

BYRON SOLAR PROJECT

Joint Application to the Minnesota Public Utilities Commission for a Site Permit and a Route Permit



MPUC Docket Number Site Permit: IP-7041/GS-20-763
MPUC Docket Number Route Permit: IP-7041/TL-20-765

August 27, 2021



Joint Application to the Minnesota Public Utilities Commission for a Site Permit and a Route Permit

**200 MW Large Electric Generating Facility and
345 kV High Voltage Transmission Line Project**

Byron Solar Project
Dodge and Olmsted Counties, Minnesota

MPUC Docket Number Site Permit: IP-7041/GS-20-763
MPUC Docket Number Route Permit: IP-7041/TL-20-765

Prepared for:

Byron Solar, LLC
10 NE 2nd Street, Suite 400
Minneapolis, MN 55413

Prepared by:

Westwood Professional Services, Inc.
12701 Whitewater Drive, Suite 300
Minnetonka, MN 55343

August 27, 2021

Project Name: Byron Solar Project
Project Location: Dodge and Olmsted Counties
Applicant: Byron Solar, LLC
Authorized Representative: Mr. Scott Wentzell

Signature:

DocuSigned by:

D05332F079DD458...

Company: EDF Renewables, Inc.
Address: 10 NE 2nd Street, Suite 400, Minneapolis, MN 55413
Phone: (612) 486-4523
Fax:
Email: scott.wentzell@edf-re.com

Preparer of Application: Mr. David Weetman

Signature:



Company: Westwood Professional Services, Inc.
Address: 12701 Whitewater Drive, Suite 300, Minnetonka, MN 55343
Phone: (952) 937-5150
Fax: (952) 937-5822

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Definitions and Abbreviations

AIMP	Agricultural Impact Mitigation Plan
Alternating Current (AC)	The direction of current flowing in a circuit is constantly being reversed back and forth. See also Direct Current.
amsl	Above mean sea level
Annual Average Daily Traffic (AADT)	A measure used primarily in transportation planning and transportation engineering. Traditionally, it is the total volume of vehicle traffic of a highway or road for a year divided by 365 days.
Applicant or Byron Solar	Byron Solar, LLC
Application	Site Permit and Route Permit Joint Application
AQI	Air Quality Index
ARMER	Allied Radio Matrix for Emergency Response
APLIC	Avian Power Line Interaction Committee
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
CAA	Clean Air Act
CN	A Certificate of Need is a document that includes forecast information upon which the alleged need for development of a new Large Electric Power Generating Plant (LEPGP) is based in Minnesota
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO ₂	Carbon dioxide
COD	Construction operation date
C&I	Commercial and industrial customer demand for additional renewable energy resources
Commission	Minnesota Public Utilities Commission
Conductor	A material or object that permits an electric current to flow easily.
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
Commission	Minnesota Public Utilities Commission
CUP	Conditional Use Permit
CSAH	County State Aid Highway
CWA	Clean Water Act
CWI	County Well Index
dBA	A-weighted decibels

dbh	Diameter at breast height
Decibel (dB)	A logarithmic unit used to express the absolute level of sound pressure, using the ratio between power and intensity.
Direct Current (DC)	The unidirectional flow of electric charge. Direct current is produced by sources such as batteries and solar cells.
DPP	MISO Definitive Planning Phase
Development Area	Approximate 1,552.6 acre area where the Applicant proposes to build the Solar Facility
DWSMA	Drinking Water Supply Management Area
Easement	A permanent right authorizing a person or party to use the land or property of another for a particular purpose.
Ecological Classification System (ECS)	A system ecological mapping and landscape classification developed by the Minnesota Department of Natural Resources and the U.S. Forest Service.
EDFR	EDF Renewables, Inc.
Electromagnetic	The term describing the relationship between electricity and magnetism; a quality that combines both magnetic and electric properties.
Electromagnetic Field (EMF)	The combination of an electric and magnetic fields.
Extremely Low Frequency (ELF)	Includes alternating current (AC) fields and other electromagnetic, non-ionizing radiation from 1 Hz to 300 Hz. ELF fields at 60 Hz are produced by power lines, electrical wiring, and electrical equipment.
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EQB	Minnesota Environmental Quality Board
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FM	Frequency Modulation
FPPA	Farmland Protection Policy Act
GIA	Generator Interconnection Agreement
GIS	Geographic Information System
GPS	Global Positioning System
Grounding	To connect electrically with a ground; to connect some point of an electrical circuit or some item of electrical equipment to earth or to the conducting medium used in lieu thereof.
Habitat	The place or environment where a plant or animal naturally or normally lives and grows.
HSG	Hydric Soil Group
HVTL or Transmission Line	The proposed 3-mile 345 kilovolt High Voltage Transmission Line or Transmission Line and associated facilities to support the Solar Facility.

HVTL Proposed Route or Proposed Route	The 52.7 acres of physical land area with a 150-foot right-of-way (75 feet on both sides of the transmission line centerline) over which easement rights are required to safely construct, operate, and maintain a transmission line.
Inverter	An electronic device or circuitry that changes direct current (DC) to alternating current (AC).
IPaC	Information for Planning and Consultation via the U.S Fish & Wildlife Service
IPP	Independent Power Producer
kV	kilovolt
kV/m	kilovolts per meter
L 10	Ten Percent of Any Hour
L 50	Fifty Percent of Any Hour
Land Control Area	Parcels that have lease agreements with the Applicant and may extend beyond the Solar Facility boundary.
LEF	Large Energy Facility
LEPGP	Large Electric Power Generating Plant - electric power generating equipment and associated facilities designed for or capable of operation at a capacity of 50,000 kilowatts or more.
Large Generator Interconnection Agreement (LGIA)	The process service providers follow to interconnect generation resources with the Minnesota transmission system. This business practice identifies the qualification criteria, forms, submission procedures along with expected steps and timing leading up to interconnection.
LRR	Land Resource Regions
Magnetic Field	The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected. The field that is produced when current flows through a conductor or antenna.
MBS	Minnesota Biological Survey
MBTA	Migratory Bird Treaty Act
MDA	Minnesota Department of Agriculture
MDOC	Minnesota Department of Commerce
MDH	Minnesota Department of Health
Megawatt hours (MWh)	Equal to 1,000 kilowatts of electricity used continuously for one hour. It is about equivalent to the amount of electricity used by about 330 homes during one hour.
Megawatt (MW)	A megawatt is a unit for measuring power that is equivalent to one million watts.
MilliGauss (mG)	A <i>milligauss</i> is a unit of measurement of the density of a magnetic field. Magnetic fields depend on current.
MISO	Midcontinent Independent System Operator
MLRA	Major Land Resource Area

MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classifications
NESC	National Electric Safety Code
NHD	National Hydrography Dataset
NPDES	As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point and nonpoint sources that have potential for the discharge of pollutants into Waters of the United States
NEMA	National Electrical Manufacturer Association
NERC	North American Electric Reliability Corporation
NIEHS	National Institute of Environmental Health Sciences
NHIS	Natural Heritage Information System
NLCD	National Land Cover Database
NLEB	Northern Long-eared Bat
NO ₂	Nitrogen Dioxide
NPC	Native Plant Community
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NURP	National Urban Runoff Program
NWI	National Wetlands Inventory
O ₃	Ozone
O&M	Operations and Maintenance
OHV	Off-Highway Vehicles such as racing motorcycles, trail bikes, minibikes, dune buggies, all-terrain vehicles, jeeps, and snowmobiles. These vehicles are operated exclusively off public roads and highways on lands that are open and accessible to the public.
ORVW	Outstanding resource value waters
OSA	Minnesota Office of the State Archaeologist
PM	Particulate matter
POI	Point of Interconnect
PPA	Power Purchase Agreement
PPSA	Minnesota Statutes Chapter 216E is known as the Power Plant Siting Act
Project	Includes the Solar Facility and HVTL

Project Area	The 1,853.7 acres of land that includes the Solar Facility (1,801 acres) and HVTL (52.7 acres)
Project Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
PV	Photovoltaic
PWI	Public Waters Inventory
RIM	Reinvest in Minnesota
Route Width	The area in which the utility is allowed by the Public Utilities Commission to locate the necessary right-of-way and complete final design of the transmission facilities.
RPBB	Rusty patched bumble bee
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act
SGCN	Species of Greatest Conservation Need
SHPO	Minnesota State Historic Preservation Office
SMPA	Southern Minnesota Municipal Power Agency
SO ₂	Sulfur dioxide
SOBS	Sites of Biodiversity Significance
Solar Facility	The proposed up to 200 megawatt (MW) photovoltaic (PV) solar energy generating facility and associated systems on 1,801 acres
Solar module (module)	A set of solar photovoltaic (PV) panels electrically connected and mounted on a supporting structure.
SPCC	Spill Containment and Countermeasure Plan
SSA	Sole Source Aquifer
SSURGO	Soil Survey Geographic Database
Scientific and Natural Area (SNA)	Preserves for natural features and rare resources of exceptional scientific and educational value.
Stormwater Pollution Prevention Plan (SWPPP)	The SWPPP includes a description of all construction activity, temporary and permanent erosion, and sediment control BMPs, permanent stormwater management, and other pollution prevention techniques to be implemented throughout the life of the Project. The SWPPP includes a combination of narrative plans and standard detail sheets that address the foreseeable conditions at any stage of construction.
SWAP	State Wildlife Action Plan
SWCD	Soil and Water Conservation District
TMDL	Total maximum daily load
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish & Wildlife Service
USG	Unhealthy for Sensitive Groups
USGS	U.S. Geological Survey
VMP	Vegetation Management Plan
Voltage	A unit of electrical pressure, electric potential or potential difference expressed in volts. The term used to signify electrical pressure. Voltage is a force that causes current to flow through an electrical conductor. The voltage of a circuit is the greatest effective difference of potential between any two conductors of the circuit.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs, and similar areas.
Wetland Conservation Act (WCA)	Legislation designed to maintain and protect Minnesota's wetlands and the benefits they provide. To retain the benefits of wetlands and reach the legislation's goal of no-net-loss of wetlands, the Minnesota Wetland Conservation Act, pursuant to Minnesota Administrative Rules 8420, requires anyone proposing to drain, fill, or excavate a wetland first to try to avoid disturbing the wetland; second, to try to minimize any impact on the wetland; and, finally, to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation
WHPA	Wellhead Protection Area
WMA	Wildlife Management Areas are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses.
WNS	White-Nose Syndrome

1.0 Introduction

Byron Solar, LLC (Byron Solar or Applicant), a wholly owned subsidiary of EDF Renewables, Inc. (EDFR), proposes to construct and operate an up to 200 megawatt (MW) photovoltaic (PV) solar energy generating facility and associated systems (Solar Facility). In addition, the Applicant is proposing to construct a 345 kilovolt (kV) high voltage transmission line and associated facilities (HVTL or Transmission Line) to interconnect the Solar Facility to the transmission grid.

The proposed Solar Facility and HVTL (together, Project) are planned to be constructed in the townships of Mantorville and Canisteo in Dodge County, Minnesota, and Kalmar Township in Olmsted County, Minnesota (Map 1). The Applicant is anticipating construction to begin in 2023 with commercial operation by the end of 2024.

Construction of the Project requires a Site Permit and Route Permit from the Minnesota Public Utilities Commission (Commission or MPUC). The Applicant respectfully submits this Joint Application for a Site Permit and Route Permit to the Commission. The Site Permit and Route Permit are the only site approvals needed for construction of the Project (Minn. Stat. § 216E.10, subd. 1). The Site Permit and Route Permit Completeness Checklist is provided in Appendix A. See Sections 1.4.3 and 1.4.4 for additional information.

The Project is also a large energy facility (LEF) as defined in Minnesota Statutes §216B.2421, subd. 2(1) and a large electric generating facility (LEGF) as defined in Minnesota Rules 7849.0010, subp. 13, and therefore requires a Certificate of Need (CN) from the Commission prior to construction. A CN application will be submitted separately to the MPUC in Docket No. IP-7041/CN-20-764 (Section 1.4.2).

Solar Facility

The proposed Solar Facility consists of solar panels mounted on galvanized steel and aluminum racking systems installed on driven piles or ground screws for the foundations. A linear ground-mounted single-axis tracking system will allow the solar panels to track the sun from east to west maximizing energy production. Solar panels will be accessible via a network of gravel access roads for maintenance purposes, and the portions of the facility occupied by equipment will be surrounded by security fencing (Appendix B; Map 3). Stormwater from the site will be managed through a series of planned stormwater ponds. Detailed Solar Facility maps are in Appendix B; Map 4.

The Solar Facility is situated on approximately 1,801 acres of predominantly agricultural land and refers to all land within the Solar Facility boundary under agreement with a landowner. References to “Development Area” refers to portions of the Solar Facility hosting solar equipment. The preliminary Project design shows a Development Area of 1,552.6 acres within the proposed fence as shown on Figure 1 and Map 3. The remaining 248.4 acres are not hosting solar equipment and are considered undeveloped land. The Applicant also has lease agreements with landowners whose parcels extend beyond the Solar Facility boundary. Combined with the Solar Facility, this area is referred to as the Land Control Area.

Energy from the solar panels will be directed through an underground electrical collection system to inverters where the power is converted from direct current (DC) to alternating current (AC) power. A new Project Substation will be constructed as part of the Solar Facility and will be located just south of U.S. Highway 14 near 640th St/265th Ave in Dodge County. See section 5.1.2

for details on the electrical collection system, and section 5.1.3 for details on the Project Substation.

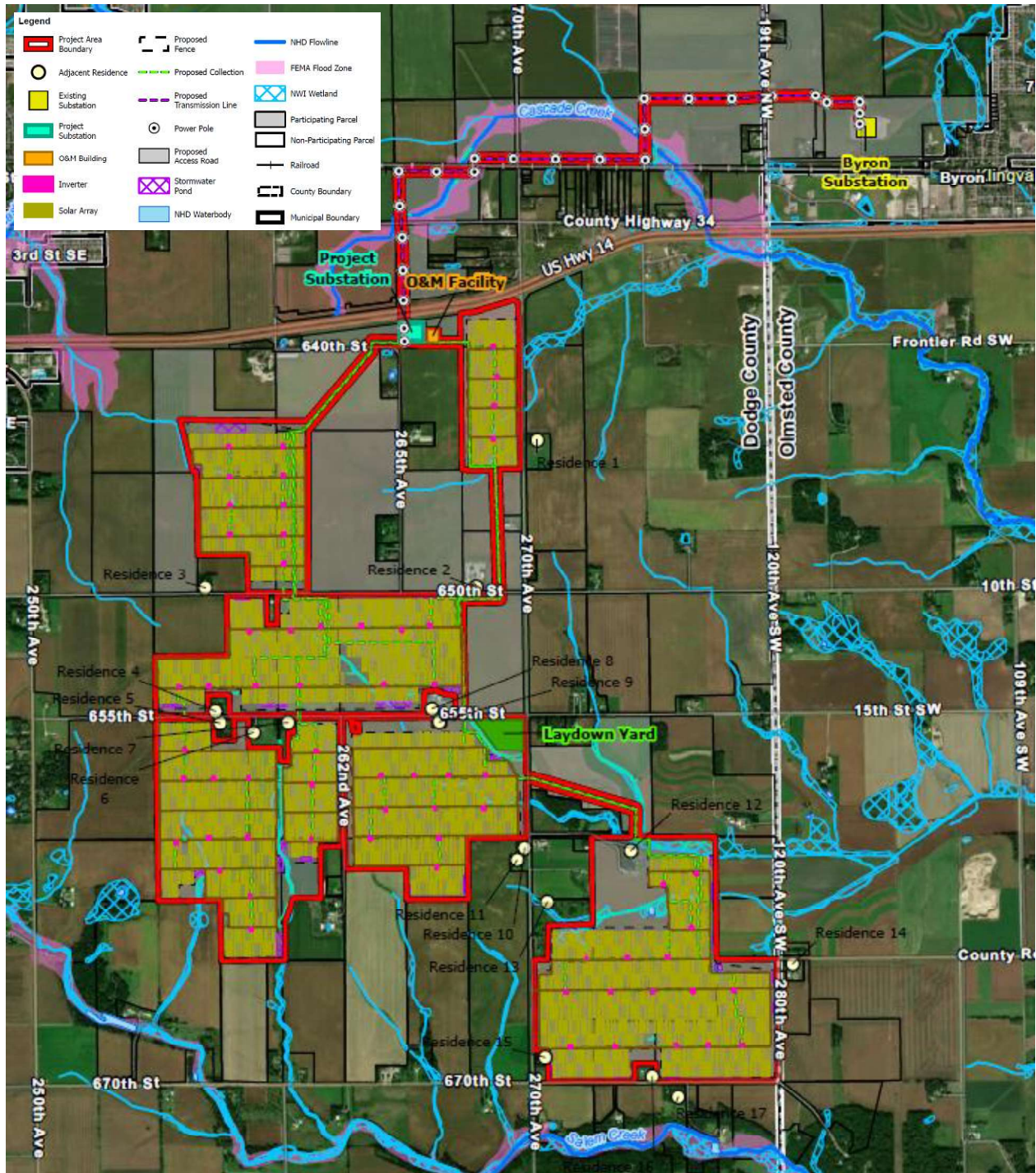


Figure 1: Proposed Solar Facility and HVTL Route Map

HVTL

The proposed HVTL route begins at the new Project Substation then travels generally north and east for approximately three miles to connect to the existing Southern Minnesota Municipal Power Agency (SMMPA) Byron Substation in Olmsted County (See Figure 1 and Map 1). Two medium power transformers located near the center of the proposed Project Substation will step-up the power generated from the Solar Facility from 34.5 kV to 345kV. From the Project Substation, the HVTL will carry power to the Byron Substation located immediately adjacent to the eastern end of the Transmission Line where it will connect to the energy grid. Section 2.2.3 provides a detailed description of the HVTL, and Map 2 shows the HVTL Proposed Route and pole locations.

References to the “HVTL Proposed Route” within this Application refers to the 3-mile 345 kV Transmission Line for which the Applicant is seeking voluntary easement agreements with milestones for construction/payments. The Applicant has acquired a 150-foot-wide permanent right-of-way along the Proposed Route. The Applicant has secured 100 percent of the total necessary private easements from landowners for the 52.7 acres of right-of-way required for the Proposed Route.

1.1 Purpose and Need

The Project is needed to meet the growing commercial and industrial customer (C&I) demand for additional renewable energy resources, to accommodate the Solar Energy Standard set forth in Minnesota Statutes and to meet other clean energy requirements in Minnesota and neighboring states. The Project will provide cost-effective solar energy and help meet the Minnesota Renewable Energy Objectives (Minn. Stat. § 216B.1691). The Applicant is working towards securing a Power Purchase Agreement (PPA) for the Project.

The Project will provide up to 200 MW of capacity and roughly 435,000 megawatt hours (MWh) annually of clean and reliable electricity. The power generated by the Project will be offered for sale to wholesale customers, including Minnesota utilities and cooperatives that have identified a need for additional renewable energy and capacity, and commercial and industrial customers that have set clean energy goals. According to the United States Environmental Protection Agency’s (USEPA’s) Greenhouse Gas Equivalencies Calculator (USEPA, 2021a), the Project will offset approximately 307,563 metric tons of carbon dioxide (CO₂), the equivalent of 66,447 passenger vehicles driven for one year, 338.9 million pounds of coal burned, and 35,491 homes’ energy consumption for one year.

The Applicant filed a Generator Interconnection Agreement (GIA) application with MISO identified as J1124 for 100 MWs and J1534 for 100 MWs. MISO is an independent, not-for-profit organization that delivers electric power across 15 states. Approval from MISO through a GIA is required to connect the Solar Facility to the electrical transmission system. The Applicant entered the interconnect request into the MISO Definitive Planning Phase (DPP) study process for J1124 in 2018 and J1534 in 2020. The Applicant expects to sign a GIA for J1124 in December 2021 and J1534 in July 2022.

The Applicant proposes to interconnect the Project at the existing Byron Substation in Olmsted County, Minnesota (see Map 1). This interconnection will provide sufficient outlet to accommodate all the solar energy generation from the Solar Facility and is described in more detail in Section 5.1.3.

1.2 Applicant Information

The permittee for this Application is:

Byron Solar, LLC
10 NE 2nd Street, Suite 400
Minneapolis, MN 55413

The contact persons regarding this Application are:

Scott Wentzell
EDF Renewables, Inc.
10 NE 2nd Street, Suite 400
Minneapolis, MN 55413
Telephone: 612.486.4523
Email: scott.wentzell@edf-re.com

Christina K. Brusven
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402
Telephone: 612-492-7000
Email: cbrusven@fredlaw.com

1.2.1 Ownership at Time of Filing

Byron Solar is an independent power producer and wholly owned subsidiary of EDFR. EDFR is a renewable energy development company that will construct, own, and operate the proposed Project. EDFR is a world leader in renewable energy electricity generation with its United States headquarters located in San Diego, California. EDFR is a market leading independent power producer and service provider that delivers grid-scale power, including wind, solar photovoltaic, and storage. EDFR develops, builds, and operates clean energy power plants in more than 20 countries. EDFR has developed 16,000 MW in North America and has 11,000 MW currently under a long-term operations & maintenance contract. Since 2016, our projects have contributed more than \$104 million in leaseholder payments and generate enough power to offset approximately 1.6 million homes.

1.2.2 Proposed Ownership after Commercial Operations

Byron Solar will own, operate, and maintain the Project following the start of commercial operations. Although not planned at this time, EDFR and Byron Solar reserve the right to sell or assign the Project to another qualified entity at any time before, during or after the Project is constructed. A transfer of the Site Permit and Route Permit would require approval by the Commission. Any future buyer or assignee will be required to meet the Site Permit and Route Permit conditions.

1.3 Project Schedule

In order to meet the Project's commercial operation date (COD) of Q4 of 2024, the following schedule is anticipated moving forward for the various phases of development. This Project schedule is an estimate based on information known at the time of application. The actual

timeline for each activity will be determined by a number of factors including, but not limited to, timing and completion of PPA arrangements, interconnect facilities, equipment availability and permitting timelines.

Table 1: Project Schedule

Activity	Description	Timeline
Interconnection Request	Approval from the Midcontinent Independent System Operator (MISO) to connect the project to the grid.	Request made in Q2 2018. The Applicant expects to sign Generator Interconnection Agreements (GIA) with MISO between Q4 2021 and Q2 2022.
Land Acquisition	Acquire leases, easements, and purchase agreements necessary for development of the Project.	Began Solar Facility land campaign in Q3 2018 and HVTL land campaign in Q2 2020. The Project currently has executed agreements for the land needed to construct both the Solar Facility and HVTL.
Field Surveys	Field surveys conducted within the Solar Facility and HVTL route for wetlands, native prairies, and cultural resources.	Field surveys initiated in Q4 2020 and completed in Q2 2021.
Site Permit, Route Permit, and Certificate of Need (CN)	CN, Site Permit and Route Permit issuance for the Project.	Anticipated Q2/Q3 2022.
Other Permits	Acquisition of all federal, state, local, and tribal government permits and approvals necessary for construction and operation of the Project.	The Applicant is working with applicable regulatory authorities to obtain the necessary permits/approvals by the end of the Q3 2022.
Equipment and Contractor Acquisition	Procurement of project equipment including, but not limited to, panels, trackers, inverters, transformers, and steel monopoles. Final contractor selections will be made contingent on the Joint Site and Route Permit Application being approved by the Commission.	Between Q3/Q4 2022.
Construction	The Applicant will oversee the primary contractors performing construction of the Project. These construction activities will include access road building, solar array assembly, electrical,	Begin Q1 2023 and end Q4 2024.

