIS database does not indicate the presence of northern long-eared bat hibernacula in Itasca County and no maternity roost trees within 10 miles of the Site. However, it is possible that northern long-eared bats could use the forested areas within the Site as habitat.

Limited foraging habitat for monarch butterflies is present within the non-forested and non-agricultural part of the Site. During construction, some of these areas may be unavailable to monarchs; however, similar habitat is available outside of the Site. In addition, as discussed in Section 4.5.6, once construction is complete, Minnesota Power will seed the non-impervious areas with native vegetation, which could provide habitat for the monarch butterflies.

The USFWS has guidance concerning construction-related activities near bald eagle nests and recommends a minimum buffer of 660 feet around bald eagle nests during the nesting season of mid-January through July (reference (132)). Additionally, no tree clearing can occur within 330 feet of a bald eagle nest at any time of the year or within 660 feet during the nesting season (reference (132)). Minnesota Power will consult further with the USFWS if the Project cannot maintain these minimum buffers or if a bald eagle nest removal is necessary.

Gen-Tie Line

Potential impacts to federally protected species from the Gen-Tie Line construction will be comparable to those described for the Site. Once the Gen-Tie Line is operational, Minnesota Power does not anticipate impacts to Canada lynx, gray wolves, northern long-eared bats, or monarch butterflies. Once the Gen-Tie Line is operational, there is a potential for bald eagles nesting or passing through the area to collide with it. However, as noted in Section 4.5.7.1, Minnesota Power will minimize impacts to avian species, such as bald eagles, by incorporating recommendations in the APLIC 2012 guidelines (reference (123)).

4.5.8.2 State Rare Species

The DNR's NHIS database provides information on documented occurrences of Minnesota's rare species throughout the state. According to the NHIS database (Barr License Agreement 2022-008), there are no known occurrences of state threatened or endangered species within 1 mile of the Project. The NHIS database indicates that the following two state special concern species have been within 1 mile of the Project; however, neither species has been documented within the Project:

- small green wood orchid (*Platanthera clavellata*)
- peregrine falcon (*Falco peregrinus*)

Although the DNR tracks and monitors state special concern species, they are not legally protected under state law. However, like all migratory birds, the MBTA affords protection for the peregrine falcon (Section 4.5.7). No field surveys have been conducted to determine whether any state-protected species are present in the Project. However, based on field biological resources reviews conducted in September 2022, there is a moderate potential that state-protected species could be present (references (118); (133)).

Small Green Wood Orchid

The small green wood orchid primarily inhabits coniferous swamps that have a continuous or interrupted canopy of black spruce (*Picea mariana*) or tamarack (*Larix laricina*). Based on the wetland delineations conducted for the Project (references (119); (134)) and review of aerial photographs, habitat suitable for this species is not present.

Peregrine Falcon

Historically peregrine falcons nested on cliff ledges along rivers and lakes; however, at present, they primarily nest on buildings and bridges in urban settings (reference (135)). Peregrine falcons prefer non-forested areas for hunting due to their preference for direct aerial pursuit of their prey. The documented occurrences of peregrine falcons are located within the footprint of the Boswell Energy Center. There is a peregrine falcon nesting box on a stack at the Boswell Energy Center and a nesting pair has been observed there annually. Minnesota Power works with the Raptor Resource Project on this nesting site.

Impacts and Mitigative Measures

Solar Facility

Construction and operation of the Site are not likely to impact state-threatened, endangered, or special concern species. Minnesota Power submitted a Natural Heritage Review (NHR) request through the DNR MCE (Project ID 2024-00660) for the Project on August 6, 2024. A DNR NHR response has not yet been received.

Gen-Tie Line

Construction of the Gen-Tie Line is not likely to impact state threatened, endangered, or special concern species. Peregrine falcons nesting at the Boswell Energy Center are accustomed to human activity and disturbance. Once the Gen-Tie Line is operational, there is a potential for peregrine falcons nesting or passing through the area to collide with the transmission line. However, as noted in Section 4.5.7.1, Minnesota Power will minimize impacts to avian species, such as peregrine falcons, by incorporating recommendations in the APLIC 2012 guidelines (reference (123)).