Table 1: Project Schedule

Activity	Description	Timeline
	transmission, and communications installation work. The Applicant anticipates beginning construction of the Project soon after being granted a CN, Site Permit, and Route Permit by the MPUC and fulfilling necessary pre-construction compliance requirements.	
Testing and Commissioning	Testing and commissioning of project related equipment.	End of construction and prior to the start of commercial operation – Q3/Q4 2024.
Operation	Commercial operation of the solar facility and transmission line following construction and testing/commissioning activities are completed.	Q4 2024.
Project Extension or Decommissioning		2060 or later.

1.4 Required Project Permits

Project development will likely require several federal, state, and local permit approvals prior to construction. Potential permits, with respect to their prospective applicability and expected timing, are detailed below in Table 2.

Table 2: Potential Permits/Approvals

Agency	Permit	Applicability	Permit Status & Timing
Federal			
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	Dredging or filling jurisdictional Waters of the United States (wetlands/waterways)	To be obtained prior to construction, as needed
	Wetland and Waters Delineation Approval	Needed to determine extent of U.S. Army Corps of Engineers (USACE) jurisdiction, quantify impacts, or document avoidance.	To be obtained prior to construction, as needed
	Approved Jurisdictional Determination (AJD)	An AJD is optional at the applicant's request – an AJD is not necessary for the USACE to process an application.	To be obtained prior to construction, as needed
	Preliminary Jurisdictional Determination (PJD)	A PJD is optional at the applicant's request - a PJD is not necessary for the USACE to process an application.	To be obtained prior to construction, as needed
U.S. Fish and Wildlife Service (USFWS)	Section 7 Endangered Species Act (ESA) Consultation	Any Project with a federal nexus that may adversely affect a federally listed endangered, threatened, or candidate species as determined by the lead federal agency.	The Applicant is unaware of a federal nexus on the project but will pursue if needed.
	Section 10 Endangered Species Incidental Take Permit (ITP)	Potential impacts on federally endangered or threatened species.	To be obtained prior to construction, as needed
U.S. Environmental Protection Agency (USEPA)	Spill Prevention, Control, and Countermeasure (SPCC) Plan	Project facilities with oil storage of more than 1,320 gallons	To be obtained prior to construction, as needed

State			
Minnesota Public Utilities Commission (MPUC)	Certificate of Need	Required for LEFs (electric power generating plant or combination of plants at a single site with a combined capacity of 50 MWs or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system).	To be obtained prior to construction and filed concurrent with the Site Permit and Route Permit Joint Application
	Site Permit	Site Permit required for Large Electric Generating Facilities greater than 50 MW.	To be obtained prior to construction
	Route Permit	Route Permit required for High Voltage Transmission Lines (HVTL) of 100kV or more and greater than 1,500 feet in length.	To be obtained prior to construction
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits.	To be obtained prior to construction, as needed
	National Pollutant Discharge Elimination System General Permit and Stormwater Pollution Prevention Plan	Construction activity that disturbs one or more acre of soil.	To be obtained prior to construction
Minnesota Department of Health (MDH)	Well construction permit	Installation of a water supply well.	To be obtained prior to construction (for O&M building), as needed
Minnesota Department of Labor and Industry	Electrical inspection of installed equipment	Necessary to comply with state electrical codes	Inspection to be conducted during construction and prior to operation
Minnesota Department of Natural Resources (MNDNR)	Water Appropriation/ Dewatering Permit	Required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year (dewatering)	To be obtained prior to construction, as needed
	Consultation and Review of State Threatened and Endangered Species	Potential effects on State threatened and endangered species.	To be obtained prior to construction, as needed

Minnesota DNR, Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure.	To be obtained prior to construction, as needed
Minnesota State Historic Preservation Office (SHPO)	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require State permits or affect State register properties or require Section 106 compliance.	Obtain Phase I inventory concurrence prior to construction
Minnesota Department of Transportation (MnDOT)	Application for Utility Accommodation on Trunk Highway Right-of-Way	Installing utilities along, across or within trunk highway right-of-way.	To be obtained prior to construction, as needed
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of- way.	To be obtained prior to construction, as needed
	Oversize/ Overweight Permit	Vehicles delivering equipment, materials and supplies that exceed applicable MnDOT height/length limits and weight limits.	To be obtained prior to equipment deliveries, as needed
County/Local			
Dodge County	Septic System Permit	Required prior to installation of any septic system in Dodge County.	To be obtained prior to construction, as needed
	Moving Permit	Required for transporting oversized and overweight loads on County roadways.	To be obtained prior to construction, as needed
	Application for Driveway/ Entrance	Required for moving, widening or creation a new driveway access to County roads.	To be obtained prior to construction, as needed
	Work in the right-of- way permit	Required to work within county state aid highways, county municipal streets, and county highway rights-of- way.	To be obtained prior to construction, as needed
	Utility Permit	Required for installation of a utility, tile inlet/outlet, or other object of any kind within the right-of-way.	To be obtained prior to construction, as needed

	Zoning Permit	Required for accessory solar energy system structures.	To be obtained prior to construction, as needed
Olmsted County	Oversize/Overweight Vehicle Permit	Required for transporting oversized and overweight loads on County roadways.	To be obtained prior to construction, as needed
	Access Permit	Required for any changes to driveway access along county highways.	To be obtained prior to construction, as needed
	Utility Permit	Required for work in the county highway road rights-of-way.	To be obtained prior to construction, as needed
	Minnesota Wetland Conservation Act Approval	Activities affecting water resources	To be obtained prior to construction, as needed
Dodge County Soil and Water Conservation District (SWCD)	Minnesota Wetland Conservation Act Approval	Activities affecting water resources	To be obtained prior to construction, as needed
Olmsted County Soil and Water Conservation District (SWCD)	Minnesota Wetland Conservation Act Approval	Activities affecting water resources	To be obtained prior to construction, as needed
Canadian Pacific Railway (CPR) Crossing	Utility or right-of-way access	Approvals needed to work under, over, or beside Canadian Pacific Railway tracks.	To be obtained prior to construction, as needed

1.4.1 Local Approvals

Pursuant to Minn. Stat. § 216E.10, subd. 1, the issuance of a site or route permit, and subsequent purchase and use of the site or route locations for large electric power generating plant and high voltage transmission line purposes, is the sole site or route approval required to be obtained. The site permit and route permit supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

In Dodge County, the Solar Facility and HVTL are zoned as Agricultural District in Canisteo Township (Dodge County, 2014) and Mantorville Township (Dodge County, 2018). In Olmsted County, the HVTL route is zoned as A-2 Agricultural Protection District (Olmsted County, 2021a). Map 14 shows the zoning districts for the Solar Facility and HVTL.

The Applicant has consulted with local officials from early in the development process and will strive to incorporate feedback and reasonable recommendations of local stakeholders into the final design of the Project. A summary of public and regulatory outreach is described in Section 7.0.

1.4.2 Certificate of Need

Minn. Stat. § 216B.243 states that a 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;” and “any high-voltage transmission line with a capacity of 200 kilovolts or more and greater than 1,500 feet in length.”¹ Accordingly, a CN is required for the Solar Facility and the Transmission Line. The Applicant will submit a CN application to the MPUC for the Project under docket number IP-7041/CN-20-764.

1.4.3 Site Permit

A Site Permit is required for a solar energy generating system that is greater than 50 MW. The Solar Facility falls within this definition and will require a Site Permit from the Commission prior to construction (Minn. Stat. § 216E.03, subd. 1).

Pursuant to Minn. Stat. § 216E.04, subd. 2(8), Byron Solar seeks approval of its Application under the alternative review process provided for under Minn. Stat. Sec. 216E.04 and Minn. R. 7850.2800 to 7850.3900. The Applicant filed a Notice of Intent to Submit a Site Permit application under the Alternative Permitting Process to the Commission on June 4, 2021.

Additionally, the Applicant submitted a Solar Size Determination request to the Minnesota Department of Commerce (MDOC) Energy Environmental Review and Analysis for a solar energy generating system size determination on October 12, 2020 in accordance with Minn. Stat. § 216E.021, subd. a. The size determination response from the MDOC was issued on October 20, 2020, and is provided in Appendix C.

1.4.4 Route Permit

A Route Permit is required for high-voltage transmission lines greater than 100 kV and 1,500 feet in length. The HVTL Project falls within this definition and will require a Route Permit from the Commission prior to construction (Minn. Stat. § 216E.03, subd. 2).

Pursuant to Minn. Stat. § 216E.04, subd. 2(4), and as specified in Minn. R. 7850.2800 to 7850.3900, HVTL projects greater than 200 kV and less than 5 miles in length qualify for the alternative review process, which eliminates the obligation for an applicant to propose alternative routes within a Route Permit application. In developing the HVTL route, the Applicant evaluated alternate routes as described in Section 4.4. The Applicant filed a Notice of Intent to Submit a Route Permit application under the Alternative Permitting Process to the Commission on June 4, 2021.

1.4.5 Other Potential Permits and Approvals

The Applicant will obtain all permits, licenses, and approvals that are required following issuance of the CN, Site Permit, and Route Permit. The permits or approvals potentially applicable for the construction and operation of the Project are shown in Table 2 above. Copies of agency correspondence are included in Appendix C.

¹ Minn. Stat. § 216B.2421, subsd. 2(1), and 2(2).

1.4.6 Request for Joint Proceeding with Certificate of Need

The Applicant has prepared this joint application for a site permit and route permit as authorized under Minn. R. 7850.1600.

As described above, the Applicant will apply for a CN for the Project (Docket No. IP-7041/CN-20-764). Minn. Stat. § 216B.243, subd. 4 and Minn. R. 7849.1900, subp. 4, permit the Commission to hold joint proceedings for a CN and site or route permit in circumstances where a joint hearing is feasible, more efficient, and may further the public interest. As such, the Applicant respectfully requests that the Commission order joint proceedings for the review of the Applicant's CN and Joint Site Permit and Route Permit Applications. Holding joint proceedings is in the public interest because it will make it easier for members of the public to participate in applicable meetings and hearings, provide a comprehensive record regarding potential benefits, impacts and minimization measures and improve administrative efficiency for agency staff reviewing these applications.

2.0 Project Information

The following provides a description of the Solar Facility and HVTL, and proposed Project infrastructure including land control, Project design, interconnection, equipment selections, prohibited areas, alternatives, costs, and potential future expansions.

2.1 Overall Project Description

The Project is generally located between the cities of Byron and Kasson in southeastern Minnesota. Combined, the Solar Facility and HVTL encompass 1,853.7 acres (Project Area).

The proposed Solar Facility is located on approximately 1,801 acres of predominantly agricultural land in the townships of Mantorville and Canisteo in Dodge County. The Applicant has secured lease agreements for 100 percent of land for the proposed Solar Facility. The final Solar Facility design is expected to occupy approximately 1,552.6 acres or less (see Map 2). The excess acreage (248.4 acres) allows for planned buffers and flexibility in overall design. An additional 1,227 acres beyond the Solar Facility boundary has also been secured through easements and lease agreements. In total, the Applicant has secured 3,028 acres of lease agreements and easements, which is referred to as the Land Control Area.

The proposed HVTL route is located on predominantly agricultural land in Mantorville Township in Dodge County, and Kalmar Township in Olmsted County. The HVTL will connect to the Solar Facility via the Project Substation located just south of U.S. Highway 14, near 640th St and 265th Ave, in Dodge County (see Map 1). The Applicant has secured 100 percent of the total necessary private easements from landowners for the 52.7 acres of right-of-way required for the Proposed Route. Table 3 summarizes the acreages of the Solar Facility and HVTL components.

Table 3: Project Components

Component	Acreage
Solar Facility¹	
Solar Arrays (fenced area)	1,271.2
Access Roads ²	152.7
Buried Electrical Collection Lines	90.2
Inverters	0.2
O&M Facility	2.6
Project Substation	6.8
Stormwater Basins	16.6
Laydown Yard (temporary)	12.2
Total	1,552.6
Undeveloped Area³	
	248.4
Total	1,801
HVTL	
Transmission Line Right-of-Way ⁴	52.7
Total	52.7
Project Total	1,853.7
¹ The Solar Facility Development Area includes the area within the Solar Facility that is hosting solar equipment and will be surrounded by a fence. The Development Area, based on the Project's preliminary design, includes access roads (including those extending beyond the Solar Facility boundary), buried electrical collection lines, inverters, an O&M Facility, Project Substation, stormwater basins, and a temporary laydown yard for a total of 1,552.6 acres. ² Access roads will be up to 16 feet wide and were buffered an additional 20 feet to account for potential realignments based on final engineering plans. ³ The Undeveloped Area includes all areas outside the fenced area but within the Solar Facility (1,801 acres). ⁴ The Transmission Line right-of-way acreage includes a 75-foot buffer on both sides of the transmission line centerline.	

2.2 Solar Facility and HVTL Description

2.2.1 Location

The Applicant is proposing to build the Solar Facility in Canisteo and Mantorville townships in Dodge County. The HVTL is proposed to be built within Mantorville Township in Dodge County, and Kalmar Township in Olmsted County, Minnesota. Map 1 depicts the location of the proposed Project, project facilities, and the existing Byron Substation. Table 4 provides the Township, Range, and Section of areas included within the respective political boundaries.

A participating landowner list, as required by Minn. R. 7850.1900, subp. 1(F) is provided in Appendix F, and participating parcels are shown on Map 2.

Table 4: Project Location

Component/County	Township	Range	Section (s)
Solar Facility			
Dodge	106N	16W	2, 3, 10, 11, 12, 13, 14, 15
	107N	16W	35
HVTL			
Dodge	107N	16W	25, 35, 36
Olmsted	107N	15W	31

The Applicant believes the selected Project location in Dodge County is advantageous for solar development based upon a good solar resource, willing landowner participants, consistency with local land use designations and zoning, the proximity to existing electric transmission infrastructure, and minimal impact to natural and cultural resources.

2.2.2 Solar Site Size and Capacity

The Applicant has 100 percent land control for the Solar Facility, which is 1,801 acres of private land under lease. Based on preliminary project design, the Applicant estimates that 1,552.6 acres of the 1,801 acres is necessary to accommodate the final design of the up to 200 MW Solar Facility Project (Development Area). The Development Area is generally defined as the area within the security fencing and includes the access roads (including those extending beyond the Solar Facility fenced area), buried electrical collection lines, inverters, an O&M Facility, Project Substation, stormwater basins, and a laydown yard. Maps 3 and 4 depict the preliminary layout and associated infrastructure of the proposed Solar Facility. Additional information on the proposed facility design and layout can be found in Section 5.1.

The Applicant has designed an efficient 200 MW solar PV system using ground-mounted linear single-axis trackers. Energy losses and wiring requirements have been minimized by strategically placing inverters and optimizing the electrical collection system. The Solar Facility uses 1,552.6 acres of the 1,801 acres within the Solar Facility boundary, minimizing impacts to land and vegetation by reducing the amount of land needed to generate 200 MW of energy and by reducing the length of the transmission line needed to connect the Solar Facility to the Byron Substation.

While equipment selection has not been finalized, the Applicant plans to use the JA Solar 510W MBB Half-cell Solar Module (JAM72D30 510/MB) mounted on single axis trackers with the SMA Solar Technology 4200 UP-US inverter in the provided site layout. The JA Solar 510W Solar Module is assembled with high efficiency 11BB PERC cells that deliver higher power output, better temperature-dependent performance (operates between -97.25 °F and 185 °F), reduced shading effect on the energy generation, lower risk of hot spot, and enhanced tolerance for mechanical loading from one of the leading companies in the solar industry. While the current design anticipates JA Solar technology, other panels and manufactures are under consideration. Any changes in technology moving forward are anticipated to build upon current Solar Facility efficiencies presented in this Application.

The Solar Facility's main components include PV panels mounted on a single axis tracking system and solar inverters. The galvanized steel and aluminum racking systems will be installed

on driven piles or ground screws for the foundations and are not anticipated to require concrete; however, some concrete foundations may be needed depending on location and specific soil conditions. Associated facilities include electrical cables, conduit, switchgear, step up transformers, supervisory control and data acquisition (SCADA) system, and metering equipment. The Solar Facility will be fenced and gated for security.

After construction is complete, disturbed areas will be seeded with a beneficial seed mix to enhance soil and water retention and reduce stormwater runoff and erosion throughout the Solar Facility. The Applicant will work collaboratively with the MNDNR to maximize the opportunity to establish and manage the vegetation at the Project site pursuant to the Agricultural Impact Mitigation Plan (Appendix D) and the Vegetation Management Plan (Appendix E).

2.2.3 HVTL Size and Description

The 345 kV HVTL will be approximately 3 miles long and will connect the Project Substation to the existing Byron Substation. The Applicant has been working to acquire voluntary easements for the Proposed Route and has secured 100 percent of the total necessary private easements.

The anticipated design of the HVTL consists of 24 steel monopoles with a typical height range from 90 feet to 170 feet above the ground with spans of approximately 232 to 974 feet. The entire HVTL route will include a 150-foot-wide right-of-way (75 feet on each side of the proposed HVTL route centerline), supporting the path of the transmission line. As mentioned in Section 1.0, the route will start at the Project Substation and end at the Byron Substation. Pole heights will vary along the route based on topography, type of pole used and location, and the crossing of roads, railroad tracks, and existing infrastructure. See Section 5.1.4 for details on the HVTL.

The HVTL will be designed to meet the minimum requirements as set forth by the National Electric Safety Code (NESC), satisfying NESC Heavy District requirements for Grade B construction.

2.3 Cost Analysis

Solar Facility

The Solar Facility is estimated to cost about \$252.8 million. The amount is an engineering estimate and expected to reflect actual Solar Facility costs within approximately 20 percent. Final Solar Facility costs are dependent on a variety of factors, including timing of construction, cost of materials, and labor. Table 5 provides estimates for engineering, procurement, and construction and other anticipated expenses associated with Solar Facility construction. Operating costs are estimated to be approximately \$3.2 million dollars on an annual basis, including labor, materials, and property taxes.

HVTL

The HVTL is estimated to cost about \$3.2 million. The amount is an engineering estimate and expected to reflect actual HVTL costs within approximately 20 percent. Final HVTL costs are dependent on a variety of factors, including the approved route, timing of construction, cost of materials, and labor. Operating and maintenance costs after construction of the HVTL will be nominal for several years because the line will be new and minimal initial vegetation

management is required. The cost associated with operation and maintenance is estimated at approximately \$9,000 per year.

As stated above, if the Commission grants the necessary approvals, the Applicant will construct, operate, and maintain the proposed Solar Facility and HVTL. The principal operating and maintenance costs include inspections, which are typically ground-based, and generally on a yearly basis. Refer to the CN application (Docket No. IP-7041/CN-20-764) for more detailed information on the Applicant's cost analysis.

Table 5: Estimated Project Costs

Project Components	Cost (\$ millions)
Solar Facility	
Engineering, Procurement, Construction Contractor	\$225.5
Development Expense	\$5.0
Interconnection ¹	\$10.0
Financing	\$2.0
Project Substation	\$10.3
Subtotal	\$252.8
HVTL	
Engineering, Procurement, Construction Contractor	\$3.0
Development Expense	\$0.2
Interconnection	N/A
Financing	N/A
Project Substation	N/A
Subtotal	\$3.2
Project Total	\$256.0
¹ The Interconnection cost is dependent on costs of the MISO study.	

3.0 Solar Facility Area Selection and Constraints Analysis

EDFR conducted a detailed analysis to identify the current point of interconnect (POI) and solar site location for development. Aspects of the analysis and site search are discussed in more detail in the sections that follow. EDFR's search was limited to the southern half of the state due to the good solar resource and relatively open farmland in the region. Within the southern portion of the state, EDFR screened for substations and transmission lines with available capacity, which revealed a relatively narrow subset of possible POIs. Based on internal modeling, these sites were also anticipated to have low or no network upgrade requirements. EDFR then screened available land within approximately 5 miles of the identified POIs due to the financial limitations of constructing a longer transmission line (construction cost, easement acquisition cost, and electrical losses). Five miles of transmission was determined to be the upper limit of what a project of this size can support. Lands within the 5-mile radius of the POI were determined potentially suitable if they were: cleared and otherwise undeveloped, not currently encumbered by other easements (e.g., wind farms), contained minimal wetlands, streams, transmission lines, pipelines, roads, or other obstacles that would limit the buildable

land or lead to irregularly shaped development areas. EDFR also screened the areas for geotechnical risks, habitat for endangered species, proximity to culturally sensitive areas, other potential environmental risks such as pollutants, steep slopes, flood zones, current land use conflicts, and a clear and uncontested title. Once the potential project areas passed the above constraints tests, EDFR approached landowners to negotiate voluntary leases and easements.

EDFR identified the Byron Substation as having available capacity and low interconnection costs. The Project site was chosen over others for its proximity to the POI, supportive landowners, and no competition with other potential renewable energy projects (i.e., available land not currently participating in other renewable energy projects).

It is important to note that the Solar Energy Production and Prime Farmland Guidance was issued after the project had secured the majority of site control and begun site studies. With that said, the primary siting factors driving the location of the Solar Facility were generally as described in the document: 1) best available solar source, 2) access to the grid (access to transmission or reasonably affordable interconnection), 3) a developable site (favorable ground slope and limited environmental liability), and 4) willing landowners. These factors were considered when identifying the site and are discussed further in the sections that follow.

3.1 Prohibited and Exclusion Sites

Minn. R. 7850.4400, subp. 1 prohibits large electric power generating plans (LEPGPs) from being located in 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 their land use districts; state parks; nature conservancy preserves; state scientific and natural areas (SNAs); and state and national wilderness areas. The Project is not located in any of these prohibited areas (Map 6).

In addition, Minn. R. 7850.4400, subp 3 excludes LEPGPs from being located in any of the following areas unless there is no feasible and prudent alternative available: state registered historic sites; state historic districts; state wildlife management areas (WMAs), except in cases where the plant cooling water is to be used for wildlife management purposes; county parks; metropolitan parks; designated state and federal recreational trails; designated trout streams; and rivers identified in Minn. Stat. § 85.32, subd 1. The Project is not located in any of these prohibited areas (Map 6).

Subject to certain exceptions, Minn. R. 7850.4400, subp. 4 prohibits LEPGPs from being sited 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 200 MW net generating capacity of the Project, the prime farmland exclusion rule would allow the use of up to 100 acres of prime farmland for the Project. Approximately 1,256 acres of prime farmland and 523 acres of prime farmland if drained are located within the Project Area. These acreages of prime farmland would be temporarily taken out of agricultural production for the 35-year life of the Project but would not be permanently removed.