4.5.8.3 DNR High Value Natural Resources

Native Plant Communities

The DNR Minnesota Biological Survey maps and classifies native plant communities (NPCs) throughout the state using plant species, soils, and other site-specific data from vegetation plots. There are no NPCs in the Site or Gen-Tie Line. However, as shown on Map 20, there are several NPCs adjacent to Site.

Native Prairie

Native prairie is “grassland that has never been plowed and contains plant species representative of prairie habitats” (reference (122)). Since the mid-nineteenth century, 99 percent of Minnesota’s 18 million acres of native prairie grassland has been destroyed. The DNR and MBS keep track of native prairie communities throughout the state as well as native prairie remnants along railroad rights-of-ways. Native prairie is generally not present in Itasca County and the closest native prairie is over 40 miles west of the Project.

Sites of Biodiversity Significance

The DNR maps Sites of Biodiversity Significance (SBS) and assigns a biodiversity significance rank to all sites surveyed across the state. These ranks are used to communicate statewide native biological diversity of each site and help to guide conservation and management activities (reference (136)). The DNR assigns biodiversity significance ranks, as follows:

- Outstanding (best occurrences of the rarest species and native plant communities)
- High (good quality occurrences of the rarest species and high-quality examples of native plant communities)
- Moderate (occurrences of rare species, moderately disturbed native plant communities)
- Below (sites with moderately disturbed native plant communities, but lacking occurrences of rare species)

As shown on Map 20, there are several SBS in the area, one of which, the Blackwater – Guile Lakes SBS ranked moderate, is partially within the Site.

Lakes, Wetlands, Streams, Rivers, and Floodplains

The DNR maps certain lakes as Lakes of Biological Significance based on the unique presence of aquatic plants or animals (reference (137)). The DNR assigns biological significance classes (outstanding, high, or moderate) to these lakes based on a variety of factors, such as the quality of the lake/habitat and presence of certain plants and animals. As shown on Map 20, several Lakes of Biodiversity Significance are scattered across the area, one of which, Blackwater Lake, which is ranked outstanding, is located within the southeastern edge of the Site and the Gen-Tie Line will cross it.

Wildlife Action Network and Minnesota Wildlife Action Plan

Minnesota is home to over 2,000 known native wildlife species and over 300 of these species have been identified as Species in Greatest Conservation Need (SGCN) because they are rare, their populations are declining, or they face serious threats that may cause them to decline. Minnesota's Wildlife Action Plan 2015-2025 includes a habitat approach, which focuses on sustaining and enhancing terrestrial and aquatic habitats for SGCN in the context of the larger landscapes (reference (138)). The Wildlife Action Plan lays out the basis for the long-term vision of a Wildlife Action Network composed of terrestrial and aquatic habitat cores and corridors to support biological diversity and ecosystem resilience with a focus on SGCN. As shown on Map 20, several Wildlife Action Network corridor polygons are scattered throughout the area, including a polygon in the northwestern part of the Site and a polygon associated with Blackwater Lake along the southeastern edge of the Site and eastern part of the Gen-Tie Line.

Large Block Habitats

Large blocks of grassland or forest habitat can provide "an increased diversity of species, higher species populations, and more resilient and complex ecological communities (reference (122)). Constructing solar projects within large block habitats causes habitat loss and fragmentation, which is detrimental to species who require large areas for nesting, food, population success, etc.

While there are large blocks of forest in the area, the Project is in a landscape that is fragmented by roads and agricultural land.

Impacts and Mitigative Measures

Solar Facility

Construction of the Site will directly impact sensitive ecological resources, including a part of the Blackwater – Guile Lakes SBS in the southern part of the Site and Wildlife Action Network Corridor polygons in the northwestern part of the Site (Map 3 and Map 20). Construction activities will temporarily remove vegetation and associated habitat from these sensitive ecological resources. However, both of these sensitive ecological resources extend far beyond the Site (Map 20) and will likely serve as refugia for species moving away from construction activities. Minnesota Power will minimize impacts to these sensitive ecological resources by reestablishing native vegetation in non-impervious areas.

Construction of the Site will not impact Blackwater Lake, a Lake of Biological Significance.

Gen-Tie Line

The Gen-Tie Line will cross a narrow section of a Wildlife Action Network Corridor polygon, which includes Blackwater Lake, in the eastern part of the corridor. The Gen-Tie Line will likely span these sensitive ecological resources given the maximum crossing distance is less than 300 feet. As such, Minnesota Power does not anticipate impacts to these resources and does not propose mitigative measures.