There is an exception to the prime farmland exclusion rule if there is no feasible and prudent alternative. About 98.8 percent of the Project is sited on prime farmland. The Applicant completed a detailed evaluation of potential alternative sites to avoid prime farmland and presents evidence that the Project qualifies for an exception to the rule (see Section 3.1.1 below). See Section 6.6.4.2 for a detailed discussion on prime farmland within the Project Area.

While not listed as a prohibited or excluded site, a designated snowmobile trail crosses the Solar Facility. See Section 6.2.9 for information on the snowmobile trail.

3.1.1 Factors Driving Choice of Region

In May 2020, the MDOC issued *Solar Energy Production and Prime Farmland: Guidance for Evaluating Prudent and Feasible Alternatives* (MDOC ERAA, 2020). The only exception to Minn. R. 7850.4400, subp. 4 is if there is no “feasible and prudent” alternative. The Guidance document recommends that the Applicant offer an explanation of the particular constraints driving the Project to be built in a region of the state that conflicts with prime farmland, and the application should: 1) describe the solar resource in the proposed region vs. otherwise compliant areas reviewed, 2) describe the process of determining available interconnection points, and 3) describe efforts in investigating developable sites (sites with appropriate topography and willing participants) in otherwise compliant areas. The prime farmland guidance document is intended to assist solar developers in defining feasible and prudent siting alternatives. While the Guidance was published after the interconnection request and most leases were signed, the Applicant has followed the guidance. The following sections describe the various factors that were considered with respect to project siting and prime farmland. The Applicant evaluated a number of alternatives. For the reasons described below, the Applicant submits that an exception to the prime farmland exclusion is warranted as the site represents the only feasible and prudent alternative. While the Project does not require an alternatives analysis, one is provided below for sake of evaluating prime farmland.

The highest solar resource in Minnesota is located in the Southern one-third of the state. The average expected Global Horizontal Irradiance in Dodge County is among the highest in the state, and within approximately 4.3 percent of the highest solar irradiance in southwestern counties. This coupled with the lower expected interconnection costs and transmission congestion makes this area of Minnesota ideal for solar. The National Renewable Energy Laboratory (NREL) Direct Normal Solar Resource of Minnesota map is provided below (Figure 2) and demonstrates the strong solar resource in southern Minnesota (NREL, 2021).

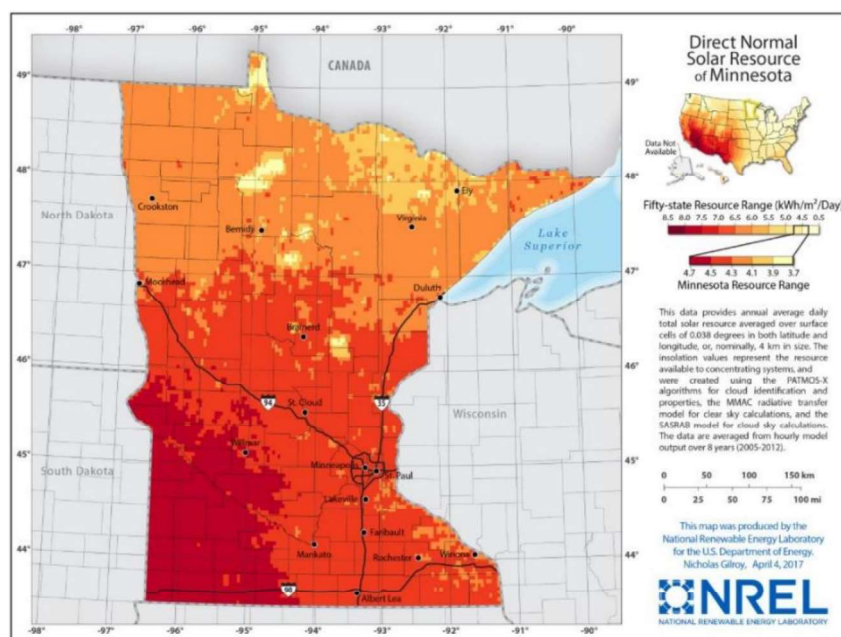


Figure 2: Direct Normal Solar Resource of Minnesota

While southwestern Minnesota has slightly higher solar resource than the southeastern portions of the state, the expected interconnection costs, and transmission congestion in the western part of the state was expected to be much higher (and proved to be for other projects in the MISO queue). EDFR selected the Solar Facility location to optimize solar resource and for low interconnection costs. The Project is currently designed to connect to the Byron Substation with an approximately 3-mile Transmission Line. Adding additional high voltage overhead transmission would significantly increase costs. A high voltage transmission line of more than 5 miles would strain the financial viability of a project of this size. Siting the Project in close proximity to an existing substation allows the Applicant to make efficient use of existing equipment, minimize line loss (due to relatively close proximity to the POI) and avoid the need for large transmission construction and expense. Additionally, recent public meetings at the MPUC in regards to other proposed solar projects have indicated that access to the grid is limited for large solar projects due to interconnection constraints and transmission, and that grid access should be a consideration in the feasible and prudent decision-making process. The future outcome is likely to co-locate solar projects, and other forms of generation, as closely as possible to the substations for efficiency. There is a benefit to the public interest and rate payers, consistent with state policy regarding renewable energy, to have renewable energy sited in close proximity to the POI.

Prior to selecting the area of interest for the Project, the Applicant evaluated potential environmental constraints. A critical issues analysis was performed for the footprint and surrounding area. At that time, it was determined that no prudent alternative locations within a geographically reasonable distance existed and, the best location to site the Project was within 5 miles of the POI.

Lastly, the Applicant met with landowners within proximity to the Byron Substation to gauge interest in Project participation. The Applicant ultimately signed leases and/or purchase options with landowners that own relatively flat, unobstructed, generally contiguous parcels of land, with limited environmental constraints within close proximity of the Byron Substation. All landowners are willingly participating through voluntary agreements with Byron Solar for the Project. As shown in Appendix F, there are 177 parcels owned by 132 unique landowners (137 parcels are nonparticipating/adjacent landowners, with 113 unique landowners (some landowners own multiple parcels); 40 parcels are participating/inside the project, with 19 unique landowners).

3.1.2 Factors to Consider When Prime Farmland is Present

As shown in Table 6, approximately 94.4 percent of soils in Dodge County are classified as important farmland as defined under 7 CFR § 657.5². Of this, 54.2 percent are classified as prime farmland, 35.9 percent as prime farmland if drained, 4.2 percent as farmland of statewide importance, and less than 1 percent is prime farmland if protected from flooding. The remaining 5.6 percent of soils not classified as important farmland are generally associated with vegetated drainages and wetlands generally not suitable for siting solar.

In Olmsted County, about 80.1 percent of soils are classified as important farmland. Of this, 53.3 percent of the soils are classified as prime farmland, 7.6 percent as prime farmland if drained,

² 7 CFR § 657.5 identifies important farmlands to include prime farmlands, unique farmland, farmland of statewide importance, and farmland of local importance.

18.7 percent as farmland of statewide importance, and less than 1 percent is prime farmland if protected from flooding.

Percentages of prime farmlands vary based on the area being calculated. Table 6 includes prime farmland within each county, and Tables 28 and 29 include prime farmland within the Solar Facility and HVTL ROW.

Table 6: Acres of Prime Farmland in Dodge and Olmsted Counties

Prime Farmland Class	Dodge (acres)	Dodge (percent)	Olmsted (acres)	Olmsted (percent)
All areas are prime farmland	152,517.3	54.2	223,565.8	53.3
Farmland of statewide importance	11,911.3	4.2	78,179.0	18.7
Prime farmland if drained	101,164.9	35.9	31,814.0	7.6
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	<0.1	0.0	2,291.1	0.5
Prime farmland if protected from flooding or not frequently flooded during the growing season	117.1	<0.1	<0.1	0.0
Not prime farmland	15,717.1	5.6	82,220.9	19.9
Total	281,427.7	100%	419,070.7	100%

The Applicant completed a Geographic Information System (GIS) evaluation of regional prime farmland and farmland of statewide importance to a distance of approximately 10 miles surrounding the Byron Substation to address Minn. R. 7850.4400, subp. 4 prime farmland limitations (Map 7). The selected distance was determined based on transmission line costs and losses, and a reasonable geographic scope for the alternatives analysis. Moving further away from the POI would not result in less impact to prime farmland. In the case of this Project, where the POI is reasonably close to the proposed solar facility, increasing the distance would ultimately result in longer transmission, an enlargement of the Project's overall footprint, a corresponding increase in prime farmland impact, and increase in Project cost. Consequently, the proposed Project is consistent with Minn. Stat. § 216E.02 which "declares it to be the policy of the state to locate large electric power facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. In accordance with this policy, the Commission shall choose locations that minimize adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion."

Prime farmland, and its sub-categories, are mapped throughout Dodge County except along larger waterway drainages and wetlands. Accordingly, there is no reasonably sized area in Dodge County, or within 10 miles of the Byron Substation that could facilitate solar development of approximately 1,552.6 contiguous acres not defined as prime farmland.

Avoidance of other prohibited areas played a significant role in influencing site selection. As shown on Map 1, the Project is situated between the cities of Kasson to the west, and Byron to the east. Care was taken to ensure the Project was sited outside of potential future expansion areas for both of these cities, and on parcels owned by willing landowners. Site selection was limited to parcels that were not already participating in an active lease agreement with the proposed Dodge County Wind Farm project. Other wind projects in close proximity to the Project include the G. McNeilus Wind Farm about 5.6 miles directly west and the Pleasant Valley Wind Farm about 8.1 miles to the southwest.

Additionally, the Applicant avoided known physical and environmental constraints that may prohibit or make solar development more challenging. Identified constraints are listed below and are also shown on Map 6 if they occur within the project vicinity.

- Airports and landing strips (2-mile buffer),
- Active and inactive mining operations,
- Existing gas pipeline and transmission corridors,
- FEMA Floodplains,
- Farmsteads,
- Public roadways,
- Public lands such as state parks, scientific and natural areas, and wildlife management areas,
- MNDNR Sites of Biodiversity Significance (SOBS),
- MNDNR mapped native prairie, and native plant communities (NPCs),
- MNDNR and USFWS rare species records and critical habitats, and
- Jurisdictional wetlands, waters, and MNDNR Public Waters.

The Project has been thoughtfully sited to avoid impacts to important physical infrastructure and identified sensitive resources, and on the closest available land to the POI. The result is a project that makes efficient use of available land and the solar resource while minimizing adverse impacts to the environmental and existing infrastructure. .

The Applicant made good faith consideration of alternative site configurations and technologies in their search prior to landing on the current project location; however, no other sites or configurations were determined feasible and prudent. There are no alternate sites within a reasonable distance that could be reached with overhead transmission, and a project of this size can support no more than 5 miles of overhead transmission and remain financially viable. The Applicant has designed the project in a way that takes advantage of level topography which will reduce overall grading. Access roads and widths have been minimized to the degree practicable, and existing access points will be used where feasible. The arrays have been cited as closely together as possible while avoiding existing constraints and maximizing energy generation. Additionally, the Applicant has minimized the space between module rows to that which is required to effectively maintain the Solar Facility and allow safe passage between rows by maintenance crews. These combined efforts reduce the overall project footprint and minimizes disturbance to prime farmland soils.

Alternative technologies, such as panel/rack designs that allow siting on steeper slopes were reviewed but were not found to be feasible and prudent. There are no alternate sites within a reasonable distance that could be developed using an alternative design such as fixed tilt, which can accommodate steeper slopes. Reasonable distance for the Solar Facility was defined as being within 5 miles of the POI, beyond which the costs of transmission become unworkable.

Therefore, there is no feasible and prudent alternative available near the Byron Substation or otherwise in Dodge County to construct the Solar Facility and not impact prime farmland. A finding that there is no feasible and prudent alternative to avoidance of prime farmland for the Solar Facility is consistent with past Commission decisions for large solar generating systems sited in prime farmland due to the fact that areas surrounding the proposed Project Substation also contain similar amounts of prime farmland as the proposed site. The amount of prime farmland taken temporarily out of crop production as a result of the Solar Facility represents approximately 0.7 percent of agricultural lands in Dodge County.

Additionally, the Applicant took the process one step further to evaluate available points of interconnect across the state in relation to prime farmland interaction. Using a complex GIS analysis, EDFR determined that opportunities for solar development within 10 miles of a 345kV substation are extremely limited. There are almost no alternatives to the Byron Solar Project outside of perhaps Sherburne, Blue Earth, and Chisago Counties. There are essentially no viable sites south of a line between Fergus Falls and the Twin Cities when prime farmland is excluded. Most potentially buildable locations north of that line would require clearing forests, would have lower solar irradiance, and have a longer distance from load centers. A complete summary of the analysis is provided in Appendix M.

3.1.3 Mitigation and Offsetting Benefits

While the Project as described above has been sited and designed to minimize impacts to prime farmland, the Applicant prepared an Agricultural Impact Mitigation Plan (AIMP) and a Vegetation Management Plan (VMP) to further mitigate Project impacts such as soil compaction, topsoil mixing, soil erosion, invasive and noxious weed species, and rutting. These plans are described in greater detail below.

3.1.3.1 Agricultural Impact Mitigation Plan

In consideration of temporary impacts to agricultural acres, the Applicant has developed an AIMP (Appendix D) detailing methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation cover that will help to ensure the Project is designed, constructed, operated, and ultimately decommissioned and restored in a manner allowing the land to be returned to its original, and possibly improved quality of, agricultural use in the future. It should be noted that the Solar Facility would only temporarily displace the current agricultural activities on prime farmland, that improvements can be removed at the conclusion of Project's useful life cycle, and restored to a condition better to or, at a minimum, similar to its present condition with little or no long-term impact post-decommissioning. Moreover, conversion of the Solar Facility to non-row crop uses during the life of the facility will have beneficial environmental effects such as soil building while soils "rest", erosion control, habitat for wildlife and pollinators, and protection of groundwater and surface water through reduction of the application of harmful agricultural pollutants such as nitrogen and other herbicides and pesticides commonly used in current crop management practices.

3.1.3.2 Vegetation Management Plan

The Applicant has prepared a VMP for the Project (Appendix E). The purpose of the plan is to outline how disturbed soils, and those formally tilled within the Project Area, will be planted, stabilized, and managed following project construction activities. The plan describes the overall strategy for establishing and maintaining vegetation using potential adaptive management approaches such as mowing and herbicide treatments and grazing. The plan takes into

consideration methodologies and approaches for installing appropriate seed mixes, monitoring and management of invasive and noxious weed species, and erosion control. Establishing perennial vegetation within the Solar Facility will provide multiple benefits over the course of the facility's life, including reductions to agricultural fertilizer and pesticide applications, improvements to groundwater and surface water quality, soil stabilization, and "resting" of the soils. Allowing the soils to rest for a period of 35 years will allow microbes and soil fauna to recover, ultimately generating improved soil conditions for future agricultural activities.

3.2 Alternative Solar Facility Sites Considered but Rejected

Pursuant to Minn. Stat. § 216E.04, subd. 2(4) and 2(8), and as specified in Minn. R. 7850.2800 to 7850.3900, HVTL projects greater than 200 kV and less than 5 miles in length and large electric power generating plants that are powered by solar energy qualify for the alternative review process, which eliminates the obligation for an applicant to propose alternative sites and routes within the application. Accordingly, other than the prime farmland alternatives analysis discussed in Sections 3.1.2 and 6.6.4.2, no alternative Solar Facility sites were considered by the Applicant for the proposed Project.

3.3 Future Expansion

The Applicant's interconnection request is for 200 MW, and there are currently no plans for future expansion of the Solar Facility.

4.0 HVTL Route Selection Process

As mentioned in section 3.2, alternative HVTL routes are not required to be identified under the alternative review process. This section describes the Applicant's development of the Proposed Route. Alternate route segments that were considered and rejected are described in Section 4.4.

4.1 Route Width

The Power Plant Siting Act (PPSA) 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 PPSA 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).

The Applicant proposes a route width of 150 feet (75 feet on each side of the proposed Transmission Line route centerline) for the entire route (Map 4).

4.2 Route Selection Process

This section describes the Applicant's development of the Proposed Route. In developing the proposed routes, the Applicant was guided by the routing criteria set forth in the Minn. Stat. § 216E, Minn. R. 7850.4100, and input from local stakeholders and government agencies. These criteria were analyzed to select routes that minimize overall impacts. The criteria include but are not limited to:

- Sharing existing rights-of-way such as transmission lines and railroads.
- Using property lines and agricultural field boundaries to minimize impacts if existing rights-of-way were not available or practicable.
- Maximizing distance between the transmission line and homes.
- Minimizing potential impacts to the natural environment, including wetlands, waterways, trees, and rare and unique natural resources.

As described further in Section 4.4, several alternative routes were considered but are not feasible due to existing lease agreements held by Dodge County Wind, LLC (Map 6). These lease agreements encumber land directly south and east of the Solar Facility. Given the land encumbrances, the Applicant identified an area north of the Solar Facility for routing the HVTL. This area takes advantage of parcels that are available north of U.S. Highway 14 and west of the Byron Substation, and landowners willing to sign easement agreements to route the HVTL through this area.

4.3 Proposed Route Description

The Project also includes construction of approximately 3 miles of new 345 kV Transmission Line that will connect the proposed Solar Facility to the existing Byron Substation. The Proposed Route is displayed on Figure 1 and Maps 3 and 4.

The new 345 kV single circuit line will originate from the proposed Project Substation located just south of U.S. Highway 14 near 640th St/265th Ave in Dodge County. From the Project Substation, the Proposed Route travels north through agricultural fields then continues generally north and east until it turns south into the Byron Substation. Along the route, the HVTL crosses the east and west bound lanes of U.S. Highway 14; three existing electrical distribution lines; three existing transmission lines; three county roads; drainage ditches; and one railroad track.

The Proposed Route is designed to avoid or minimize impacts on residences, the environment, and other sensitive resources. The Proposed Route parallels existing transmission and railroad rights-of-way for about 1 mile and follows field lines for remaining portions of the route. The Proposed Route takes into consideration comments and requests from individual landowners.

The Applicant anticipates using a 150-foot right-of-way for the entire length of the HVTL. Transmission Line structures would be placed roughly in the center of the right-of-way, with 75 feet of right-of-way on each side of the centerline. The total Proposed Route right-of-way is 52.7 acres.

The Applicant respectfully requests the Commission approve the Proposed Route and authorize a route width of 75 feet on each side of the proposed Transmission Line route centerline (150 feet total width) for the length of the route. The Applicant has been working to acquire voluntary easements for the Proposed Route and has secured 100 percent of the total necessary private easements.

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.

4.4 Alternative HVTL Routes Considered but Rejected

Minn. Stat. § 216E.04, subd. 3 and Minn. R. 7850.3100 require an applicant to identify any alternative routes that were considered and rejected for the Project. These alternative routes are described below, along with the reasons they were rejected, and shown on Map 5.

Prior to the establishment and identification of a Proposed Route, the Applicant reviewed the proposed routes identified in the Dodge County Wind Farm Route Permit Application (IP6981/TL-17-308). Two of the proposed routes (Route A and Route B) would connect with the existing Byron Substation and included segments that would cross the Solar Facility.

Dodge County Wind's Route A travels south from the Byron Substation and is generally co-located with an existing 345 kV transmission line for about 3 miles before it turns west just after County Road 25 and crosses the Solar Facility. Dodge County Wind's Route B overlaps with Route A south of the Byron Substation and diverges from Route A just south of U.S. Highway 14 and travels west and south along County Road 15 before it turns west at 650th Street and crosses the Solar Facility. Based on landowner input, Route B would impact at least two residences, therefore the West 270th Alternative Alignment was proposed to avoid the residences. Dodge County Wind, LLC obtained landowner agreements for most of the parcels crossed by Routes A and B, and along the existing 345 kV transmission line.

Dodge County Wind's Routes A and B were not considered feasible at the time Byron Solar was developing route alternatives. Both routes were encumbered by Dodge County Wind leased parcels for nearly the entire length of each route. Given these encumbrances, Byron Solar did not consider these routes feasible.

4.4.1 Rejected Route Segment 1

The Applicant evaluated a route segment that would travel from the Solar Facility near 265th Avenue, east along 650th Street to just past 280th Avenue and run parallel to the existing 345kV transmission line that connects to the Byron Substation (Map 5). This route segment was not feasible due to existing lease agreements along the existing transmission line held by Dodge County Wind, LLC.

4.4.2 Rejected Route Segment 2

The Applicant evaluated a second route segment that crossed U.S. Highway 14 about 0.25 mile east of the currently proposed crossing (Map 5). This route segment was based on the initial Project Substation location. This route segment traveled north across U.S. Highway 14 and followed the edge of an agricultural field between residential yards and a horse pasture. The Applicant signed a lease agreement with a landowner closer to U.S. Highway 14, which allowed the Applicant to move the initially proposed Project Substation to its current proposed location near 640th St/265th Ave, thereby eliminating this route segment and reducing the potential impact to nearby residences.

4.4.3 Rejected Route Segment 3

The Applicant evaluated a third route segment that traveled north and south from the proposed Project Substation (Map 5). The northern segment traveled along the Proposed Route until County Road 34 where it turned east for about 0.3 mile, then turned north and followed the edge of an agricultural field between a commercial building to the railroad tracks. The southern

segment traveled south from the proposed Project Substation through agricultural fields and generally followed the W 270th Alternative Alignment as identified in the Dodge Wind Farm Route Permit Application. This route segment was not feasible due to existing lease agreements held by Dodge County Wind, LLC. Additionally, the Applicant signed a lease agreement with a landowner closer to U.S. Highway 14, which allowed the Applicant to move the initially proposed Project Substation to its current proposed location near 640th St/265th Ave, thereby eliminating this route segment.

4.5 Future Expansion

The proposed 345 kV Transmission Line is primarily designed to meet project needs by reducing line losses and interconnecting at the voltage of the POI. The Applicant does not anticipate the need to connect the Project Substation at a higher voltage than 345 kV within the foreseeable future and is, therefore, not proposing to build the line to accommodate greater voltage or transfer capacity than proposed.

5.0 Engineering and Operational Design

Solar energy generation begins with the installed solar panels converting energy from sunlight into DC electrical power. Blocks of panels are electrically connected in series and terminate at an inverter. Inverters convert the DC power from the panels to power. The power is then stepped-up at a transformer from 34.5 kV to 345 kV, transmitting generated power to the existing transmission infrastructure at the Byron Substation.

5.1 Design

The Project's primary components include PV panels mounted on a linear axis tracking system (Figure 3), centralized inverters, a Project Substation, and a 345kV HVTL. For descriptive purposes, an individual tracker row is used as a basic unit of the Solar Facility. A tracker row is made up of panels mounted on a flat beam oriented north-south, with a break in the middle where the gear box is located. The tracker rows, which tilt east-west to follow the sun throughout the day, are connected together in groups and, depending on the manufacturer, served by a single motor. The racking system consists of all the components involved in fastening the panels to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations.

Associated facilities include electrical cables, conduit, switchgears, step-up transformers, SCADA systems, and metering equipment. The Project will include an O&M Facility, a temporary laydown yard, and internal Project access roads. The Solar Facility will include a perimeter fence that will be gated at access points and will include security locks. Disturbed areas will be re-vegetated with low-growing seed mixes (e.g., short grasses or low-growing forbs, low-growing wetland seed mixes (where appropriate) or some other low-growing perennial cover) and described in the AIMP and the VMP (see Appendices D and E). In some areas, trees and shrubs may be planted to provide screening between the Project and nearby residences (see Appendix L).



Figure 3 : Typical Solar Tracker Row Design

5.1.1 Photovoltaic Arrays and Solar Field

The solar array will consist of PV solar panels, a racking system, inverter skids, security fencing (Maps 3 and 4), and several weather stations.

The Applicant proposes to use panels affixed to tracking mechanisms that would allow the panels to “track” the sun from east to west on a daily basis. The panels and tracking rack system are generally aligned in rows north and south with the PV panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The panels are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day. The tracking rack system allows the Project to optimize the angle of the panels in relation to the sun throughout the day, thereby maximizing production of electricity and the capacity value of the Project.

When the sun is directly overhead, the PV panels will be at a zero degree angle (level to the ground) and four to six feet off the ground. The tracker rows will follow the sun from approximately 60 degrees east to 60 degrees west through the course of the day. At 60 degrees (tilted to the highest position), the edge of the panels will be a maximum of 15 feet off the ground and a minimum of 2-3 feet, pending final design. The design will involve no spinning machinery, no thermal cycle, and no water use (except for infrequent module washing; refer to the Operations and Maintenance discussion in Section 5.1.6). Approximately 594,048 PV panels will be required to make up the 200 MW Solar Facility.

To the extent practical, the racking system foundations will be a driven pier and will not require concrete, although some concrete foundations may be required depending upon site specific soil conditions and geotechnical analysis.

The Applicant is considering using 510 watt – JA Solar panels. This half-cell module is a mono-crystalline model. This model is being considered based on the costs and performance of other

panel options, as well as environmental and safety standards. The final selection will be made closer to the start of construction.

While equipment selection has not been finalized, the Applicant has designed the system using 7,680 ground-mounted linear single-axis trackers. Several racking and trackers are under consideration, including: the ATI DuraTrack, GameChange Solar's Genius Tracker, NEXTracker's NX Horizon, PV Hardware's Axone/Monoline, and Soltect's SF7/SF7 Bifacial model (Figure 4). Racking infrastructure and trackers will be selected closer to the procurement stage to ensure performance standards are met.

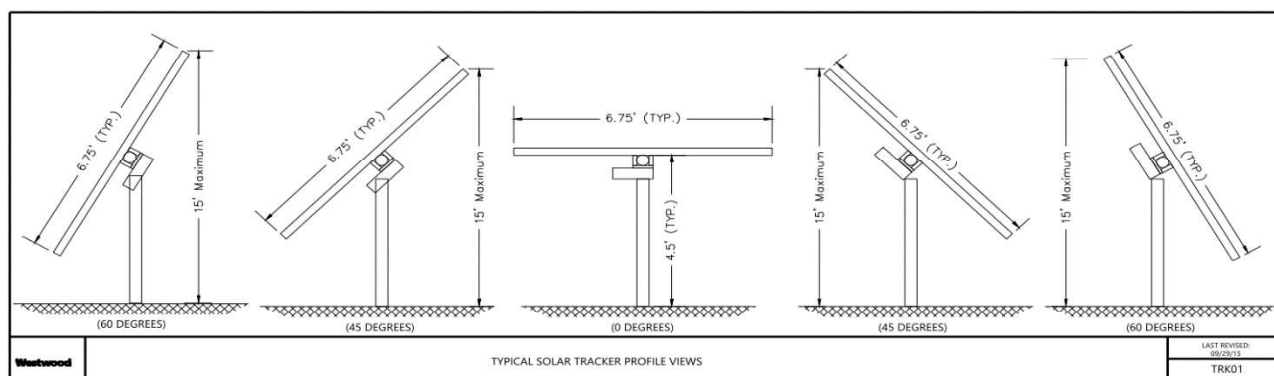


Figure 4: Typical Solar Tracker Profile

New solar panels, typically with higher efficiency or higher wattage per module, are being introduced to the market regularly. As such, the Applicant believes it is important to maintain as much flexibility in the individual supplier and technology choice as possible until just before procurement. Selection of newer, higher wattage equipment that may become available before the Project goes to construction could potentially reduce the overall footprint of the Project.

5.1.2 Electrical Collection System

The solar panels deliver DC power to the inverters through cabling that will be buried in an underground trench or ploughed in place (at least four feet deep and two to four feet wide (Figure 5). The depth to cables may be deeper for installation under existing utilities or other features requiring avoidance. The specific electrical collection technology used will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system. Underground cabling will be installed in accordance with the AIMP.

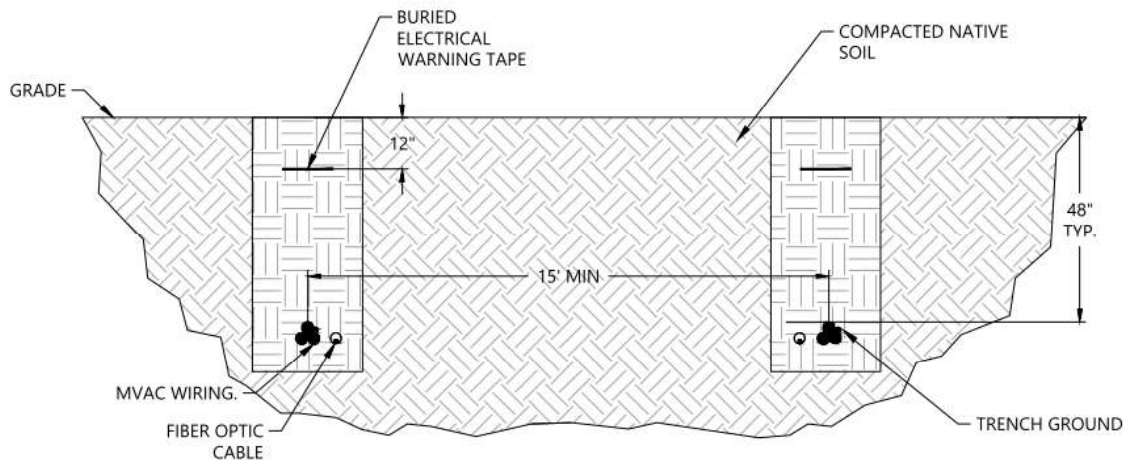


Figure 5: Typical Solar Collection Trenches for Cables

5.1.3 Project Substation

The Project Substation is proposed for an area about 2 miles southwest of the existing Byron Substation, which is just west of Byron (Maps 2 and 3). The Project Substation will be located outside the fenced solar arrays and is estimated to occupy 6.8 acres of agricultural land. It will include a 34.5/345 kV step-up substation with metering and switching gear required to connect the Project to the transmission grid. It will be designed in accordance with regional utility practices and codes.

The Project Substation will be accessible for operations and approved parties at all times using the Solar Facility's access roads. It 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. The Project Substation location will be graded and overlain with crushed rock; secondary containment areas for the transformer will be installed as necessary. The fenced area of the Project Substation footprint will be approximately 160 feet x 175 feet in size (subject to final substation layout). Underground 34.5 kV collector lines from the Solar Facility will deliver solar generated energy to the Project Substation. The collector system voltage will then be stepped up from 34.5 kV to 345 kV and transmitted to the Byron Substation via the 3-mile Transmission Line.

The Project Substation will be graveled to minimize vegetation growth in the area and reduce fire risk. The substation will be fenced with either a 6-foot chain-link fence with top guard angled out and upward at 45 degrees with 3-4 strands of smooth wire (no barbs), or an 8-foot chain link fence for security and safety purposes. Posts for fencing around the Project Substation will be spaced approximately 10 feet on center. Corner posts will be augured 3.5 feet and embedded in concrete for structural support. Tangent posts will be direct buried 3.5 feet similar to corner posts.

5.1.4 Transmission System

5.1.4.1 Transmission Structure Design

The Applicant proposes the construction of a single circuit 345 kV (AC) Transmission Line using weathering steel monopoles (poles or structures) that generally range in height from 90 feet to

170 feet tall. Approximately 24 structures will be installed to facilitate the connection between the Project Substation and the Byron Substation. Of these 24 structures, two shorter structures will be used within the Project Substation and Byron Substation to tie-in to the larger structures. Figure 6 shows the three types of structures that will be used between the Project Substation and the Byron Substation. These structures include:

- Tangent: for in-line (straight) segments.
- Small Angle: used in locations where the alignment slightly shifts direction.
- Deadend: used within the Project Substation, at 90 degree turns, and as the HVTL approaches and enters the Byron Substation.

Structures will be spaced approximately 232 to 974 feet apart. Foundations for the structures will be directed embedments and drilled piers. The tangent structures or non-containment structures will be backfilled with concrete slurry and all other structures will utilize drilled piers. Drilled pier foundations may vary from approximately 3 to 6 feet in diameter and 20 to 30 feet or more in depth, depending on soil conditions. The maximum operating temperature for the Transmission Line is 212°F (100°C).

The line insulators will be polymer and designed to operate at 345 kV phase-to-phase. The insulated section length will also meet APLIC recommendations for avian protection (APLIC, 2006). See section 6.6.7.1 for further details on avian protection measures.

The proposed 345 kV Transmission Line will be designed to meet or surpass all relevant local and state codes, and other recognized standards such as the RUS Bulletin 1724E-200, Design Manual for High Voltage Transmission Lines, National Electrical Safety Code C2-2017, ASCE, ACI and the AISC Steel Construction Manual, North American Electric Reliability Corporation standards, and the NESC. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.

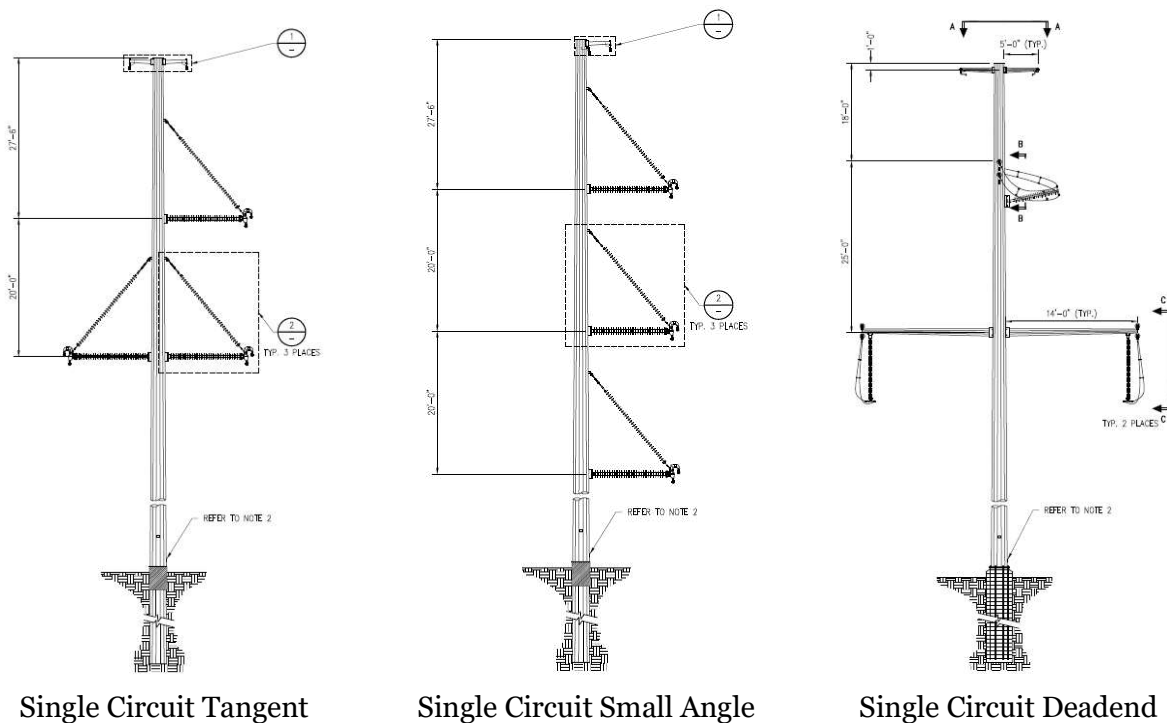


Figure 6: Typical Overhead Transmission Line Structures

5.1.4.2 Transmission Line Right-of-Way

The Applicant anticipates constructing the new single-circuit 345 kV transmission line with a 150-foot right-of-way, 75 feet on either side of the centerline, for the entire 3-mile route. The right-of-way will share existing transmission and railroad rights-of-way for about 1 mile and will reduce the overall size of the easement required from the private landowners. Three existing distribution lines, three existing transmission lines, four road crossings, and one railroad crossing exist along the route. The remaining portions of the route follow field lines. Pole placement and offset distances may vary in areas such as highway interchanges due to county or state design requirements and in areas of planned future road expansion. Right-of-way clearances will comply with NESC 2017 at maximum line operating condition. Conductor and all structure components will remain within the Project's right-of-way. The conductor is a two-bundled 795 kcmil 26/7 ACSR "Drake" with a single 48 fiber OPGW (DNO-10926) and an additional 3/8" EHS 7-strand steel OHGW for additional shielding.

The Applicant will construct, own, and operate the 345 kV Transmission Line between the Byron Substation and the Project Substation. The Project Substation includes a 345 kV circuit breaker, 34.5 kV/345 kV generator step-up transformer, relay and protective equipment, SCADA equipment, telecommunication equipment, and metering equipment. There will be a single collector pole structure within the Project Substation and at least one deadend pole structure used to enter the Byron Substation. The exact length and position of the line and poles will be determined by on-going engineering. The final placement and design of the Transmission Line will incorporate feedback from the owners of several transmission lines that currently enter the Byron Substation from the north and south that the Transmission Line may need to cross before entering the Byron Substation. An approximate location for the Transmission Line is provided in the Plan and Profile in Appendix G.

5.1.5 Associated Facilities

The Solar Facility infrastructure will include a Project Substation, racking systems, an O&M Facility, underground electrical collection system, approximately 64 inverters, a security fence/gate, a temporary laydown yard, several weather stations, and gravel access roads.

Each inverter pad will also include one transformer to which the inverters will feed electricity (Figure 7). Inverters convert the DC output of the panels to AC, which is required for delivery to the electrical grid. After the inverter has converted the electricity, the electricity is stepped-up via a transformer from low voltage to medium or intermediate voltage (up to 34.5 kV). The final number of inverters for the Solar Facility will depend on the inverter size, inverter and module availability, as well as the final array configuration. The inverters currently considered are SMA Solar Technology 4200 UP-US inverters. The Applicant has considered the costs and performance of several inverters as well as environmental and safety standards when making the decision of selecting this inverter. The Solar Facility's preliminary design assumes below-ground cabling to represent the maximum potential impacts and has proposed 64 central inverters and associated concrete pads. These concreted pads provide the foundation for the inverter, transformer, and the SCADA system. The concrete pads will be poured onsite or precast and assembled off-site.

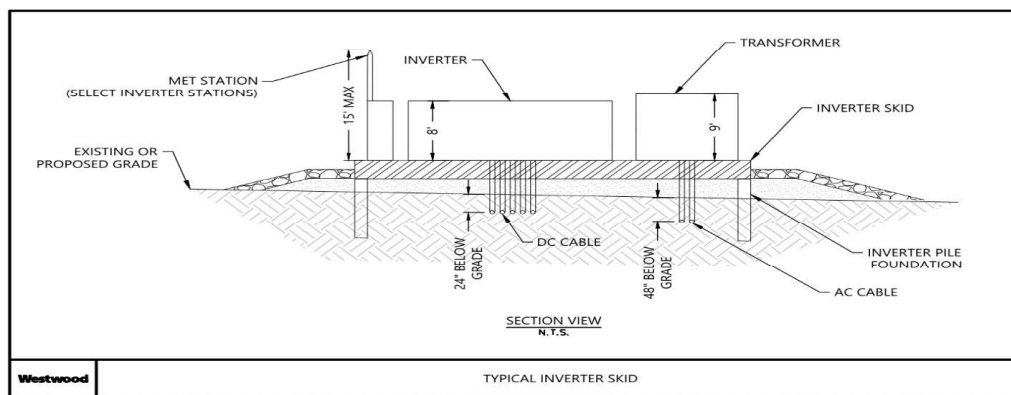


Figure 7: Typical Solar Inverter Skid

The Byron Substation is owned by the Southern Minnesota Municipal Power Agency (SMMPA) and is located about 2 miles northeast of the Project Substation. The Byron Substation serves as a connection for multiple high voltage lines that run east of the Solar Facility and along and across the proposed Transmission Line right-of-way. The Byron Substation will serve as the POI between the Project Substation and the regional transmission system.

5.1.6 Operations and Maintenance Area

The proposed O&M Facility is where solar panels and other equipment will be remotely monitored using a SCADA system, maintenance of equipment can be conducted, equipment can be stored, and employees can park. The location of the O&M Facility is currently planned on approximately 2.6 acres with a 100-foot x 100-foot pad to accommodate a building footprint of approximately 70 feet x 35 feet. The O&M Facility is directly east of the Project Substation location (Map 3).

5.1.7 Transportation/Pipelines/Electrical Transmission

The Project will include approximately 22.7 miles of graveled access roads that lead to the inverters and other infrastructure for operation and maintenance (Maps 3 and 4). The final length of the access roads will depend on the equipment selected and final engineering. These roads are typically 12-16 feet wide along straight portions of the roads and wider along curves and at internal road intersections (approximately 45 feet). See Figure 8 for typical access roads profiles. Access roads may be temporarily wider during construction, and then reduced in width for long term site access upon completion. The northeastern portion of the Solar Facility will be accessed from 270th Avenue, while the northwestern portion will be accessed from 650th Street, the central portion will be accessed from 655th Street and 660th Street, and the southeastern portion will be accessed from 120th Avenue SW. The proposed entrances will have locked gates.

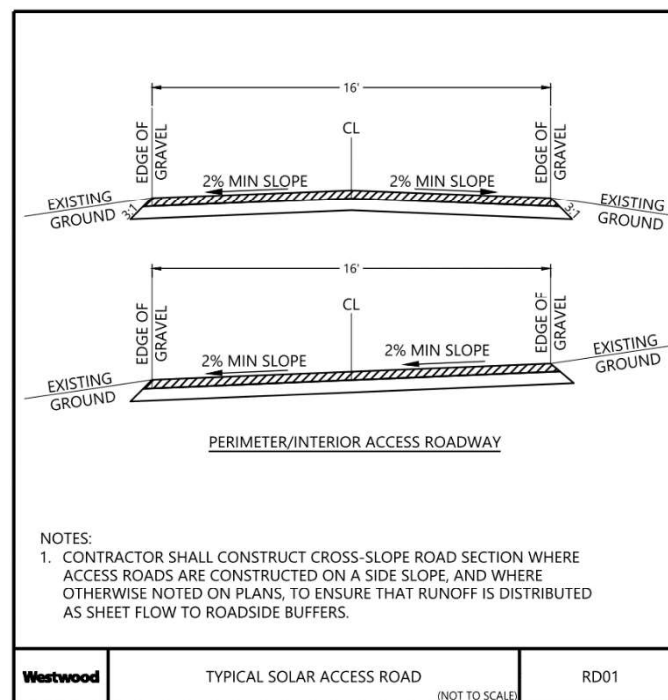


Figure 8: Typical Solar Access Road Profile

Some upgrades or other changes to the public roads may be required for construction or operation of the Project. The Applicant will work with Dodge and Olmsted counties 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.

Road improvements may require a road use and repair agreement with Dodge and Olmsted counties; the Applicant will continue to coordinate with state, county, and township road authorities as the Project develops. Driveway changes using county roadways will require an access permit from the county, which will be obtained prior to construction.

No pipelines will be built, accessed, or needed to construct or operation the Project.

The Applicant will obtain relevant permits from road authorities relating to accessing the Project through public roads, as well as installation of temporary facilities that may be proposed to

occupy portions of public road rights-of-way during the construction process. The Applicant will also obtain relevant permits and/or authorizations from road authorities relating to electric cables and/or feeder lines that may be placed in or across a public road right-of-way.

5.1.8 Temporary Facilities

One temporary laydown yard is proposed to support Project construction. The laydown yard will be fenced and used for equipment, construction materials and supply storage, temporary job trailers, and temporary parking for Project-related vehicles. The laydown yard will be located in the southwest quadrant of 270th Avenue and 655th Street on agricultural land, outside of wetlands and waterways. The laydown yard would temporarily affect about 12.2 acres of agricultural land. See Maps 3 and 4 for the laydown yard location.

The laydown yard will be in place for approximately 12 to 24 months and then restored. General laydown yard preparation and restoration will be completed in accordance with the site-specific Stormwater Pollution Prevention Plan (SWPPP).

Road intersections may need to be temporarily improved to accommodate large equipment and deliveries during construction of the Project. The Applicant will coordinate with local road authorities and landowners prior to any intersection improvements.

5.2 Project Layout

The final layout will optimize electrical generation and efficiency of the Solar Facility while avoiding and minimizing environmental, cultural resources, and infrastructure impacts. The Project's facilities will be sited to comply with the Counties' setback requirements, where feasible, and will also comply with other local, state, and federal regulatory standards. The preliminary Project layout can be found on Maps 3 and 4.

5.2.1 Setbacks

The Dodge County Zoning Ordinance contains Section 16.46 (Solar Energy Farms), regulating solar facilities under its jurisdiction, and Section 16.21 (Essential Service Lines), regulating Major Essential Services. Section 16.46 contains setbacks applicable to project substations and O&M facilities as Accessory Solar Energy Systems, and setbacks are required to meet all applicable performance standards for the use and zoning district in which it is located. Setbacks are provided in Table 7 and are also shown on the Preliminary Civil Site Plan in Appendix G.

The Olmsted County Zoning Ordinance does not list setback requirements for transmission lines (Essential Services), or transmission lines associated with solar energy farms (Olmsted County, 2017).

The Applicant considered the Dodge County setbacks when designing the Solar Facility and the HVTL; however, land constraints such as transmission line easements, wetlands, trees, and others make it difficult for arrays to be sited further away from road rights-of-way, side/rear property lines of lands not included as part of the Solar Facility, and dwellings not owned by an owner/benefactor of Solar Facility. The Applicant is committed to working with Dodge and Olmsted counties to meet setback requirements where feasible.