4.6 Climate Change

4.6.1 Existing Environment and Potential Future Conditions

The DNR Minnesota Climate Trends tool provides a summary of historical climate data for various regions across Minnesota (reference (139)). The historical climate data in this tool is from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (reference (140)) and the Parameter-elevation Regression on Independent Slopes Model Climate Group (reference (141)).

Table 4-20 shows temperature changes from the DNR Minnesota Climate Trends tool data for Itasca County from 1895 to 2023 and from 1994 to 2023 to represent the full record of data and the most recent 30-year climate normal period, respectively. In each temperature statistic, Itasca County exhibited an increase in daily temperature from 1895 to 2023. The annual minimum daily temperature has increased at the largest rate of the three temperature statistics.

Table 4-20 Historical Temperature Trends for Itasca County

Metric	Timeframe	Temperature Change (degrees Farenheit/decade)
Annual Average Temperature	1895-2023	+ 0.31
Annual Average Temperature	1994-2023	+ 0.09
Annual Maximum Temperature	1895-2023	+ 0.23
Annual Maximum Temperature	1994-2023	+ 0.01
Annual Minimum Temperature	1895-2023	+ 0.40
Annual Minimum Temperature	1994-2023	+ 0.16

Table 4-21 shows precipitation changes from the DNR Minnesota Climate Trends tool data for Itasca County. Total annual precipitation has increased from 1895 to 2023 by a rate of 0.18 in/decade and decreased from 1994 to 2023 by a rate of 1.01 in/decade.

Table 4-21 Historical Precipitation Trends for Itasca County

Metric	Timeframe	Precipitation Change (in./decade)
Total Annual Precipitation	1895-2023	+ 0.18
Total Annual Precipitation	1994-2023	- 1.01

Future projections are based on the Minnesota dynamically downscaled climate model data that was developed by the University of Minnesota and are summarized in three scenarios, Shared Socioeconomic Pathway (SSP) 245, SSP370, and SSP585. SSP is a measure adopted by the Intergovernmental Panel

on Climate Change (IPCC) to represent various greenhouse gas concentration pathways as well as social and economic decisions (reference (142)).

SSP245 represents a “Middle of the Road” scenario where economic, social, and technological trends follow historical patterns, population growth is moderate, and inequality persists. Additionally, SSP245 includes an intermediate emissions scenario, where a net radiative forcing of 4.5 watts per meter squared (W/m^2) is received by the earth due to the greenhouse gas (GHG) effect and emissions begin to decrease around 2040 (reference (142)).

SSP370 represents a “Regional Rivalry” scenario where nations focus on regional issues instead of cross-collaboration and development. SSP370 also includes a high emissions scenario, where a net radiative forcing of 7.0 W/m^2 is received by the earth (reference (142)).

SSP585 represents a “Fossil-fueled Development” scenario where there is increased development in competitive markets driven by an increased global consumption of fossil fuels. SSP585 also includes a very high emissions scenario, where a net radiative forcing of 8.5 W/m^2 is received by the earth and no emissions are reduced through 2100 (reference (142)).

Table 4-22 shows the model historical and projected temperature values for the Project. Under all scenarios for each statistic, temperature values are projected to increase through the end of the 21st century. The largest increases occurring in the minimum daily temperature under each scenario.

Table 4-22 Modeled Historical and Projected Temperature Trends for the Project

Scenario	Time Period	Average Daily Temperature (°F) – Ensemble Mean	Minimum Daily Temperature (°F) – Ensemble Mean	Maximum Daily Temperature (°F) – Ensemble Mean
Historical	1995-2014	40.1	31.9	50.9
SSP245	2040-2059	43.9 (3.8)	35.9 (4.0)	54.4 (3.5)
SSP245	2060-2079	45.4 (5.2)	37.4 (5.5)	55.7 (4.8)
SSP245	2080-2099	46.8 (6.7)	38.9 (7.0)	57.2 (6.3)
SSP370	2040-2059	44.7 (4.6)	36.5 (4.6)	55.6 (4.7)
SSP370	2060-2079	47.0 (6.9)	38.9 (7.0)	57.7 (6.8)
SSP370	2080-2099	49.1 (8.9)	41.2 (9.3)	59.5 (8.6)
SSP585	2040-2059	44.6 (4.5)	36.6 (4.7)	55.2 (4.2)
SSP585	2060-2079	47.4 (7.3)	39.6 (7.7)	57.7 (6.8)
SSP585	2080-2099	51.8 (11.7)	44.3 (12.4)	61.7 (10.8)

Note: Values in parentheses represent the difference from the modeled historical value.