Table 7: Dodge County Setback Requirements

Feature	County Setbacks for Solar Facility (feet)	Project Design to Closest Solar Array (feet)	County Setbacks for HVTL¹ (feet)	County Setbacks for Project Substation and O&M Facility (feet)
Dwellings and other sensitive Receptors	200	152 ⁵	100 ²	10
Unoccupied Structures	--	100	50	--
Property Lines	50	50	--	25 / 10 ³
Interstate, State, and County Roads	50	100	--	50
Wetlands	60	50 ⁶	--	--
OHW of a public watercourse	100	n/a	--	100
Watercourses, ditches, and county tile mains	50	n/a	--	--
Well	--	n/a	--	3
Drainfield	--	n/a	--	20
Septic Pump/Tank	--	n/a	--	10
Prohibited in the Floodplain Overlay District ⁴	--	--	--	--
Prohibited in the Urban Expansion Zone ⁴	--	--	--	--
¹ HVTL setbacks only apply to Major Essential Services that are not located in the public right-of-way. All distances are measured from the closest edge of the easement to the closest part of the structure. ² Overhead powerlines must also be 100 feet from a facility requiring assisted evacuation including, but not limited to, congregate living, convalescent services, detention facilities, day care services, hospitals, clinics, schools, group homes, and other similar uses. ³ The property line setback for accessory structures may be reduced to ten (10) feet if the landowner signs and records the Agricultural Covenant identified in Section 8.2 of the Dodge County Ordinance and installs measures (rain gutters, diversions, etc.) to prevent or mitigate the impacts from roof drainage and increased impervious surface onto adjacent agricultural land. ⁴ The Solar Facility is not located in a Floodplain Overlay District or the Urban Expansion Zone. ⁵ The final layout will be adjusted after parcel lines and buildings are surveyed to maintain the minimum setbacks required. The discrepancy for this particular house stems from measuring distances based on aerial photography. ⁶ The final layout will follow the county wetland setback requirements to the extent practicable.				

5.2.2 Solar Facility Development Area

The Solar Facility encompasses 1,801 acres, Approximately 1,552.6 acres would be developed to support Project infrastructure and 248.4 acres of undeveloped land based on the preliminary design configurations. Table 8 summarizes the estimated acreage within the Solar Facility.

Table 8: Estimated Solar Facility Acreage

Solar Facilities	Acres ¹
Development Area	
Solar Arrays (fenced area, includes vegetated spacing between panels)	1,271.2
Access Roads	152.7
Buried Electrical Collection Lines	90.2
Inverters	0.2
Project O&M Facility	2.6
Project Substation	6.8
Stormwater Basins	16.6
Laydown Yard (temporary)	12.2
Total	1,552.6
Undeveloped Area²	248.4
Project Total	1,801.0
¹ The Solar Facility Development Area includes the area within the Solar Facility that is hosting solar equipment and will be surrounded by a fence. The Development Area includes access roads (including those extending beyond the Solar Facility boundary), buried electrical collection lines, inverters, an O&M Facility, Project Substation, stormwater basins, and a temporary laydown yard for a total of 1,552.6 acres. ² The Undeveloped Area includes all areas outside the fenced area but within the Solar Facility. Note: The total shown in this table may not equal the sum of addends due to rounding.	

5.3 Construction, Commissioning, Restoration, Operation and Maintenance

A variety of activities must be completed to carry the Project through construction and into operation. Below is a preliminary list of activities necessary to develop the Project. Activities specific to construction of the HVTL are provided in Section 5.3.2.2. The Project will include pre-construction, construction, and post-construction activities as detailed below include:

- Pre-construction
 - Geotechnical investigation.
 - Underground utility discovery.
 - Design Project Substation.
 - Design solar array, access roads, transmission line, and electric collection system.
 - Procure necessary facility components (solar panels, tracking system, and transformers).

- Construction
 - Site preparation, grubbing grading and excavation.
 - Construct laydown yard and set up temporary job site trailers.
 - Access road construction.
 - Construct and install fencing.
 - Install PV pile foundation posts.
 - Tracker installation.
 - PV module installation.
 - Install below-ground collection system.
 - Install electrical enclosure/inverter.
 - Construct transmission line.
- Post-construction
 - Restore disturbed areas not intended for permanent above-ground facilities (permanent above-ground facilities include the Project Substation and inverters, skids and electrical cabinets, and access roads).
 - Test facilities.
 - Begin commercial operation.

5.3.1 Solar Facility Construction, Commissioning, Restoration, Operation and Maintenance

5.3.1.1 Construction and Construction Management

Construction will begin after the necessary permits are received and the electrical interconnection process is finalized. Solar Facility construction will begin with workforce mobilization and the initial site preparation work including grading, vegetation removal, and any necessary tree removal. Preliminary engineering analysis indicates that approximately 937 acres of the total Solar Facility will require grading. A total of 728,525 cubic yards of cut and fill is estimated for the Solar Facility overall. Mass grading of the site will not be employed and will generally occur to “flatten” various areas of the site to facilitate installation of panels, inverters, access roads and the Project Substation. Construction will likely take place over 2 construction seasons given the project’s size and restrictions for winter construction. The exact schedule will depend on what time of the season construction can begin, but approximately 12-18 months of active construction are anticipated, occurring over a 24-month window.

In this first phase of construction, general site improvements will be made such as access improvements and preparation of the laydown yard. A single temporary laydown area will be approximately 12.2 acres and will be centrally located within the Solar Facility. It will not be fenced. The laydown yard will be used for storage of construction materials and shipped equipment containers, receiving construction deliveries, and temporary parking for Project-related vehicles. Temporary construction office trailers will also be located onsite during construction.

The solar energy system (solar arrays and electrical collection cables) will be installed next along with access roads within the arrays. The Solar Facility will be constructed in blocks, and multiple blocks will be constructed simultaneously.

Construction of the Project Substation will take place simultaneously with the solar arrays. Grading for the substation foundation and future access roads will have already been completed. The grounding grid and underground conduit will be installed in conjunction with the foundations for the transformer, control housing, and high voltage structures. The substation

equipment will then be delivered to the site and installed on the prepared foundations. Secondary containment areas for the transformer will be constructed as necessary and finish grading will occur around the substation. The last construction activities associated with the Project Substation includes stringing the electrical wires, installing the perimeter fence, and placing coarse, clear crushed rock throughout the interior of the fenced area and three feet outside the fence.

Onsite construction personnel will consist of laborers, craftspeople, supervisory personnel, construction management personnel, civil and construction trades, as well as administrative and support staff. The Applicant will issue a Request for Proposal (RFP) to Balance of Plant (BOP) contractors to construct the Project. The Applicant will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The BOP contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget. Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. The Project will create approximately 293 jobs during the construction and installation phases and 4 full time permanent jobs during the operations phase. The Applicant estimates that there will be between 10 and 20 semi-trucks used daily for equipment delivery during construction. This volume of traffic will only occur for several weeks during tracker and module delivery; truck traffic will decrease once these components are delivered. Light duty trucks will also be used on a daily basis for transportation of construction workers to and from the site. Typical construction equipment such as scrapers, bulldozers, dump trucks, watering trucks, motor graders, vibratory compactors, and backhoes will be used during construction. Specialty construction equipment that may be used during construction will include:

- Skid steer loader.
- Pile driver.
- Medium duty crane.
- All-terrain forklift.
- Concrete truck and boom truck.
- High reach bucket truck.
- Truck-mounted auger or drill rig.

Upon completion of construction, heavy equipment will be removed from the Project site.

5.3.1.2 Inspections and Commissioning

Equipment inspections will be conducted prior to commercial operation of the Solar Facility. Inspection and testing will occur for each component of the solar array, as well as the associated communication, meteorological, collection, transmission, and SCADA systems. Testing, inspections, and commissioning will occur at periods during construction and upon completion of the construction phase. The estimated timeframe between final construction and COD is approximately 30-60 days.

5.3.1.3 Site Restoration

As portions of the Solar Facility near completion, the laydown yard and other temporary disturbance areas will be restored. The Solar Facility will be graded to natural contours where possible and soil will be de-compacted. Disturbed areas will be reseeded and re-vegetated with

specific seed mixes in accordance with the Project's VMP (Appendix E) and the SWPPP. These seed mixes are designed to be used with the vegetation management practices of mowing, grazing, and selective herbicide application. All areas that will not contain permanent facilities (area under the arrays and the laydown yard) will be stabilized with erosion control measures such as silt fence, hydro-mulch and sediment control logs until vegetation has established. Additionally, a cover crop will be planted with the native mixes to stabilize the soil and prevent erosion during the time it takes for the native seeds to establish. The Applicant anticipates that the post-construction clean-up and site restoration activities will take approximately four to six months.

The VMP provides a guide to site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion and sedimentation. The required restoration management is designed to continue for 3 years. The VMP outlines vegetation management tasks during the establishment and perpetual maintenance phases including monitoring for and treating invasive species, mowing, and re-seeding.

The Solar Facility will use an adaptive management approach for vegetation management as outlined in the VMP. Monitoring vegetation during the active growing season (May-October) is a key aspect of adaptive management. Consequently, site evaluations are planned for the first 3 years of vegetation establishment. Monitoring will be useful in identifying issues, tracking progress, and reevaluating management needs.

The VMP outlines several vegetation maintenance strategies that may be implemented at the Project including mowing, herbicide use, and grazing. Mowing will be used to help control weed species until natives become established. Herbicides will be employed where it is determined that mowing alone will not accomplish perennial weed control. Alternatively, grazing may be used experimentally to determine it proves to be a more viable long-term management strategy.

5.3.1.4 Operation and Maintenance

Following commissioning and commercial operation, the care, custody, and control of the Solar Facility transfers from the construction team to the operations staff. The construction manager works with the operations staff, the equipment suppliers, and other construction and maintenance personnel to ensure a smooth transition from the start of construction to the commercial operation date of the Solar Facility. The operations staff will have full responsibility for the facility to ensure operations and maintenance are conducted in compliance with approved permits, prudent industry practices and the equipment manufacturer's recommendations.

The Solar Facility will be professionally maintained and operated by the Applicant, EDFR, an affiliate, or contractor. Primary tasks include scheduled monthly and quarterly inspection(s) of electrical equipment, vegetation management as well as snow removal on access drives.

The expected service life of the Project is 35 years or longer based on the useful commercial lifespan of panels, and the Applicant estimates that the Project will result in up to 4 full-time permanent positions to operate and maintain the Project facilities. The positions would be based in Minnesota, and individuals hired may share responsibilities other solar sites that EDF is developing. Up to four FTE's would be needed at Byron, and additional FTEs would be added if staff share responsibilities at other project sites. A maintenance plan will be created for the Solar Facility to ensure the performance of the solar facilities, including a scheduled check of the main items and a predictive maintenance approach of the devices subjected to derating/degradation.

Derating/degradation refers to the known process of components losing some efficiency or otherwise degrading over the course of the Solar Facility's life cycle; like all technology and physical components, a certain amount of this is unavoidable, and the Applicant will plan for it and maintain the facility as needed. Once construction is complete, the solar facility will see one truck on-site weekly, with potentially more personnel on site at intervals associated with scheduled maintenance. The main scheduled activities are described in more detail in Table 9.

All maintenance activities will be performed by qualified personnel and will be performed during the day to the extent that they do not disrupt energy production. Activities that have the potential for substantial noise generation will be performed during the day to minimize impacts in areas where residents are present. It may be desirable to perform certain maintenance functions after sunset to minimize loss of power production. The operation of the Solar Facility is partitioned to a certain extent to minimize the effect of unscheduled maintenance on overall energy production. As an example, if a module needs repair, that particular section of the array can be disconnected from the array by opening the combiner box circuit. The module can then be replaced, and the combiner box circuit closed. Because of the way the facility is designed, a temporary shutdown such as this would result in only a minimal loss of production capability during that time. Additionally, the power production circuits are separated from the tracking circuits. This allows the PV panels to operate during an unscheduled outage of the tracker system.

The Solar Facility will be operated through a real-time control system for most operations functions, discussed further in Section 5.3.1.5.

5.3.1.5 Supervisory Control and Data Acquisition System (SCADA)

Performance monitoring will consist of a real-time and continuous assimilation of the data acquired by several onsite meteorological stations, energy meter and SCADA. The SCADA system provides data on solar generation and production, availability, meteorology, and communications. The solar arrays will communicate directly with the SCADA system for remote performance monitoring, energy reporting and troubleshooting. Operators will be notified immediately of any abnormalities allowing for timely corrective action.

5.3.1.6 Equipment Inspection

Inspection of the main equipment will occur at regular intervals, including:

- PV panels: visual check of the panels, tracking system and surrounding grounds to verify the integrity of the panels and tracking structure, the presence of animals and nests, etc.
- Inverters, transformer, and electrical panels: visual check of the devices including connection equipment and the grounding network. Check for presence of water and dust.
- Electrical check: Check of the main switches and safety devices (fuses).
- Noise: check of abnormal sounds.
- Cabling and wiring: visual check of electrical lines (where visible) and connection box to verify its status.
- Routine visual inspection of the transmission line, structures, and components (maintenance of structures may be performed by other parties).
- Project Substation: scheduled visual inspections.

5.3.1.7 Performance Monitoring

Performance monitoring will consist of a weekly or monthly download of the data acquired by the SCADA system (energy produced, alarms, faults, etc.).

5.3.1.8 Facility Maintenance

Housekeeping will include access road maintenance, vegetation maintenance (method is to be determined based on plant design; either traditional mowing, herbicides, or sheep will be used), fence and gate inspection, lighting system checks, and PV module washing at Applicant's direction (if required; minimal to no washing is anticipated to be needed).

5.3.1.9 Maintenance Frequency

Table 9 provides more information on the anticipated frequency of the operations and maintenance tasks. The table represents the anticipated frequency of these tasks; the frequency of inspection may be varied based on facility demands and experience with performance of certain components and features.

Table 9: Operations and Maintenance Tasks and Frequency

Plant Device	Task	Anticipated Frequency
Photovoltaic (PV) Field	PV Panels visual check	Annually
	Wiring and junction boxes visual check	Annually
	Overview aerial thermal scan	Annually
	Advanced diagnostics	At Owner's Direction
	PV strings measurement of the insulation	Annually
	PV strings and string boxes faults	Annually
	PV panels washing	No regular washing planned (only as site-specific conditions warrant)
	Snow removal from access roads	Annually, as needed
	Vegetation Management (if necessary, at site)	Up to three times a year depending on site conditions, and compatible with plant design.
Electric Boards	Case visual check	Annually
	Fuses check	Annually
	Visual Torque check	Annually
	Surge arresters check	Annually
	DC voltage and current check	Annually
	Grounding check	Annually
Inverter	Case visual inspection	Annually

Table 9: Operations and Maintenance Tasks and Frequency

Plant Device	Task	Anticipated Frequency
	Air intake and filters inspections	Annually
	Conversion stop for lack of voltage	Annually
	AC voltage and current check	Annually
	Conversion efficiency inspection	Annually
	Data logger memory download	Annually
	Fuses check	Annually
	Grounding check	Annually
	Torque check	Annually
Support Structures	Visual check	Annually
	PV panels torque check on random sample	Annually

5.3.2 HVTL Right-of-Way Acquisition, Construction, Restoration, and Maintenance Procedures

The Applicant developed right-of-way acquisition, construction, restoration, and maintenance procedures for the HVTL. Although certain procedures will be site-specific based upon the final route design, general procedures are discussed in some detail in this Application.

5.3.2.1 Right-of-Way Acquisition

New right-of-way is required for the HVTL. The Applicant has secured 100 percent of the total necessary private easements from landowners for the 52.7 acres of right-of-way required for the Proposed Route.

5.3.2.2 Construction Procedures

Construction of the HVTL will not begin until all applicable federal, state, and local approvals are obtained, easement agreements are acquired, soil conditions are determined, and final design has been completed.

Equipment, Surveying, Clearing, and Staging

In addition to the equipment listed in Section 5.3.1.1, construction equipment typically used on transmission line projects also includes tree removal equipment, mowers, cranes, digger-derrick line trucks, track-mounted drill rigs, front end loaders, bucket trucks, flatbed tractor-trailers, flatbed trucks, and various trailers.

Prior to construction, surveyors will stake the transmission line centerline and pole locations. Vegetation (trees, shrubs, forbs) would be cleared to create a temporary access road approximately 20 feet wide, as well as any vegetation required to construct the poles/footings.

Taller vegetation (trees and shrubs) that would interfere with construction would be cleared from the remainder of the construction corridor. Erosion and sediment control devices will be installed as needed.

A temporary laydown yard will be used to store equipment and materials prior to and during construction. The laydown yard will be located within the Solar Facility.

Access Road Construction

Access to the HVTL right-of-way will be made directly from existing roads or farm field access roads that run parallel or perpendicular to the HVTL right-of-way. In some situations, private field roads will be used where necessary to accommodate heavy equipment used in construction, including cranes, concrete trucks, and hole drilling equipment. On landowners' parcels, existing access roads may be upgraded, or new roads may be constructed to Project specifications. New access roads may also be constructed where no current access is available, or the existing access is inadequate. These activities will be coordinated with the owner of the property affected and Olmsted County.

Transmission Construction

Transmission line structures are generally designed for installation at existing grades. No significant grading is anticipated as the existing topography within the right-of-way is relatively flat and ranges from about 1,270 feet above mean sea level (amsl) where the HVTL crosses U.S. Highway 14 to about 1,250 feet amsl near the Byron Substation. Typically, structure sites with 10 percent or less slope will not be graded or leveled. Sites with more than 10 percent slope will have working areas graded level or fill brought in for working pads. It is preferred to leave the leveled areas and working pads in place for use in future maintenance activities, if practical. If not, the site will be graded back to its original condition and original drainage maintained to the extent possible and imported fill is removed.

After the structure pads are stabilized, the structure foundations will be installed. Foundations for the pole structures will be directed embedments and drilled piers. The single circuit tangent structures or non-containment structures will be backfilled with concrete slurry. All other structures will use drilled piers.

As discussed in Section 5.1.4.1, three different pole structures will be used along the HVTL route (Deadend, Small Angle, and Tangent). Deadend poles are located within the Project Substation, at 90 degree turns, and as the HVTL approaches and enters the Byron Substation. Deadend poles will be installed on drilled piers and drilled pier foundations will be designed as reinforced concrete piers. All reinforced piers shall have a minimum projection of one foot of concrete above ground, and the minimum reveal used for design will be 1.5 feet to account for the anchor bolt projection. Drilled pier foundations may vary from approximately 3 to 6 feet in diameter and 20 to 30 feet or more in depth, depending on soil conditions. Steel reinforcing bars and anchor bolts are installed in the drilled holes prior to concrete placement. After the concrete foundation is set, the pole is bolted to the foundation.

Tangent and angle structures will be direct embedded and backfilled with an approved concrete slurry. All embedments will have appropriate properties to support end bearing and will be designed considering lateral and axial-compression loading. Concrete slurry and reinforced concrete design will be performed in accordance with the national building code requirements for structural concrete. Direct embedding involves digging a hole for each pole, filling it partially with crushed rock, and then setting the pole on top of the rock base. The area around the pole is

then backfilled with crushed rock and/or soil once the pole is set. Any excess soil from the excavation will be spread and leveled near the structure or removed from the site, if requested by the property owner or regulatory agency.

Conductor stringing is the process of attaching conductor wires to the insulators suspended from the poles. It generally involves pulling the conductor wire off a truck-mounted spool (Molburg, J.C., et al., 2007). Conductor stringing operations require brief access to each structure to secure the conductor wire and shield wire once the final sag is established. Temporary guard or clearance structures are installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways, waterways, or other obstructions after any necessary notifications are made or permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors are protected from damage.

Environmentally sensitive areas such wetlands and waterways areas may require special construction techniques. Based on the field delineation, 5 wetlands and ditches/waterways were identified within the HVTL right-of-way (see Table 29). The Applicant will minimize impacts to these features by not placing pole structures within wetlands and spanning waterways. In addition, construction equipment will not be driven across wetlands or waterways unless there are no other reasonable alternatives for construction and only after discussion with the appropriate resource agency and any necessary permits are obtained.

5.3.2.3 Restoration and Clean-up Procedures

The ground will be disturbed during the normal course of work (as is typical of most construction projects), which can take several weeks in any one location. The Applicant will take the steps necessary to lessen the impact of the HVTL on the surrounding environment by restoring areas disturbed by construction in accordance with best management practices (BMPs) and any permit conditions. This will begin with a pre-construction survey that will identify areas requiring special restoration procedures. During construction, crews will also attempt to limit ground disturbance wherever possible. As construction on each parcel of land is completed, disturbed areas will be restored to its original condition to the maximum extent practicable.

The Applicant or its contractor will contact each property owner after construction is completed to identify and address any damage that may have occurred as a result of the HVTL construction. If damage has occurred to crops, fences, drainage tiles, or the property, the Applicant will fairly compensate the landowner for the damages sustained in accordance with the terms and conditions agreed upon in the easement agreements entered into by the landowner and the Applicant.

In some cases, the Applicant may engage an outside contractor to restore the damaged property to its original condition to the extent practicable. Portions of permanent vegetation that are disturbed or removed during construction of the HVTL will be reestablished to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish naturally with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the approved route will require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used BMPs to control soil erosion and assist in reestablishing vegetation that may be used on the Project include, but are not limited to:

- Erosion control blankets with embedded seeds
- Silt fences
- Hay bales
- Hydro seeding
- Planting individual seeds or seedlings of non-invasive native species

This is further discussed in the Agricultural Impact Mitigation and Vegetation Management Plans (Appendices D and E).

5.3.2.4 Maintenance Procedures

Transmission lines are designed to operate for decades. Typically, they require only moderate maintenance, particularly in the first few years of operation. The estimated service life of the proposed Project is approximately 35 years.

Transmission infrastructure is reliable because it includes very few mechanical elements. It is built to withstand weather extremes, with the exception of severe weather such as tornadoes and heavy ice storms. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which will likely be performed monthly by truck. Inspections will be conducted to ensure that the Transmission Line is fully functional, and that no vegetation has encroached so as to violate NESC prescribed clearances. Annual operating and maintenance costs for 345 kV transmission lines in Minnesota and the surrounding states are expected to be approximately \$1,500 per mile per year. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

5.4 Decommissioning and Repowering

At the end of the Project's useful life, the Applicant will either take necessary steps to continue operation of the Project (such as re-permitting and retrofitting) or will decommission the Project and remove facilities.

5.4.1 Decommissioning

At the end of the useful life of the Solar Facility, the Applicant will be responsible for removing all of the solar arrays and other associated facilities and restoring the site to its prior use. At the end of the anticipated 30-year Site Permit, the Applicant reserves the right to extend operations of the Project by applying for an extension of the permit to continue operation. Should the Applicant decide to continue operation, a decision would be made as to whether the Project would continue with the existing equipment or to upgrade the facilities with newer technologies.

Decommissioning of the Solar Facility at the end of its useful life, approximately 35 years or longer, would include removing the solar arrays (panels, racking and steel foundation posts), inverters, fencing, access roads, above-ground portions of the electrical collection system, lighting, substation, transmission lines, and the O&M Facility. Standard decommissioning practices will be used, including dismantling and repurposing, salvaging/recycling, or disposing

of the solar energy improvements, and restoration. A detailed decommissioning plan that follows the conditions in the MDOC recommendations is provided in Appendix H and is generally summarized below. The plan also adheres to the lease and easement agreements with landowners.

Timeline

Decommissioning is estimated to take approximately 40 weeks to complete, and the decommissioning crew(s) will ensure that all equipment and materials are recycled or disposed of properly.

Financial Resource Plan

The Applicant will be responsible for all costs to decommission the Project and associated facilities. In keeping with the EERA recommendations, the estimate of net costs should be updated periodically to recognize price trends for both decommissioning costs and the salvage and resale values of the components. Subsequent revisions to the decommissioning plan and cost estimate may be required based on changes in construction techniques and technology and changing material scrap or resale values. Under the requirements of the lease agreements and the EERA recommendations, a Financial Assurance is not anticipated during the first ten years of operation. The cost of decommissioning will be updated every five years in accordance with the EERA recommendations.

Because of the uncertainty in predicting future decommissioning costs and salvage values, the Applicant will review and update the original decommissioning plan approved by the Commission every 5 years and have a detailed financial assurance plan by year 10 of operation. At this time, the Applicant anticipates the financial assurance will either be provided in the form of a surety bond agreement, letter of credit or parental guarantee that can be accessed for decommissioning purposes. The financial assurance will increase over time until the amount of surety matches the anticipated decommissioning cost at the end of the Power Purchase Agreement. The Applicant will abide by the applicable permit condition(s) and ensure the Project is decommissioned in accordance with the terms of the Site Permit and Route Permit. In addition to MPUC permit conditions, the Applicant has included its obligation to decommission the Project components in the applicable real estate agreements.

Removal and Disposal of Project Components

The removal and disposal details of the Project components are found below.

- **Panels:** Panels will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning panels will be packed and shipped to an offsite facility for reuse or resale. Non-functioning panels will be packed, palletized and shipped to the manufacturer or a third party for recycling or disposal.
- **Racking:** Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and sent to a metal recycling facility.
- **Steel Foundation Posts:** All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a recycling facility. During decommissioning, the area around the foundation posts may be

compacted by equipment and, if compacted, the area will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

- **Overhead and Underground Cables and Lines:** All underground cables and conduits will be removed to a depth of four feet as specified in the lease agreements. Facilities deeper than 48 inches may remain in place to limit vegetation and surface disturbance. Topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. The subgrade will be compacted to a density of approximately 90 percent of Standard Proctor density. Topsoil will be redistributed across the disturbed area. Overhead lines will be removed from the HVTL and taken to a recycling facility.
- **Inverters, Transformers, and Ancillary Equipment:** All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Applicant's sole discretion, consistent with applicable regulations and industry standards.
- **Equipment Foundation and Ancillary Foundations:** The ancillary foundation for the Solar Facility are pile foundations for both equipment skids and met stations. As with the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a depth of at least 48 inches. All unexcavated areas compacted by equipment used in decommissioning will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density similar to the surrounding soils. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Applicant's sole discretion, consistent with applicable regulations and industry standards.
- **Fence:** All fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Applicant's sole discretion, consistent with applicable regulations and industry standards. Fence posts can be pulled out using skid-steer loaders or other light equipment. The surrounding areas will be restored to pre-construction conditions to extent feasible.
- **Access Roads:** Facility access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the landowner, using the following process:
 1. After final clean-up, roads may be left intact through mutual agreement of the landowner and the Applicant unless otherwise restricted by federal, state, or local regulations.
 2. If a road is to be removed, aggregate will be excavated and loaded in dump trucks using front loaders, back hoes, or other suitable excavation equipment, and shipped from the site to be reused, sold, or disposed of appropriately, at the Applicant's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. Another disposal option is to provide the aggregate to local landowners as clean fill. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de-compacted using a chisel plow or other appropriate subsoiling equipment. All large rocks will be removed. Topsoil that was stockpiled during the original

construction will be distributed across the road corridor.

Restoration/Reclamation of Facility

The Applicant will restore and reclaim the site to approximately the pre-construction condition consistent with the site lease agreement and MDOC guidelines. The Applicant assumes that most of the site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. If no specific agricultural use is identified, the Applicant will plant unvegetated portions of the site with a seed mix approved by the local SWCD or similar agency. The goal of restoration within agricultural areas will be to restore natural hydrology and plant communities to the extent practicable while minimizing new disturbance and removal of native vegetation. The decommissioning effort will implement BMPs to minimize erosion and to contain sediment on the Project to the extent practicable by:

1. Minimizing new disturbance and removal of native vegetation to the greatest extent practicable.
2. Removal of solar equipment and all access roads a minimum depth of 48 inches, backfill with subgrade material and cover with suitable topsoil to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements.
3. Stockpiling topsoil removed from the surface for decommissioning to be reused when restoring plant communities or agricultural land. Once decommissioning activity is complete, topsoil will be re-spread to assist in establishing and maintaining plant communities.
4. Stabilizing soils and returning them to agricultural use according to the landowner direction.
5. Installing erosion and sediment control measures during and after decommissioning activities, such as silt fences, bio-rolls, and ditch checks in all disturbed areas where potential for erosion and sediment transport exists, consistent with storm water management objectives and requirements.
6. Remediating any petroleum product leaks and chemical releases from equipment operation and electrical transformers prior to completion of decommissioning.

Decommissioning and restoration activities at each site will be completed within 9 months after the end of commercial operations in accordance with landowner lease and easement agreements.

Post-Restoration Monitoring

Decommissioning of the site will comply with permits for the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater General Permit, Spill Containment and Countermeasure (SPCC) Plan, and SWPPP, if grading activities are necessary and exceed applicable permit thresholds. Decommissioning may include post-restoration monitoring as required by the NPDES/SDS CSW Permit and SWPPP and other applicable requirements. In addition, the Applicant's Field Representative assigned to decommissioning monitoring will stay in contact with the landowner, including onsite check-ins until the NPDES/ SDS CSW permit is closed.

5.4.2 Repowering

As the solar market continues to produce less expensive and more efficient solar panels, repowering may be a viable option as the Solar Facility 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. The Applicant will continually evaluate the generation output, maintenance costs, and other contributing factors in conjunction with available technology upgrades to determine if repowering the Solar Facility is a worthwhile investment.

Any proposed repowering of the Solar Facility will abide by all local, state, and federal regulations. A new site permit application may be necessary and will be sought out if required.

6.0 Environmental Information

For existing conditions within the portions of land under the Applicant's control, area calculations are based on the Solar Facility boundary (1,801 acres) and not the anticipated Development Area (1,552.6 acres), which is the area needed for construction and operation of the Solar Facility based on preliminary design. This reflects the fact that final design may necessitate additional development outside of the anticipated Development Area. Additionally, for any discussions of resources that are located outside of the Solar Facility and HVTL Proposed Route (such as parks, trails, and other natural resources), the Project Area boundary is used in order to discuss the proximity of these features to the Project. The anticipated Development Area and the Proposed Route (including the 150-foot right-of-way) are used for approximating areas of temporary impact.

6.1 Environmental Setting

The Project is located in a sparsely populated rural area in between the cities of Byron and Kasson, Minnesota. From the Project Substation, Bryon is approximately 1.5 miles to the northeast, and Kasson is approximately 1.1 miles to the northwest.

Residences are scattered throughout the rural area where the land use is dominated by agricultural fields, predominately corn and soy. With the exception of U.S. Highway 14, roads that surround the Project are county or township roads. The Solar Facility is bordered on the north by U.S. Highway 14, on the south by County Road 6 (670th Street), and by County Road 15 (270th Ave) and 280th Avenue to the east. Agricultural fields border the Solar Facility to the west. The HVTL is generally north of U.S. Highway 14 and west of Byron. The Project is located on relatively flat agricultural land that is conducive to solar and transmission line development.

According to the Natural Resources Conservation Service (NRCS), the Project is located in the northern part of the Central Feed Grains and Livestock Region Land Resource Region (LRR), and the Eastern Iowa and Minnesota Till Prairies Major Land Resource Areas (MLRA). LRRs are a group of geographically associated major land resource areas, and MLRAs are geographically associated land resource units. This landscape is a nearly level to gently rolling glaciated plain with long slopes. The natural drainage network is well established and commonly described as dendritic, resulting in few lakes and ponds. Karst topography is common in this area (USDA, 1998).

The Project Area falls into the Zumbro River Watershed, and includes three subwatersheds: Cascade Creek, Salem Creek, and Masten Creek-South Branch Middle Fork Zumbro River (Watershed Alliance for the Greater Zumbro, 2021). The Project Area is generally flat, agricultural land with few wooded areas. No major river systems were identified in close proximity to the Project Area. Several creeks are located in the region surrounding the Project Area, including Cascade Creek, Masten Creek, and Salem Creek.

The MNDNR and the U.S. Forest Service have developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features (MNDNR, 2021a). Through the ECS, the State of Minnesota is split into Ecological Provinces, Sections, and Subsections. The Project Area is within the Paleozoic Plateau (222L) Section and the Minnesota & Northeast Iowa Morainal (222M) Section of the Eastern Broadleaf Forest Province. The Project is located in the Oak Savanna and Rochester Plateau Subsections (MNDNR, 2021b and 2021c).

The Oak Savanna Subsection (222Me) is part of a loess plain over bedrock or till in Southeastern Minnesota and Northeastern Iowa. With a near level to gently sloping till plain, the land is primarily used for agriculture. Glacial drift is generally less than 100 feet thick within the Oak Savanna Subsection. Soils are made up of a mosaic of Mollisols and Alfisols, making sections of wet soils and well-drained soils. Annual precipitation ranges from 28 inches in the north to 31 inches in the south. The growing season generally lasts 146 to 156 days. Fire is the most important disturbance in the subsection, but tornados and high wind event also create significant disturbances. Pre-settlement vegetation was primarily bur oak savanna, and areas of tallgrass prairie and maple-basswood forest were also common. Currently, the predominant land use in this subsection is agriculture; there are few remnants of pre-settlement vegetation remaining (MNDNR, 2021c).

The Rochester Plateau Subsection (222Lf) is comprised of level to gently rolling older till plains with dissected, loess-capped, bedrock dominated plateaus that feature gentle slopes to steep valleys and bluffs. The glacial drift over bedrock varies from 100 to 200 feet in the western portion of the Subsection, where the Project is located. Given the gentle rolling landforms of the region, the majority of the Subsection is heavily farmed. Soils are predominantly Udalfs, with areas of localized Aquents along floodplains of major rivers. Precipitation ranges from 29 inches in west to 34 inches in the southeast. The growing season typically lasts 136 to 156 days. Fire was noted as the most important disturbance in the subsection; however, tornados and ice storms have also shaped the forest vegetation. Prior to Euro-American settlement, the landscape of the Rochester Plateau Subsection was composed of tallgrass prairie and bur oak savanna (MNDNR, 2021b).

The Applicant completed a Geotechnical Engineering Report for the Project in March 2021. According to the report, the Project Area exhibits rolling hills with small elevation changes. Elevations throughout the Solar Facility range from approximately 1,224 feet amsl along the western boundary to 1,310 feet amsl along the eastern boundary. Based on U. S. Geological Survey (USGS) topographic mapping, elevations across the Proposed Route range from approximately 1,270 feet amsl near U.S. Highway 14 to 1,250 feet amsl near the Byron Substation.

6.2 Human Settlement

Generally, the townships within the Project Area are sparsely populated rural areas with farmsteads located along roads, and away from population centers. The municipalities nearest to the Project Area are Kasson and Byron. The municipal boundary of Kasson is approximately 1.1 miles northwest of the Project Substation and 1 mile west of the HVTL right-of-way. The municipal boundary of Byron is about 1.5 miles northeast of the Project Substation and approximately 0.2 mile south of the Proposed Route. Figure 1 depicts the rural landscape of the Project Area.

6.2.1 Public Health and Safety

Public health and safety issues during construction include injuries due to falls, equipment use, and electrocution. If emergency personnel were needed at the Project site, multiple services would likely respond, depending on the situation. These include the Dodge County Sheriff, Kasson Police Department, Kasson Fire Department, Dodge County Fire Department, Dodge Center Ambulance Services, Olmsted County Sheriff, Byron Fire Department, and services from the City of Rochester including the fire department, ambulance services, and police department, all of which are within approximately 15 miles of the Project Area. Additional details about emergency services within the Project Area are provided in Section 6.2.10.

There are two towers shown in the Dodge County Allied Radio Matrix for Emergency Response (ARMER) participation plan located in the cities of Dodge Center and Hayfield. In Olmsted County, five ARMER towers are located throughout the county (MDH, 2018). According to the MDH, the ARMER system is Minnesota's primary two-way public safety radio system for state agencies including police, fire, emergency medical services, county, federal and tribal governments. The radio system operates by talking to other ARMER towers via line of site transmission. To function properly and provide coverage over the entire service area, multiple towers are needed. Communication can be interrupted if very tall objects obstruct the line-of-sight between ARMER towers, which would generally be above 175 feet in Dodge County. There are no ARMER towers within 1 mile of the Project, and the nearest ARMER tower is located in the city of Dodge Center, which is approximately 5 miles west of the Project based on the Dodge County ARMER Participation Plan.

Impacts and Mitigation

The Applicant is gathering information to coordinate with emergency and non-emergency response teams, including the Dodge County Sheriff, Kasson Police Department, Kasson Fire Department, Dodge County Fire Department, Dodge Center Ambulance Services, and services from the City of Rochester and from similar response teams in Olmsted County. The type and number of responding agencies will depend on the incident requiring emergency services. The Applicant will develop an Operations and Emergency Action Plan that outlines local contacts (first responders and internal operation and maintenance staff) and emergency procedures for evacuation, fire response, extreme weather, injury, and criminal behavior. Additionally, construction will comply with local, state, and federal regulations regarding installation of the Project facilities and standard construction practices. Established industry safety procedures will be followed during and after construction of the Project; these include clear signage during all construction activities and fencing of Project facilities to prevent public access.

Solar Facility

Construction and operation of the Solar Facility will have minimal impacts on the security and safety of the local population. The solar arrays, Project Substation, and O&M Facility will be fenced and accessible only by authorized personnel. Additionally, the Applicant will have Emergency Response Plans in the event there are any public safety or health emergencies during construction or operation.

HVTL

As mentioned in Section 5.1.4, the HVTL will meet local, state, and industry-recognized design and safety standards. The HVTL will be designed to meet or exceed the standards for failure containment; weather; structure loading and strength; hardware; insulators; conductors and shield wires; wire tension; vertical and horizontal clearances; galloping; EMF clearances (see Section 6.2.2); embedments and foundations; fire regulations; aerial markers; use of dampers and spacers; lightning protection; structure grounding; bonding; fence grounding; and APLIC standards for bird flight diverters (see Section 6.6.7).

The HVTL will be equipped with protective devices (circuit breakers and relays located in substations where transmission lines terminate) to safeguard the public in the event of an accident, or if a structure or conductor falls to the ground. The protective equipment will de-energize the Transmission Line should such an event occur. Signage around the HVTL will warn the public of the safety risks associated with the energized equipment. The construction of the HVTL is not expected to have a negative impact on public health or safety. Construction crews will comply with Occupational Safety and Health Administration measures to ensure their own safety.

There are no residences within the Proposed Route right-of-way (see Section 6.2.6), and there are no structures (barns, agricultural buildings, sheds) within the right-of-way for the Proposed Route. The nearest residence is about 225 feet south of the HVTL right-of-way near 27th Avenue and the railroad tracks.

Farm equipment, passenger vehicles, and trucks may be safely used under and near the Transmission Line. The Transmission Line will be designed to meet or exceed minimum clearance requirements over roads, driveways, cultivated fields, and pasture lands specified by the NESC. Recommended clearances within the NESC are designed to accommodate a relative vehicle height of 14 feet.

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. Nuisance shocks may result when the charger is disconnected either for maintenance or when the fence is being built.

There is a potential for vehicles under HVTLs to build up an electric charge. Such buildup is rare because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the right-of-way itself because a structure under a line may interfere with safe operation of the transmission facilities. Metal buildings near power lines of 200 kV or greater must be properly grounded to mitigate induced charges.

Any landowner with questions about allowed uses beneath the HVTL or within the right-of-way can contact Byron Solar for further information about proper grounding requirements. If other problems exist, Byron Solar could conduct an inspection to assess and determine the cause of problems that may be related to the Transmission Line and identify possible solutions to such problems.

The Applicant will also work with landowners to ground fences, gates, buildings, or other structures that may be subject to induced current from the Transmission Line and educate landowners on these concerns and protective measures. If landowners identify safety concerns, they can contact their local utility or Byron Solar personnel and obtain information regarding site-specific mitigation techniques to address the situation. See Section 6.2.2.1 for a discussion on stray voltage and induced current from the HVTL.

While there are ARMER communication towers in the Project vicinity, and one within approximately 5 miles, the Project is not anticipated to impact the operation of these communication systems as Project facilities are proposed at heights below the line-of-sight of the towers (i.e., below 175 feet). The Applicant anticipates the tallest Solar Facilities will be a maximum of 15 feet above the ground, and the HVTL will consist of steel structures approximately 90 to 170 feet tall. As such, no mitigation is proposed. Therefore, operation of the Project will not interfere with the operation of the ARMER towers.

6.2.2 EMF

Electromagnetic fields (EMFs) arise from the movement of an electrical charge on a conductor such as transmission lines, power collection (feeder) lines, substation transformers, house wiring, and electrical appliances (NIEHS, 2002). The intensity of the electric portion of EMF is related to the potential, or voltage, of the charge on a conductor, and the intensity of the magnetic portion of the EMF is related to the flow of charge, or current, through a conductor. EMFs are invisible just like radio, television, and cellular phone signals, all of which are part of the electromagnetic spectrum.

Magnetic fields are created by the electrical current (measures in amperes) moving through a transmission line. The strength of a magnetic field is proportional to the electrical current and is typically measured in milliGauss (mG). As with electric fields, the strength of a magnetic field decreased rapidly as the distance from the source increases. Unlike electric fields, however, magnetic fields are not shielded or weakened by objects or materials.

There are presently no Minnesota regulations pertaining to magnetic field exposure. The internationally accepted guideline for the general public exposed magnetic fields is 833 mG (NIEHS, 2002).

Solar Facility

The primary sources of EMF from the Solar Facility will be from the solar arrays, buried electrical collection lines, and the transformers installed at each inverter. Solar arrays generate EMF in the same extremely low frequency (ELF) range as electrical appliances and wiring found in most homes and buildings. The average daily background exposure to magnetic fields is estimated to be around 1 mG but can vary considerably depending on a person's exposure to EMF from household electrical devices and wiring. The lowest exposure level that has been potentially associated with a health effect is 3 mG (Massachusetts Clean Energy Center, 2015).

Based on various studies compiled by North Carolina State University, EMF health and safety impacts from solar energy facilities were found to be negligible. According to Cleveland (2017), photovoltaic systems generate EMF; however, someone outside the fenced perimeter of a solar facility is not exposed to significant EMF from the solar facility. The strength of extremely low frequency (ELF)-EMF present at the perimeter of a solar facility or near a photovoltaic system in a commercial or residential building is significantly lower than the typical American's average EMF exposure. Researchers in Massachusetts measured magnetic fields at photovoltaic projects and found the magnetic fields dropped to very low levels of 0.5 mG or less, and in many cases to less than background levels (0.2 mG), at distances of no more than 9 feet from the residential inverters and 150 feet from the utility-scale inverters. Even when measured within a few feet of the utility-scale inverter, the ELF magnetic fields were well below the International Commission on Non-Ionizing Radiation Protection's recommended magnetic field level exposure limit for the general public of 2,000 mG. Cleveland (2017) concluded there is no negative health impact from the EMF produced in a solar facility.

HVTL

The frequency of transmission line EMFs in the United States is 60 hertz and falls in the ELF range of the electromagnetic spectrum (any frequency below 300 hertz). For the lower frequencies associated with power lines, the EMFs are typically evaluated separately.

Electric fields on a transmission line are solely dependent upon the voltage of the line, not the current. Electric-field strength is measured in kilovolts per meter (kV/m), and the strength of an electric field decreases rapidly as the distance from the source increases. Electric fields are easily shielded or weakened by most objects and materials, such as trees or buildings.

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/m measured at 1 meter (3.28 feet) above the ground³. The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternating current transmission lines of 500 kV or greater⁴.

³ In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (adopting Administrative Law Judge Findings of Fact, Conclusions and Recommendation at Finding 194 [April 22, 2010 and amended April 30, 2010]) (September 14, 2010).

⁴ See "Public Health and Safety Effects of High Voltage Overhead Transmission Lines" prepared by Robert S. Banks, Minnesota Department of Health (MDH), 1977.

Impacts and Mitigation

Solar Facility

EMFs from underground electrical collection and feeder lines dissipate very quickly and relatively close to the source because they are installed below ground to a depth of approximately 48 inches and are heavily insulated and shielded. Consequently, the electrical fields that emanate from buried lines and transformers are generally considered negligible, and magnetic fields often decrease significantly within approximately 3 feet of stronger EMF sources (such as transmission lines and transformers) (NIOSH, 1996). Canadian wind farm studies of collection lines of similar voltage found magnetic fields associated with buried electrical collection lines to be within background levels at one meter above ground (McCallum et al., 2014).

In addition, measurements at three commercial solar arrays in Massachusetts demonstrated that their contributions to off-site EMF exposures were low (less than 0.5 mG at the fenced boundary), which is consistent with the drop off of EMF strength based on distance from the source (Massachusetts Clean Energy Center, 2015).

Underground collection lines and inverters will be sited well away from existing residences, with nearest inverter about 528 feet, and the nearest 34.5 kV collection lines are about 215 feet from a residence (Maps 3 and 4). By siting the facilities in this manner, it is anticipated that EMF related to underground collection and inverters will be maintained at background levels (levels typically found around normal household appliances). At this distance, both electric and magnetic fields will have dissipated to background levels. As such, impacts will be negligible, and no mitigation measures are proposed.

HVTL

Levels of EMF from the HVTL will be considerably below acceptable Minnesota limits for electric fields and international guideline for magnetic fields.

Project-specific EMF levels have not been modeled for the 345 kV Transmission Line at this time. However, several studies have documented EMF exposure of various HVTLs. The National Institute of Environmental Health Sciences (NIEHS) provides typical EMF levels for power transmission lines. For 230 kV transmission lines, electric fields directly below the transmission line were reported at 2.0 kV/m before dissipating to 1.5 kV/m at 50 feet. Similarly, average magnetic fields directly below the transmission line were reported at 57.5 mG before dissipating to 19.5 mG at 50 feet. For 500 kV transmission lines, electric fields directly below the transmission line were reported at 7.0 kV/m before dispersing to 3.0 kV/m at 65 feet. Average magnetic fields directly below the transmission line were reported at 86.7 mG before dissipating to 29.4 mG at 65 feet. The NIEHS concluded that EMF from transmission lines dissipates rapidly with distance from the source (NIEHS, 2002). Based on these studies, the magnetic fields within the proposed HVTL right-of-way are expected to be between 19.5 mG and 29.4 mG and potentially less since the right-of-way extends further than the reported distances (the strength of magnetic fields decrease with distance).