Table 4-23 shows the model historical and projected precipitation values for the Project. Under the SSP245, a slight increase in precipitation followed by a decrease in precipitation is projected. Under SSP370, a decrease in precipitation from modeled historical values is projected to occur under all time periods (largest occurring before 2080). For SSP585, a slight decrease in precipitation from modeled historical values is projected followed by a sharp increase in precipitation by the end of the century.

Table 4-23 Modeled Historical and Projected Precipitation Trends for the Project

Scenario	Time Period	Total Annual Precipitation (in) - Ensemble Mean
Historical	1995-2014	28.0
SSP245	2040-2059	28.3 (0.3)
SSP245	2060-2079	27.7 (-0.3)
SSP245	2080-2099	27.8 (-0.2)
SSP370	2040-2059	24.6 (-3.4)
SSP370	2060-2079	24.9 (-3.1)
SSP370	2080-2099	27.3 (-0.7)
SSP585	2040-2059	27.3 (-0.7)
SSP585	2060-2079	29.2 (1.2)
SSP585	2080-2099	30.4 (2.4)

Note: Values in parentheses represent the difference from the modeled historical value.

The EPA Climate Resilience Evaluation and Awareness Tool (CREAT) anticipates an increase in 100-year storm intensity of 2.2 to 13.2 percent in 2035 and 4.2 to 25.8 percent in 2060 for the area (reference (143)). The EPA Streamflow Projections Map anticipates a change in average streamflow of the Mississippi River (NHD reach code: 07010101000006) by a ratio of 1.11 (90th percentile) under wetter projections and a ratio of 0.79 (10th percentile) under drier projections in 2071 to 2100 (RCP 8.5) compared to baseline historical flow (1976 to 2005) (reference (144)). This means that wetter and drier conditions are projected to increase at the end of the 21st century compared to the present. The Mississippi River borders the southern portion of the Site.

4.6.2 Potential Impacts of Climate Change on the Project

Because there is an anticipated increase in 100-year storm intensity for the area comprising the vicinity of the Project, there is potential for waterways to be subject to greater amounts of erosion. Minnesota Power will develop and implement a SWPPP during construction to minimize erosion. Storm events will also be considered during development of the SWPPP to design permanent stormwater features. During operation of the Project, vegetative cover will minimize potential for erosion impacts to waterways.

Periods of drought may also be possible; therefore, Minnesota Power selected seed mixes for permanent vegetation accordingly. Increased variability in temperature associated with climate change is not likely to affect construction or long-term operations.

Minnesota Power designed the Project to be resilient to future climate scenarios and the potential for more severe weather events (e.g., wind, hail, lightning). The design will consider wind speeds up to 120 miles per hour and snow loads. Minnesota Power will manage onsite vegetation to reduce fire potential in accordance with the VMP. Where required, Minnesota Power will comply with the requirements of NFPA 780 Standard for the Installation of Lightning Protection Systems. The impacts of climate change on the Project are likely to be minimal.

4.7 Greenhouse Gas Emissions

Anthropogenic carbon dioxide (CO_2) emissions are responsible for about two-thirds of the energy imbalance that is causing Earth's temperature to rise, which has direct and cascading effects on weather, vegetation, agriculture, disease, availability of water, and ecosystems (NOAA (reference (145))). There is general agreement that immediate and large-scale progress toward carbon neutrality is necessary. The

first binding global agreement, the Paris Agreement established in 2016, aims to keep the rise in mean global temperature to well below 3.6°F, and preferably limit the increase to 2.7°F (reference (146)).

More recently in 2021, the United States announced the Net Zero World Initiative to reach net zero by 2050 and the 2030 Greenhouse Gas Pollution Reduction target to achieve a 50-52 percent reduction GHG from 2005 levels (references (147); (148)).