Additionally, an evaluation of electric fields measurements from the Omaha Public Power District (OPPD) were conducted on the District's 345 kV 60-Hz transmission lines. OPPD measured electric fields from a variety of potential transmission line structures, including a lattice tower, tubular H-frame, wooden H-frame, and single steel pole. For the purposes of the analyses, OPPD used a standard conductor design height of 31 feet. The Applicant is proposing

to use steel monopoles for construction of the Transmission Line as discussed in Section 5.1.4. The measured electric field at a distance of 5 feet on either side of a 345 kV single steel pole was measured to be 4.4 kV/m before dissipating to 1.0 kV/m at a distance of 40 feet. The Applicant is implementing a 150-foot right-of-way (75 feet on either side) for the HVTL. The OPPD study indicated an electric field of 0.1-0.2 kV/m at a distance of 70 feet on either side of a 345 kV single steel pole (Bruening, 1987).

According to a report published by the New Zealand Ministry of Health, after 30 years of studying magnetic fields, there is still no persuasive evidence that the fields pose any health risks (Ministry of Health, 2013). Additionally, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMFs (Minnesota State Interagency Working Group, 2002).

As demonstrated above, both electric and magnetic fields are expected to be well below the Minnesota guidelines for electric fields (8 kV/m) and international guidelines of 833 mG for magnetic fields. Vertical clearances of approximately 40 feet above roadways and rights-of-way will be maintained to ensure these limits are met.

To ensure EMFs are below the Minnesota guidelines for electric fields (8 kV/m) and international guidelines of 833 mG for magnetic fields, the Applicant conducted a project-specific EMF study (Appendix O). EMFs for the transmission line were calculated in PLS-CADD based on the Electric Power Research Institute Red Book methodology (EPRI, 1982). Based on study findings, the largest electric field and magnetic field along the Byron transmission line is 4.8 kV/m (span 17-18) and 56 mG (span 10-11), respectively. Both values are acceptable, as the electric field is below the 8 kV/m limit. There are no standards in Minnesota that restrict the magnetic field.

6.2.2.1 Stray Voltage

Stray voltage encompasses two phenomena: neutral-to-earth voltage (NEV) and induced voltage. NEV is a type of stray voltage that is most associated with local distribution lines and electrical wiring within buildings at a residence or on a farm. Transmission lines do not create stray voltage as they do not directly connect to residences, or farms. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Section 6.2.1 provides additional details on stray voltage and induced current as they relate to allowable uses beneath and around the HVTL, minimum clearances beneath the HVTL, and livestock operations. Stray voltage does not cause electrocution and is not related to ground current, EMF, or earth currents.

Induced voltage is the electric field from a transmission line that can extend to nearby conductive objects such as farm equipment. The primary concern with induced voltage is the current that flows through a person to the ground when touching the object. To ensure safety in the proximity of transmission lines, the NESC requires that any discharge be less than 5 milliAmperes. In addition, the Commission's electric field limit of 8 kV/m is designed to prevent serious shock hazards due to induced voltage. Proper grounding of metal objects under and adjacent to HVTLs is the best method of avoiding these shocks.

Appropriate measures, such as proper grounding, will be taken to prevent stray voltage problems. All electrical components in the Project, including inverters and transformers, will be grounded in accordance with the NESC. Soil resistivity measurements will be taken on site as

part of the Project's geotechnical analysis, and that data will be used to help design grounding systems and minimize stray voltage.

Constructing the project to NESC standards and Commission route permit requirements will mitigate stray voltage concerns. Therefore, potential impacts from stray voltage are anticipated to be minimal.

6.2.3 Displacement

Displacement can occur when residences or other buildings are located within a proposed project area or right-of-way. In this instance, they are generally removed or displaced. Displacements are relatively rare and are more likely to occur in heavily populated areas where avoiding all residences and businesses is not always feasible.

Solar Facility

There are no residences, business, or structures such as barns or sheds located within the anticipated Development Area (Maps 3 and 4). While several residences and structures are located within close proximity to Solar Facility components, the Applicant will adhere to a minimum distance of 200 feet from a residence. No residences, businesses, or structures will be removed or displaced.

HVTL

There are no residences, business, or structures such as barns or sheds located within the HVTL right-of-way. The closest residence is approximately 225 feet from the edge of the HVTL right-of-way, therefore, there will be no displacement as a result of the Project (Maps 3 and 4).

NESC standards require certain clearances between transmission line facilities and the ground, and between transmission line facilities and buildings for safe operation of the transmission line. To comply with NESC standards and allow sufficient space for transmission line maintenance, transmission lines are generally routed to avoid residences or other buildings within the right-of-way.

The Proposed Route crosses sparsely populated rural areas that are primarily used for agricultural production. To limit proximity to residences and other buildings, the Applicant designed a route and alignment that is co-located along existing roadways and field edges where residences are typically not present. The Applicant has made every effort to site the Transmission Line away from buildings and residences.

Impacts and Mitigation

Displacement is not anticipated because no residences, businesses, or structures are located within the anticipated Development Area or the proposed Transmission Line right-of-way (i.e., within 75 feet of the Transmission Line centerline). Therefore, no mitigation is proposed. Buildings and homes are displayed on Maps 3 and 4 in Appendix B.

6.2.4 Noise

Noise is defined as unwanted sound. It may be made up of a variety of sounds of different intensities, across the entire frequency spectrum. 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 scale (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.

Pre-Construction Noise

Common sound sources within an agricultural and/or rural environment include, but are not limited to, sound from farm equipment such as tractors and combines, sound generated from traffic on roadways, sounds from birds, and wind rustling through the vegetation. Typically, the ambient acoustic environment of a rural or agriculturally oriented community has equivalent continuous sound levels (Leq, which is an energy-based time-averaged noise level) ranging from 30 dBA to 60 dBA.

The background noise in the vicinity of the Project facilities is typically a result of farming equipment/operations, wind, and vehicles. A comparison of typical noise-generating sources is outlined in Table 10 (MPCA, 2008).

Table 10: Common Noise Sources

Sound Pressure Level (dBA)	Common Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Noise Standards

The MPCA has the authority to adopt noise standards pursuant to Minn. Stat. §116.07, subd. 2(c). The adopted standards are set forth in Minn. R. Chapter 7030. The MPCA standards require A-weighted noise measurements. Different standards are specified for daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) 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). The Project Area is considered a Noise Area Classification 1 (NAC 1) with daytime noise allowances of 60 decibels (dBA) and nighttime noise

allowances of 50 dBA according to the Minn. Stat. §116.07 and Minn. R. Chapter 7030 noise ordinance. Table 11 depicts the MPCA state noise standards.

Table 11: MPCA State Noise Standards - Hourly A-Weighted Decibels

Noise Area Classification	Daytime (7:00 a.m. – 10:00 p.m.)		Nighttime (10:00 p.m. – 10:00 a.m.)	
	L10	L50	L10	L50
1 – Residential ¹	65	60	55	50
2 – Commercial	70	65	70	65
3 – Industrial	80	75	80	75

¹ NAC 1 includes rural residential household units.

Construction Noise

During construction, noise will be emitted by the construction vehicles and equipment onsite. The amount of noise will vary based on what type of construction is occurring at the Project on a given day. These noise impacts will be temporary and limited to daytime hours. Construction associated noise will likely be perceptible at nearby residences although none are located within the Project Area.

The Applicant anticipates impact driving of the pilings to be the most significant source of construction noise. The Roadway Construction Noise Model (RCNM) was used to determine maximum sound levels based on distance from receptors. The Applicant used the RCNM to determine the noise level created by an Impact Pile Driver measured at 200 feet from a residence (the minimum distance between a residence and solar array). Based on the results, the maximum Leq would be 82 dBA (FHWA, 2006). The noise from construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. The average distance from area homes to the proposed solar arrays is roughly 380 feet. Construction activities will likely be sequenced across the Project, with site preparation occurring at some array locations and pile driving at others. Additionally, construction and staging activities are scheduled to occur during daytime hours to minimize noise impacts to nearby residences.

Operational Noise

Solar Facility

The main sources of noise from the Solar Facility during operation will be from the inverters and the Project Substation transformer. All electrical equipment will be designed to National Electrical Manufacturer Association (NEMA) Standards. The Applicant plans to use SMA Solar Technology, or equivalent, inverters, which were modeled for the Solar Facility.

The Applicant conducted a noise propagation and modeling assessment for the proposed inverters and proposed Project Substation transformers (Appendix I). This project is required to comply with Minnesota Rules 7030.0010-7030.0080. All receptors in the Project Area are classified as NAC (Noise Area Classification) 1 (Residential Units). The maximum noise levels for NAC 1 are as follows:

NAC Classification	Daytime limit (dBA)	Nighttime limit (dBA)
NAC 1	60	50

It is assumed that the Solar Facility will only operate during daytime hours, thus an impact threshold of 60 dBA was used.

Predicted noise levels were determined using the Cadna-A noise propagation and modeling software. Existing background noise levels were assumed to be 40 dBA, in accordance with ANSI S12.9-13/Part 3 Category 6: Very Quiet Rural Residential. Noise levels for the inverters were provided by the manufacturer. Transformer noise was modelled according to maximum allowable levels published in NEMA-TR1.

Using this data, noise contours for project noise were generated for the Project Area and presented in Exhibit 5. Additionally, future noise levels, (project contribution plus ambient) were calculated for all identified receptors within a screening distance of 500 feet.

The loudest predicted level at a receptor is 42 dBA (receptor 4), well below the daytime limit of 60 dBA. The predicted noise concentration zones and propagation model are shown on the attached Exhibits 2-4, Appendix I. There are no predicted impacts, and the project complies fully with MN Rules 7030.0010-7030.0080.

HVTL

A transmission line can generate a small amount of sound due to corona activity. Corona is the manifestation of energy loss through the line, and this energy loss can produce sound, such as buzzing or crackling. This noise can be greater in rainy or foggy conditions. During heavy rains, the sound of the rain generally is greater than the noise emitted from the transmission line and thus the transmission line noise is not noticeable. Transformers and transmission lines are equipped with circuit breakers which open to de-energize the transformers and transmission lines for fault conditions and for maintenance. As such, the circuit breakers are rarely opened and closed, at which time there is sound associated with the mechanical operation of the breakers. Circuit breakers do not emit a humming noise.

Corona noise levels depend on the presence of foul weather, the transmission line conductor design, operating voltage, and the distance from the transmission line. As mentioned above, potentially significant corona-generated noise is only produced during inclement weather. The closest residence is located approximately 225 feet from the Proposed Route right-of-way. Several other backyards are just south of the railroad tracks, but the residences are setback between 296 feet and 1,178 feet from the HVTL right-of-way.

Impacts and Mitigation

Solar

Construction noise will be temporary in duration, limited to daytime hours and relatively minimal, and will return to background levels of 40 dBA during the day and 34 dBA at night once construction is finalized. The Project is required to comply with Minnesota Rules 7030.0010-7030.0080. The loudest predicted level at a receptor is 42 dBA (Receptor 4), well below the daytime limit of 60 dBA. The predicted noise concentration zones and propagation model are shown in Appendix I. There are no predicted impacts, and the Project fully complies with MN Rules 7030.010-7030.0080. During construction, the Applicant plans to limit

construction to daylight hours. Equipment used for construction will be in good working condition and properly muffled to reduce sound generation to the greatest extent practicable. Construction activities are closely supervised by an on-site construction management team.

Solar Facility noise modeling of inverter and substation equipment determined that ambient levels were generally reestablished within the Solar Facility boundary, and therefore no increased sound levels are expected outside the Solar Facility or at nearby occupied dwellings. Because no noise impacts from operation of the Solar Facility are expected, no additional mitigation is proposed.

HVTL

During fair conditions, noise from the transmission line is anticipated to be inaudible. The Transmission Line may produce noise during rainy conditions due to the corona effect, a type of electrical conduction that occurs in the atmosphere near the conductor that may result in an audible hissing and cracking sound. It is likely, however, that most of the time when climatic conditions result in corona, the noise levels of falling rain would exceed the corona noise making the noise from the Transmission Line inaudible. Additionally, any minor corona or wind-related noise from the Transmission Line maybe be heard at nearby residences given the closest is 225 feet away and is partially separated from the Transmission Line by a garage and scattered trees. Based on the distance, and distances of the remaining residences (296 feet and 1,178 feet from the HVTL right-of-way), operation of the HVTL is not expected to create noise impacts and no additional mitigation is proposed.

6.2.5 Radio and Television Interference

The Applicant has conducted online research to identify radio, television, and cell phone towers located within the vicinity of Project. The results of this review and a discussion of potential impacts to these services from operation of the Project are presented below.

6.2.5.1 Radio

There are numerous Amplitude Modulation (AM) and Frequency Modulation (FM) radio broadcasting stations such as KZSE (91.7 FM), KFSI (92.9 FM), KWWK (96.5 FM), KNXR (97.5 FM), KAUS (99.9 FM), KRCH (101.7 FM), KYBA (105.3 FM), KROC (106.9 FM), KDHL (920 AM), KQAA (970 AM), KFAN (1270 AM), KROC (1340 AM), AND KOLM (1520 AM) that operate or can be heard within the vicinity of the Project.

6.2.5.2 Television

There are more than 18 digital channels broadcast in the vicinity of the Project; these channels would be received from cities including Rochester and Austin, Minnesota; and Mason City, Iowa.

6.2.5.3 Cellular Phone

There are no cellular towers located in the Project Area. One cellular tower is located immediately adjacent to the Solar Facility boundary and is associated with ALLTEL Corporation and AT&T Spectrum, LLC. Several cellular phone service providers operate in the vicinity of the Project, including large carriers like Verizon, AT&T, Sprint, T-Mobile, Boost Mobile, Straight Talk, and Republic Wireless.

6.2.5.4 Global Positioning System (GPS)

GPS applications are important components of daily life, used in aviation, vehicle navigation, surveying, and agricultural activities. GPS equipment relies on satellites and typically mobile receiver equipment to provide locational information for navigation between endpoints, as well as geographic orientation for farm and other equipment. GPS equipment is likely used throughout the vicinity of Project.

Impacts and Mitigation

Solar Facility

No radio or television impacts are anticipated as a result of the Solar Facility. The low height of proposed infrastructure will not negatively impact the operation of radio, television, or communication signals; thus, no mitigation is proposed.

HVTL

Operation of transmission lines has the potential to interfere with reception of radio, television, cellular, and GPS signals. Electromagnetic noise generated from the HVTL can cause interference with the reception of signals depending on the frequency and strength of the signals. Table 12 identifies the potential impacts to communication systems and provides mitigation options should interference be realized. However, as described below, significant impacts on radio, television, cellular phones, or GPS systems are not anticipated from construction or operation of the HVTL.

Table 12: HVTL Potential Impacts and Mitigation on Telecommunications

Resource	Potential Impact	Mitigation
AM Radio	Interference from corona-related noise typically immediately under the HVTL and within the right-of-way. Because there are no homes immediately under or near the HVTL route, impacts are not anticipated.	If interference is determined from the HVTL, reception can be restored by modifications to the receiving antennas (such as a high-gain system).
FM Radio	FM radio receivers are generally not affected by corona-related interference and therefore impacts are not anticipated.	Not anticipated.
Television	Interference to over-the-air television communications could occur if a structure is aligned between a receiver and signal. However, impacts are not anticipated given the proximity of existing homes to the HVTL route. Satellite and digital television are not affected by corona noise.	If determined that interference to over-the-air television reception has occurred as a result of the HVTL, the Applicant will work with individual landowners to confirm the impact and restore reception to pre-construction conditions by either providing a high-gain antenna system, or digital/satellite television if the high-gain antenna system does

Table 12: HVTL Potential Impacts and Mitigation on Telecommunications

Resource	Potential Impact	Mitigation
		not resolve the issue.
Cellular Phone and Global Positioning System (GPS)	These systems use high-frequency signals significantly higher than those generated by coronal noise. Consequently, neither cellular phone nor GPS systems are anticipated to be affected.	No impacts are anticipated and therefore no mitigation is proposed.

6.2.6 Aesthetics

Land use in the Project Area is characterized as agricultural with 96.9 percent converted to row crop agriculture. Aside from agricultural fields, the landscape also supports a patchwork of woodlands, wetlands, and drainages. The topography of the Project Area is generally flat with slopes generally ranging from 1 to 6 percent. Minimal areas with slopes greater than 6 percent are present in the Project Area.

Viewsheds in this area are generally broad and uninterrupted, with only small, scattered areas where they are defined by trees or topography. The settlements in the vicinity are residences and farm buildings (inhabited and uninhabited farmsteads) scattered along rural county and township roads. Most of these farmsteads are at least partially surrounded by woodlands or shelterbelts, which fractionally prevent uninterrupted views of the surrounding landscape.

Siting utility-scale solar projects in rural environments can change the overall aesthetics of the landscape by introducing a commercial-like facility into an otherwise agricultural setting. Similar to wind farms, solar arrays may be viewed by some as a disruption to the existing agricultural landscape, and by others as a welcomed complimentary use to farming practices (harvesting solar energy, soil resting, and creation of pollinator-friendly habitats). Consequently, aesthetics related to utility-scale solar is largely one of personal perspective and preference.

The Project Substation is located just south of U.S. Highway 14 in agricultural fields and is not surrounded by woodlands or otherwise obstructed by vegetation or trees. Additionally, there are several transmission lines within or adjacent to the Project Area that interrupt natural agricultural views as shown on Map 8.

At least six transmission lines extend south of the Byron Substation and one additional line extends to the north. Transmission line easements between the cities of Byron and Kasson house several of the identified transmission lines, several others travel alongside U.S. Highway 14. Views in the area are naturally interrupted by U.S. Highway 14 immediately north of the Solar Facility, and other county and township roadways. The existing transmission lines, substation, and surrounding roadways are the current man-made focal points, along with multiple wind turbines at several operating wind farms. Existing wind farms in close proximity to the Solar Facility are summarized in Table 13.

Table 13: Proximity of Existing Wind Farms to Solar Facility

Project Name	Number of Turbines	Distance from Solar Facility
McNeilus Wind Farm	41	5.6 miles
Pleasant Valley Wind Farm	100	8.1 miles
Wapsipinicon Wind	67	12.4 miles

Solar Facility

There are no residences or businesses within the anticipated Development Area; however, there are 18 residences and several agricultural buildings on parcels adjacent to the Solar Facility (see Map 3). Table 14 provides distances to the nearest residences to the Solar Facility, including approximate distance to the anticipated Development Area boundary and approximate distance to the edge of preliminary solar array locations.

Table 14: Proximity of Residences to Solar Facility

Residence¹	Distance to Development Area (feet)	Distance to Solar Arrays (feet)²	Distance to Nearest Inverter (feet)²	Vegetative Screening from Solar Facilities
1	345	468	943	The existing vegetation on the western side of the property will screen the residence from the proposed solar facilities.
2	315	414	1,285	Residence is surrounded by existing vegetative screening along all sides of the farmstead.
3	485	570	1,255	Residence has existing vegetative screening along all sides of the property.
4	170	275	544	Residence has existing vegetation and will be screened from the proposed solar facilities.
5	165	205	818	Residence is surrounded by existing vegetative screening along the sides of the farmstead.
6	335	384	965	Residence has some existing vegetative screening along the southern side of the farmstead, screening the residence from the solar panels.
7	190	234	830	Residence has existing vegetative screening along all sides, which will fully screen the residence from the solar panels.

Table 14: Proximity of Residences to Solar Facility

Residence¹	Distance to Development Area (feet)	Distance to Solar Arrays (feet)²	Distance to Nearest Inverter (feet)²	Vegetative Screening from Solar Facilities
8	402	492	522	Residence has existing vegetative screening along the west, south, and east sides of the property. Several agricultural buildings screen the residence to the north.
9	183	224	833	Residence has existing vegetative screening along all sides of the property, including towards the proposed solar panels to the south.
10	237	327	1,216	Residence has existing vegetative screening around all sides of the farmstead, including the northern side adjacent to the Solar Facility.
11	435	495	1,287	Residence has existing vegetative screening around the northern and western sides of the farmstead, screening the residence from the proposed solar infrastructure to the north.
12	334	402	979	Vegetation and trees are present on all sides of the farmstead, sufficiently screening the home from the proposed solar infrastructure.
13	513	636	1,470	Residence surrounded by trees and vegetation, screening the residence from the proposed solar infrastructure.
14	350	527	1,360	Residence has screening on the western side of the property, adjacent to the proposed solar panels.
15	30	152	595	Residence has existing vegetative screening around all sides of the farmstead, including the eastern side adjacent to the Project.
16	150	203	818	Residence has existing vegetative screening along all sides of the property.
17	335	435	1,095	Residence has existing vegetative screening along all sides of the property.

¹ Residences 8, 9, and 12 are participating landowners.

² Based on preliminary Project layout. The final layout will be adjusted after parcel lines and neighboring buildings are surveyed to maintain the minimum setbacks required.

HVTL

The nearest residence is located about 225 feet south of the HVTL right-of-way near 270th Avenue and the railroad tracks. Several other backyards are just south of the railroad tracks, but the residences are setback between 296 feet and 1,178 feet from the HVTL right-of-way.

Impacts and Mitigation

Solar Facility

Aesthetics and views in and near the Solar Facility will be modified, however, as mentioned, aesthetics related to utility-scale solar tends to be one of personal preference and perspective. Approximately 1,529.7 acres or less of agricultural land will be converted to solar panels, inverters, access roads, a Project Substation, an O&M Facility, and security fencing. The facilities will look somewhat different from the existing landscape. However, some of these features such as gravel roads, electric transmission and distribution lines and substations already exist on the landscape. A portion of the anticipated Development Area will be covered with rows of solar panels as shown in Map 3. The panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating to reduce reflection. Glint and glare from the panels are reduced by using dark colors to absorb rather than reflect light. During manufacturing, panels are coated to reduce light reflection. Typically, solar panels only reflect 2 percent of light. Arrays will be a maximum height of 4-6 feet off the ground surface at full tilt and at noon depending upon the panel type used.

It is expected that there will be minimal visual impacts from the Solar Facility and associated facilities. Locations where visual impacts may potentially be the greatest are adjacent to residences and along public roadways and trails. The solar arrays will be visible from adjacent roadways, parcels, and snowmobile trail, but given their relative low profile, and the fact they will be fenced for security, they will not be visible from significant distances. Photographs showing current conditions, followed by visual renderings, depict how the facility is anticipated to look from three separate vantage points around the Solar Facility. Views 1-6 show the existing and simulated views.



View 1: Existing View south of 650th Street



View 2: Simulated View south of 650th Street



View 3: Existing View north of 655th Street



View 4: Simulated View north of 655th Street



View 5: Existing View east of 270th Avenue



View 6: Simulated View east of 270th Avenue

Trees will be largely avoided with equipment installation which will maintain natural visual barriers from surrounding parcels and homes. The average distance from nearby homes to sited solar panels based on the preliminary layout is nearly 380 feet. As described above, all of the nearest 17 residences are at least partially surrounded by natural vegetation screening, which should help block direct views of the Solar Facility to some extent. The Applicant has

coordinated with adjacent landowners and has proposed a variety of visual screening treatments at different areas throughout the Solar Facility to minimize and mitigate the visual effects. Details on the visual screening treatments are located in Appendix L. The Applicant will continue to coordinate with adjacent landowners.