The state of Minnesota has a goal for the reduction of greenhouse gas (GHG) emissions, set forth in Minn. Stat. § 216H.02, subd. 1:

> *It is the goal of the state to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050. The levels shall be reviewed based on the climate change action plan study.*

Amendments to Minn. Stat. § 216B.1691 which became effective in 2023, requires all electric utilities to generate or procure an amount equal to 100% of electricity sold to Minnesota customers from carbon-free sources by 2040, with an interim goal of 80% carbon-free electricity by 2030. Electric utilities must generate or procure 55% of electricity sold to Minnesota customers from an eligible energy technology by 2035.

4.7.1 Project Greenhouse Gas Emissions

The Project involves the construction and operation of a solar facility and a Gen-Tie Line. The nameplate capacity for the Project is up to 85 MWac, which is equivalent to approximately 166,909 MWh of energy generation. The average amount of GHG emissions associated with the generation of this amount of energy is approximately 78,725 short tons of carbon dioxide equivalent (CO_2e) annually. The Project will ultimately be a large contributor to GHG reduction and will assist in achieving the GHG emissions reduction and carbon-free electricity goals outlined by the state of Minnesota, as well as other national and international goals.

The total GHG emissions produced by the construction and operation of the Project will be minimal when compared to the reduction in long term emissions. GHG emissions associated with the construction and operation of the Project consists of direct emissions generated from combustion sources (e.g., mobile on- and off-road sources) and land use change. Indirect emissions associated with the operation of the Project include the GHG emissions associated with electrical consumption.

Emission factors used to calculate emissions from construction and operation are based on the EPA Emissions for Greenhouse Gas Inventories 2024 Emission Factors Hub (reference (149)). Emissions calculated for land use change were based on CO_2e flux estimates from the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022 (reference (150)). Table 4-24 summarizes the estimated Project construction GHG emissions. Appendix K provides the detailed calculations. Direct construction GHG emission sources include estimations of fuel combustion from mobile on- and off-road sources such as skid steers and excavators, and land use change. Operational emissions from temporary land use changes were calculated with the assumption that the Site and Gen-Tie Line convert to developed land (settlement EPA classification) for the duration of the Project. Construction emissions from temporary land use changes were calculated with an assumed construction duration of 60 days for each land use change area. The total estimated Project construction emissions are 3,465 short tons CO_2e.

Table 4-24 Summary of Construction GHG Emissions

Emission Source	Source Type	CO_2 (short tons)	CH_4 (short tons)	N_2O (short tons)	CO_2e (short tons)
Fuel Combustion	Direct	495.96	0.08	0.06	512.94
Land Use Change	Direct	--	--	--	2,951.87
TOTAL	**ALL SOURCES**	495.96	0.08	0.06	3,464.81

Table 4-25 summarizes the estimated Project operational GHG emissions. Appendix K provides the detailed calculations. Direct operational GHG emission sources include estimations of fuel combustion from operation and maintenance vehicles and equipment, and land use change. Operational emissions from land use changes were calculated with the assumption that the Site will convert to grassland and the Gen-Tie Line will convert to grassland following completion of the Project and for the duration of operations. At the conclusion of the Project operation, the Site will revert to agricultural use. Indirect operational emissions from electrical consumption in a small office area will be minimal. The total estimated Project operation emissions are 540 short tons CO_2e annually.

Table 4-25 Summary of Operations GHG Emissions

Emission Source	Source Type	CO_2 (short tons/year)	CH_4 (short tons/year)	N_2O (short tons/year)	CO_2e (short tons/year)
Fuel Combustion	Direct	34.79	6.28E-03	4.11E-03	36.05
Land Use Change	Direct	--	--	--	503.90
TOTAL	**ALL SOURCES**	34.79	6.28E-03	4.11E-03	539.95

4.8 Potential Cumulative Impacts

Cumulative effects are effects on the environment that result from the incremental effects of the Project when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time (40 CFR Part 1508.1 (i)(3)).

Environmental effects from past actions are inherently included in the descriptions of the existing conditions for each resource, as discussed in this Application. Short-term impacts from the Project could include increased traffic and emissions, increased noise, and potential pressure on local restaurant and lodging companies in the Project vicinity during construction. Long-term impacts from the Project include an increase in energy-related infrastructure that changes the aesthetics of the surrounding landscape.

Potential cumulate impacts could occur if the Project adds to impacts associated with other projects (past, present, or reasonably foreseeable future projects) within the area. To consider impacts from present and future planned projects, Minnesota Power inquired with city, township, and county representatives regarding their knowledge of planned projects within or near the Site and Gen-Tie Line. No foreseeable future projects were identified as a part of these communications. The following online resources were reviewed to identify potential Projects in the surrounding area:

- Itasca County Planning Commission 2019 meeting minutes (2020-2024 minutes not available)

- Itasca County Transportation Department website
- LLBO Division of Resource Management website
- Environmental Quality Board (EQB) Environmental Review Projects Interactive Map

Projects that are geographically and temporally similar to the Project, and therefore could potentially interact with the environmental effects of the Project include:

- **US Highway 2:** Based on the DOT's 2024-2033 10-Year Capital Highway Investment Plan, a 1.4-mile section of US Highway 2 will be resurfaced in fiscal year 2031 (State Project No. 3103-72). This highway section begins west of Pincherry Road and extends to E. Bass Lake Road in the city of Cohasset, 2.5 miles east of the Project.
- **County Road 62:** Based on Itasca County Transportation Department's 5-Year Plan for Highway Improvement Projects document, a 2.4-mile section of County Road 62 will receive a bituminous overlay and rehabilitation in 2024. This county road section begins north of County Road 63 and extends north to US Highway 2, 2.8 miles east of the Project.

These projects have the potential to cumulatively impact transportation within the region. As discussed in Section 4.2.14, the Project will lead to additional traffic and the potential for slow-moving construction vehicles within the region during Project construction. The identified projects in this region will also lead to an incremental increase in traffic during construction. However, resurfacing of US Highway 2 will not occur until 2031 and rehabilitation of County Road 63 will occur in 2024; therefore, construction of these two projects will not overlap with the construction of the Project. Therefore, no significant adverse cumulative effects on the region's overall transportation network are anticipated. Both projects are over 2.5 miles from the Project.

4.9 Unavoidable Impacts

Minnesota Power designed the Project to avoid impacts to environmental resources to the extent feasible and minimize by implementation of mitigative measures. Most of these unavoidable impacts will occur during construction of the Project and will resolve with the completion of construction.

Unavoidable impacts related to the Project that will last only as long as the construction period include:

- Noise associated with vehicles and equipment during construction.
- Increased traffic on roads that bisect the Site.
- Minor air quality impacts due to fugitive dust.
- Exposed soils from grading activities and potential for soil erosion and sedimentation.
- Disturbance to and displacement of some species of wildlife.
- Minor GHG emissions from construction equipment and workers commuting.

The primary unavoidable impacts during the life of the Project include:

- Changes to existing landscape, from agricultural land to a solar facility.

- Changes in land use and vegetation from forested land and agricultural land of predominately wheat and soybeans to a solar facility.
- Infrequent vehicle trips from maintenance activities.

5 Agency and Stakeholder Coordination

The Minnesota Power team engaged agencies and stakeholders via multiple means of communication such as:

- Sending a Project introductory letter to federal, state, and local agencies, and the 11 federally recognized tribes in Minnesota in July 2024 (Appendix H) to inform appropriate parties of the Project and seek feedback.
- Refer to the summary table below for additional communications with agencies and stakeholders:

Table 5-1 Agency and Stakeholder Coordination Summary

Agency/Stakeholder	Date	Summary or Concern Raised	Mitigative Measures
Leech Lake Band of Ojibwe	12/20/2023	Introduction of proposed Project including a discussion on potential impacts to wetlands and cultural resources.	Conduct field-level surveys for both wetland and cultural resources. Avoid resources as practicable.
	09/20/2024	Project status update including a discussion on the timeline of both the proposed Project permitting and archaeological field survey results.	Project to share environmental survey results, including Phase I Archaeological survey when complete.
US Fish & Wildlife Service	06/06/2024	Information for Planning and Consultation system's Northern Long-eared Rangewide Determination Key.	Determination provided that Project is not reasonably certain to cause incidental take of the northern long-eared bat.
Minnesota Department of Commerce Energy Environmental Review and Analysis	8/22/2024	Project introduction meeting	n/a
Minnesota Department of Transportation	08/27/2024	Project introduction meeting	n/a
United States Army Corps of Engineers	08/28/2024	Project introduction meeting	n/a
Minnesota Department of Natural Resources	08/30/2024	Project introduction meeting	n/a
Community Members	11/13/2024	Project team held an open house-style informational meeting at the Cohasset City Hall to inform and answer questions about the Project from members of the community.	n/a

Appendix H includes responses received to the Project introductory letter:

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Appendix A

Site and Route Permit Completeness Checklist

Site Permit Completeness Checklist

Authority	Required Information	Location in this Application
Minnesota Statutes 216E.04	Alternative Review of Applications	
Subdivision 1	An applicant who seeks a site permit or route permit for one of the projects identified in this section shall have the option of following the procedures in this section rather than the procedures in section 216E.03. The applicant shall notify the commission at the time the application is submitted which procedure the applicant chooses to follow.	Section 2.2
Subdivision 2, (4)	The requirements and procedures for alternative review apply to the following projects: high-voltage transmission lines in excess of 200 kilovolts and less than 30 miles in length in Minnesota.	Section 2.4
Subdivision 2, (8)	The requirements and procedures for alternative review apply to the following projects: Large electric power generating plants that are powered by solar energy.	Section 2.3
Minn. R. 7850.1900, Subp. 1	Site Permit for Large Electric Power Generating Plant	
A.	A statement of proposed ownership of the facility as of the day of filing and after commercial operation	Section 1.2.1 Section 1.2.2
B.	The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	Section 1.2 Section 1.2.2
C.	At least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the site.	Alternatives not required under alternative process (Minnesota Statutes 216E.04, Subdivisions 2 and 3)
D.	A description of the proposed large electric power generating plant and all associated facilities, including the size and type of the facility.	Section 3
E.	The environmental information required under subpart 3.	Section 4
F.	The names of the owners of the property for each proposed site.	Appendix C
G.	The engineering and operational design for the large electric power generating plant at each of the proposed sites.	Section 3.5
H.	A cost analysis of the large electric power generating plant at each proposed site, including the costs of constructing and operating the facility that are dependent on design and site.	Section 3.10
I.	An engineering analysis of each of the proposed sites, including how each site could accommodate expansion of generating capacity in the future.	Section 3.8
J.	Identification of transportation, pipeline, and electrical transmission systems that will be required to construct, maintain, and operate the facility.	Section 3.5
K.	A listing and brief description of federal, state, and local permits that may be required for the project at each proposed site; and	Section 2.5 Table 2-1

Authority	Required Information	Location in this Application
L.	A copy of the Certificate of Need for the project from the Public Utilities Commission or documentation that an application for a Certificate of Need has been submitted or is not required.	Exemption language included in Section 2.1
Minn. R. 7850.1900, Subp. 1	Route permit for HVTL	
A.	A statement of proposed ownership of the facility as of the day of filing and after commercial operation	Section 1.2.1 Section 1.2.2
B.	The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	Section 1.2 Section 1.2.2
C.	At least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the sit	Alternatives not required under alternative process (Minnesota Statutes 216E.04, Subdivisions 2 and 3)
D.	A description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	Section 3.5
E.	The environmental information required under subpart 3	Section 4
F.	Identification of land uses and environmental conditions along the proposed routes	Section 4
G.	The names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix C
H.	United States Geological Survey topographical maps or other maps acceptable to the commission showing the entire length of the high voltage transmission line on all proposed routes	See attached Maps
I.	Identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way with the proposed line	Section 4.2.12
J.	The engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	Section 3.5 Section 4.2.2
K.	Cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route	Section 3.10
L.	A description of possible design options to accommodate expansion of the high voltage transmission line in the future	Section 3.8
M.	The procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line	Section 3.6.3
N.	A listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	Section 2.5 Table 2-1
O.	A copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	Gen-Tie Line is exempt from the CN under Minn. Stat. § 216B.243, subd. 8(a)(10)
Minn. R. 7850.1900 Subp. 3	Environmental Information	

Authority	Required Information	Location in this Application
A.	A description of the environmental setting for each site or route.	Section 4.1
B.	A description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services.	Section 4.2
C.	A description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.	Section 4.3
D.	A description of the effects of the facility on archaeological and historic resources;	Section 4.4
E.	A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna.	Section 4.5
F.	A description of the effects of the facility on rare and unique natural resources.	Section 4.5.8
G.	Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route.	Section 4.9
H.	A description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.	Section 4