Operational lighting will be required at gates and perimeter areas as necessary for safety and security. Lighting will be motion-activated and down lit to minimize impacts and effects. Impacts to light-sensitive land uses are not anticipated given the rural location coupled with minimal required lighting for operations.

Construction of a 6.8-acre Project Substation and 2.6-acre O&M Facility in an existing agricultural field will also present new visual impacts. Two structures will be within the Project Substation: the collector pole at 60 feet tall and a deadend pole at 95 feet tall. These poles will on average have the profile of a single-story building and will consist of high voltage electrical equipment. The O&M Facility will include the SCADA system, and provide a place for maintaining and storing equipment, and employee parking. In addition, down-shielded lighting will help to maintain security while minimizing lighting impacts.

HVTL

The transmission line structures and conductors would create aesthetic impacts that are anticipated to be minimal to moderate. While there are several transmission lines connected to the Byron Substation, including 345 kV lines, the additional HVTL will result in visual impacts in an area where there are fewer existing transmission lines. The HVTL will alter the current landscape through construction of steel poles of 90 to 170 feet tall. The Applicant has minimized aesthetic impacts by proposing a route where the transmission line is most harmonious with the landscape, such as along roads, railroads, and field edges.

Other minimization measures include crossing streams using the shortest distance possible (i.e., perpendicular to the waterbody), avoiding placing structures directly in front of residences, and using construction methods that minimize damage to vegetation near the Transmission Line.

6.2.7 Socioeconomics/Environmental Justice

Socioeconomic information was obtained from NREL's Jobs and Economic Development Impact (JEDI) model and the U.S. Census Bureau's 2019 American Community Survey 5-Year Estimates (U.S. Census Bureau, 2021). To sufficiently identify small concentrations of minority populations ⁵ and low-income populations ⁶, data is provided at the township and county level.

As calculated using the JEDI model with Impact Analysis for Planning (IMPLAN) multipliers, the Project is expected to produce beneficial socioeconomic effects to the area. The Minnesota solar energy production tax rate is \$1.20 per MWh, which equates to about \$400,000 to \$450,000 annual county production tax revenue and \$100,000 to \$125,000 annual township production tax revenue. The Project is expected to generate about \$15.6 million in local tax

⁵ Minority populations may consist of groups of culturally different subpopulations with different impacts and outreach needs. These populations can be dispersed throughout the Project area or reside in tightly clustered populations. Minority was initially defined by the EJ IWG in an Appendix to the 1997 CEQ EJ Guidance as "individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic" (EJ IWG, 2019).

⁶ Low-income populations can be identified by the individuals below the poverty level, households below the poverty level, and families with children below the poverty level (EJ IWG, 2019).

revenues over a 30-year period. Annual lease payments to landowners will exceed \$1 million in the first year and will increase every year with scheduled increments. This equates to about \$65 million paid to landowners over the lifespan of the Project. Landowners will be reimbursed for any additional tax burden resulting from the new land use classification.

The Project is expected to support 293 temporary jobs during the construction and installation phases, and up to 5 indirect and 4 full time permanent skilled jobs during the operations phase. As described in the attached Economic Impact Study (Appendix N), indirect jobs, or induced jobs, are modeled FTEs that are spurred by on-going local investment and additional dollars exchanged in the community (e.g., gas station attendants, staff at local restaurants, vegetation management contractors, etc.). Temporary construction jobs within Dodge County will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. As an operating facility, the Solar Facility will annually generate over \$1.4 million in new local long-term earnings for the State of Minnesota, and over \$452,000 in new local long-term earnings for Dodge County, annually as calculated in the attached Economic Impact Study (Appendix N).

Adverse impact to socioeconomics will be limited to the temporary loss of the agricultural production on the land currently farmed. However, these temporary losses are negated by the payments to the landowners from the Project.

Environmental Justice (EJ) refers to the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (MPCA, 2015). In general, EJ is intended to ensure all people benefit from equal levels of environmental protection and have the same opportunities to participate in decisions that may affect their environment or health (USEPA, 2021b).

According to the MPCA, electricity generation has historically been a major source of air pollution in Minnesota and is the second largest source of greenhouse gas emissions (and is also the sector in which the greatest reductions in emissions have occurred). The MPCA developed a data and mapping tool to explore how changes in the electricity generation system in Minnesota may impact communities around the state, especially communities of concern for environmental justice (MPCA, 2021a). Based on the most recent emissions data from 2015, there are no sources of emissions within the Project Area. The nearest source of emissions is in Rochester, about 8 miles east of the Project Substation (MPCA, 2021b).

The discussion herein does not address every socioeconomic and EJ measure, but instead addresses the most applicable statistics related to the Project. The socioeconomic statistics that best characterize the demographic and economic context of the Project Area and represent the socioeconomic characteristics that potentially could be affected by construction and operation of the Project, include population and race, housing, and income and poverty.

Population and Race

Population and race characteristics for Mantorville and Canisteo townships and Dodge County are detailed in Table 15. The two townships have very small populations compared to the county. The population of Dodge County in 2019 was estimated to be 20,669 with a median age of 38.4 years. Mantorville Township had an estimated population of 1,817 and a median age of 44.9 years, and Canisteo Township had an estimated population of 583 and a median age of 49.6

years. Both townships have a higher median age than the county, and Mantorville Township has a higher population, more than twice as many people, than Canisteo Township.

The predominant race in Mantorville Township, Canisteo Township, and Dodge County is White (alone, not Hispanic or Latino), and less than five percent of the population is categorized as a minority population. The largest minority population in Dodge County is comprised of residents who identify as Hispanic or Latino Origin (of any race), the largest minority population in Mantorville Township includes residents who identify as Two or More Races, and similar to the county, the largest minority population in Canisteo Township is comprised of residents who identify as Hispanic or Latino Origin (of any race).

Based on these statistics, there is no indication that minority populations are concentrated within the Project Area, or that the Project is located in an area occupied by a minority population.

Table 15: Population and Race Characteristics in Dodge County

Category ¹	Mantorville Township	Canisteo Township	Dodge County
Total Population	1,817	583	20,669
Median Age	44.9	49.6	38.4
Race and Hispanic or Latino Origin			
One Race (%)	98.4	99.8	98.6
White (%)	98.0	99.7	94.7
Black or African American (%)	0.0	0.0	0.3
American Indian or Alaska Native (%)	0.0	0.0	0.4
Asian (%)	0.0	0.2	0.9
Native Hawaiian/Pacific Islander (%)	0.0	0.0	0.0
Some Other Race	0.4	0.0	2.3
Two or More Races	1.6	0.2	1.4
Hispanic or Latino Origin (of any race)	0.9	2.2	5.0
White Alone, not Hispanic or Latino	97.5	97.4	92.2
Population Density (per square mile)	57.3	16.3	47.1
¹ Data retrieved from the 2019: ACS 5-Year Estimates Subject Table, Selected Characteristics of the Total and Native Populations, Table ID: S0601.			

Population and race characteristics for Kalmar Township and Olmsted County are detailed in Table 16. The Project is located between the cities of Kasson and Bryon, and is west of Rochester, Minnesota. The population of Olmsted County in 2019 was estimated to be 154,809 with a median age of 37.2 years, and Kalmar Township had an estimated population of 1,113 and a median age of 51.1 years. Kalmar Township's median age is much higher than the county.

The predominant race in Kalmar Township and Olmsted County is White (alone, not Hispanic or Latino). The largest minority population in Kalmar Township includes residents who identify

as Hispanic or Latino Origin (of any race), and the largest minority population in Olmsted County is comprised of residents who identify as Black or African American.

Table 16: Population and Race Characteristics in Olmsted County

Category ¹	Kalmar Township	Olmsted County
Total Population	1,113	154,809
Median Age	51.1	37.2
Race and Hispanic or Latino Origin		
One Race (%)	100.00	97.2
White (%)	98.5	83.7
Black or African American (%)	0.0	6.2
American Indian or Alaska Native (%)	0.0	0.4
Asian (%)	1.5	5.8
Native Hawaiian/Pacific Islander (%)	0.0	0.1
Some Other Race	0.0	1.0
Two or More Races	0.0	2.8
Hispanic or Latino Origin (of any race)	9.3	4.9
White Alone, not Hispanic or Latino	89.1	80.1
Population Density (per square mile)	34.2	236.9
¹ Data retrieved from the 2019: ACS 5-Year Estimates Subject Table, Selected Characteristics of the Total and Native Populations, Table ID: S0601.		

Housing

Dodge County had an estimated 8,241 total housing units in 2019 with 485 vacant housing units. While Mantorville Township had over twice as many housing units (671) as Canisteo Township (251), they both had one vacant house for every 15 to 17 houses.

Olmsted County had an estimated 65,380 total housing units in 2019 with 3,272 vacant housing units. Overall, Kalmar Township has one vacant house for every 34 houses, and Olmsted County has one vacant house for every 20 houses. The housing characteristics are detailed in Table 17.

Table 17: Housing Characteristics

County/Township/City	Category ¹		
	Total Housing Units	Occupied	Vacant
Dodge County	8,241	7,756	485
Mantorville Township	671	632	39
Canisteo Township	251	235	16
Olmsted County	65,380	62,108	3,272
Kalmar Township	442	429	13

¹ Data retrieved from the 2019: ACS 5-Year Estimates Subject Table, Selected Housing Characteristics, Table ID: DP04.

Income and Poverty

As shown in Table 18, the estimated per capita income for Dodge County was \$34,399 in 2019. Mantorville Township had the highest estimated per capita income of \$52,061, followed by Canisteo Township with an estimated per capita income of \$45,354. While Mantorville Township has a higher per capita income level than Canisteo Township, they have the same percentage of people living below the poverty level.

The estimated per capita income for Olmsted County was \$41,066 in 2019. Kalmar Township had a slightly higher estimated per capita income of \$53,680 compared to nearby Mantorville Township at \$52,061. While Kalmar Township has a higher per capita income level, it has a higher unemployment rate and percentage of people living in poverty than Mantorville Township.

The primary industries in Dodge County are classified as Educational Services, and Health Care and Social Assistance (32.7 percent), Manufacturing (13.5 percent), and Retail Trade (9.5 percent). The primary industries in Olmsted County are classified as Educational Services, and Health Care and Social Assistance (45.7 percent), Retail Trade (9.9 percent), and Manufacturing (7.6 percent). It should be noted that the current situation with Covid-19 has likely affected current demographic statistics of the Project Area related to population, primary occupations, and income and unemployment rates.

Overall, the townships have higher per capita income and lower percentages of people living in poverty than the counties. Additionally, Kalmar Township has the highest per capita income and the highest unemployment rate compared to other townships and the counties.

Table 18: Income and Poverty

County/Township/City	Category ¹		
	Per Capita Income	Unemployment Rate (civilian over 16 years)	People Living Below Poverty Level
Dodge County	\$34,399	2.6%	5.1%
Mantorville Township	\$52,061	3.1%	1.2%
Canisteo Township	\$45,354	2.4%	1.2%
Olmsted County	\$41,066	3.0%	8.4%
Kalmar Township	\$53,680	5.6%	5.1%

¹ Data retrieved from the 2019: ACS 5-Year Estimates Subject Table, Selected Economic Characteristics, Table ID: DP03.

The Applicant evaluated the Minnesota Areas of Environmental Justice Concern interactive map created by the Minnesota Pollution Control Agency (MPCA, 2021c) which identifies areas of environmental justice concern in Minnesota. The MPCA uses U.S. Census tract data in preparing the mapping. A census tract is considered to be an area of concern if it meets one or both of the following: the number of people of color is greater than 50 percent, or more than 40 percent of the households have a household income of less than 185 percent of the federal poverty level. Additionally, communities within Tribal boundaries are also considered areas of concern for Environmental Justice. See Section 6.5 for information on Tribal Resources.

In Kalmar Township (census tract 18), about 11 percent of residents reported income less than 185 percent of the poverty level. In Mantorville Township (census tract 9504), about 16.7 percent of residents reported income less than 185 percent of the poverty level. The only area within Dodge and Olmsted counties that meets the area of concern for environmental justice is the City of Rochester, about 8 miles east of the Project Substation. No portion of the Project is located within a Tribal boundary.

Impacts and Mitigation

No measures to mitigate socioeconomic impacts are proposed because the Project is anticipated to achieve a positive socioeconomic benefit. Owners of land where the Project will be constructed have entered into lease, purchase, or easement agreements with the Applicant and are compensated for the use of the land based upon these agreements.

The Project is designed to be socioeconomically beneficial to participating landowners, local governments, and communities. Landowner compensation is established by voluntary lease, purchase, or easement agreements between the landowners and the Applicant's lease or purchase of the land.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for lodging, food services, fuel, transportation, and general supplies. The Project will also create new local job opportunities for various trade professionals that live and work in the area, and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work.

Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

General skilled labor is expected to be available in Dodge and Olmsted counties or Minnesota to serve the Project's basic infrastructure and site development needs. While an estimate of construction employment by job classes is not available at this time, the Economic Impact Study in Appendix N provides a breakdown of anticipated jobs in Dodge County and for the State of Minnesota. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states. The relatively short construction duration often precludes special training of local or regional labor, and much of the workforce needed to construct a solar facility must be comprised of Minnesota licensed electricians. Most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code. The Applicant will issue an RFP to BOP contractors to construct the Project. The Applicant will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The BOP contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget.

Effects on temporary or permanent housing are anticipated to be negligible. During construction, out-of-town laborers will likely use lodging facilities nearby. In the nearest metropolitan area, Rochester, Minnesota, there are approximately 2,161 vacant housing units (U.S. Census Bureau, 2021). The operations and maintenance of the Solar Facility will require approximately 4 full-time, permanent personnel. The Applicant anticipates that sufficient temporary lodging and permanent housing will be available within Dodge and Olmsted counties to accommodate construction laborers and long-term personnel.

In general, the socioeconomic impacts associated with the Project will be positive; therefore, no mitigation measures are proposed. Wages will be paid, and expenditures will be made to local businesses and landowners during the Project's construction and operation. The Project will provide production tax payments to Dodge and Olmsted counties of approximately \$400,000-\$450,000 annually over 35 years or longer. Additionally, the townships will receive approximately \$100,000-\$125,000 annually over 35 years. In addition, lease and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production.

6.2.8 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community. According to the U.S. Census Bureau, the population of Dodge County derives from a mostly European heritage accounting for approximately 94% of the population, followed by 5% Hispanic, and the remaining approximately 1% comprised of African American, Native American, and Asian American (U.S. Census Bureau, 2019). The region surrounding the Project has cultural values tied to the area's German, English, and Native American heritage, the agricultural economy, and recreational activities such as hunting and fishing. Cultural representation in community events appears to be tied to geographic features (such as nearby lakes), seasonal events, national holidays, and municipal events as well as ethnic heritage.

Farm-related businesses play an important role in the regional economy, and the area has a diversified agricultural mix of crops and livestock production. In general, agricultural communities in southeastern Minnesota, and in the Project Study Area, are characterized by relatively flat and wide-open vistas with scattered farmsteads and associated shelterbelts dotted throughout the landscape.

As described further in Section 6.3.3, cultural representation for both European and Native American groups in community events includes annual events like the Dodge County Free Fair, the oldest running County Fair in the state of Minnesota.

Other community events near the Project are centered more around seasonal events, national holidays, and municipal events than to those based in ethnic heritage. Examples of regional cultural events include Marigold Days in Historic Mantorville (Mantorville, 2021). Marigold Days includes flower shows, car shows, bingo, live music, street dances, baseball tournaments, antiques and a flea market, and a Grande parade. A more detailed discussion of these events is presented in Section 6.3.3.

Impacts and Mitigation

The presence of the Project will not permanently impact the general character, aesthetics, or the cultural values of the Project Area. As demonstrated by other transmission line projects in the Midwest, agricultural practices continue throughout construction and operation. See Section 6.3.1 for a more detailed discussion of how the Project is expected to affect agricultural practices in the Project Area. No impacts on light industrial uses in the Project Area are anticipated from construction or operation of the Project.

The Project will not impact access to public hunting or fishing areas, so no impact to recreational fishing or hunting is anticipated.

Because no impacts on cultural values are anticipated, no mitigative measures specific to cultural values are proposed.

6.2.9 Recreation

There are various recreational opportunities in or near the Project Area. Information from the MNDNR, Dodge County and other federal GIS databases were reviewed to identify recreational resources within and near the Project.

According to the MNDNR's Interactive Snowmobile Trails Map, Trail 302, managed by Kasson-Mantorville Trails, crosses the proposed site (MNDNR, 2021d). The Applicant contacted Mr. Corey Hower of Kasson-Mantorville Trails on May 21, 2021 to discuss the Project and possibly rerouting the snowmobile trail. Mr. Hower stated he was open to rerouting the trail and requested Project maps with the current and proposed trail alignments. On May 26, 2021, the Applicant provided maps to Mr. Hower showing the current trail and proposed trail alignments. On June 10, 2021, Mr. Hower stated the club agreed with the proposed route and requested to be notified if any additional changes to the route would be needed and when the reroute would go into effect. The Applicant will continue coordinating with Mr. Hower and Kasson-Mantorville Trails. Map 9 depicts the existing and proposed snowmobile trail. There are no other designated public (federal, state, or local) recreational lands within the Project Area boundaries.

According to the MNDNR Recreational Compass, there are no state forests, national forests, national wildlife refuges, lakes with public access, state water trails, Aquatic Management Areas, state parks, or migratory waterfowl feeding and resting areas in within close proximity to the Project boundaries (MNDNR, 2021e). Additionally, there are no state-owned Off-Highway Vehicle (OHV) trails (MNDNR, 2014) and no MNDNR SNAs identified within 1 mile of the Solar Facility boundary or the HVTL right-of-way (MNDNR, 2021f).

Recreational opportunities at public lands include MNDNR WMAs, snowmobile trails, and county and city parks (refer to Map 9). Each of these public lands offers recreational opportunities that attract residents and tourists.

There are additional recreational opportunities within the nearby City of Kasson such as the Dodge County Fairgrounds, Dodge County Speedway, the Kasson Aquatic Center, parks, trails, and more. See the Tourism section in 6.3.3 for more information on these potential recreational activities that are not on public lands.

Primary recreational resources identified within roughly 5 miles of the Solar Facility site boundary area shown in Table 19 and Map 9.

Table 19: Recreational Resources

Resource	Approximate Distance to Solar Facility Boundary
Snowmobile Trail 302	Located in Solar Facility
16 th St NE Trail	1.2 miles north
Tri-cooperative WMA	1.5 miles south
5 th Ave NE Trail	1.5 miles northwest
Lions Park	1.6 miles northwest
Sunrise Trail	1.7 miles north
Sunset Trail	2.0 miles northwest
South Fork Zumbro River WMA	4.0 miles south
Pheasants Forever WMA	4.3 miles northwest
Bud Jensen WMA	4.4 miles southwest
Vernon WMA	4.9 miles south

Snowmobile Trail 302

Snowmobile Trail 302 is a grant-in-aid trail that receives state funding for maintenance. Snowmobile trails are mapped by MNDNR and managed locally by each county and their respective snowmobile clubs. Dodge County is the sponsor of the trail, which is actively managed by Kasson-Mantorville Trails. The local snowmobile clubs receive verbal permission from private landowners to use their lands for trail access. The trail as positioned travels through the central portion of the Solar Facility in a north to south direction between Kasson and Hayfield. The Applicant has begun coordinating with the local trail contact to re-route the trail around the proposed Solar Facility boundary,

Trails

The Dodge County Trails Association (DCTA) has worked to provide new trails for the County (Dodge County, 2019). The DCTA, in conjunction with the County Highway Department, are responsible for the upkeep of trails like the Sunset and Sunrise Trails (Dodge County, 2019). DCTA and the County Highway Department also maintains the 16th Street NE and 5th Ave NE trails near the City of Kasson. There are no biking or walking trails within the Project site.

Wildlife Management Areas

The nearest MNDNR WMA is the Tri-cooperative WMA, located 1.5 miles south of the Project Area.

Scenic and Natural Areas

There are no SNAs within one mile of the Project Area. The nearest SNA is the Iron Horse Prairie SNA, located 10.3 miles southwest of the Project Area.

Local and State Parks

No county or city parks are located in the Project Area or within one mile of Project facilities. Lions Park in the City of Kasson is the nearest park to the Project Area, located approximately 1.6 miles to the northwest. The park is owned by the City of Kasson and public use of the park is focused on playgrounds, open space fields, and a skate park. The City of Kasson also owns and operates East Diamond Park, Prairie View Park, Meadowland Park, J Hyde Park, and Veterans Memorial Park (Dodge County, 2019). Dodge County does not have extensive parkland outside of City-owned parks. The nearest state park is Rice Lake State Park, located sixteen miles to the northwest in Dodge County (MNDNR, 2021e).

Impacts and Mitigation

Solar Facility

Construction and operation of the Solar Facility is not anticipated to impact recreational opportunities. Use of Snowmobile Trail 302 could be temporarily interrupted during rerouting activities and during construction of the Solar Facility. Should construction occur during winter months, signage will be installed to redirect trail users to the new route. There will be no impacts during operation of the Solar Facility. The Applicant will continue to coordinate with the landowners, Dodge County, and the Kasson-Mantorville Trails club during rerouting and construction activities. The panels and transmission line will also be visible from the snowmobile trail corridor but are not anticipated to negatively impact the overall experience of the users.

HVTL

The HVTL does not cross any recreational facilities; therefore, no impacts on public use of recreational facilities are anticipated.

Impacts to nearby recreation areas would mostly be related to HVTL construction, and will be minimal, temporary, and isolated to specific areas throughout the HVTL right-of-way. Short-term increases in noise and dust would occur during construction of the Project and could detract from public enjoyment of nearby recreational activities. However, these impacts would

be minimal, and use of BMPs to limit noise and fugitive dust during construction would effectively mitigate their effects. Section 6.2.4 discusses how the Applicant would mitigate potential noise impacts and Section 6.6.1 provides a discussion of how the Applicant would mitigate fugitive dust emissions during construction of the Project.

Introduction of an aesthetic change to the predominantly agrarian landscape in the Project Area could impact public enjoyment of nearby recreation opportunities. The Applicant has minimized impacts to recreational opportunities by siting the Proposed Route to avoid these areas. A detailed discussion of how the Project could impact aesthetics and the measures the Applicant would use to mitigate aesthetic impacts is provided in Section 6.2.6.

6.2.10 Public Services and Infrastructure

Public services are those typically provided by a government entity to its citizens and those services are used to benefit public health and safety. These services can include emergency services such as police, fire, ambulance services, and hospitals. Infrastructure such as the existing locations of drinking water and wastewater systems, utilities, and roadways are factors to be considered when siting a Solar Facility and HVTL. In addition, the influx of large numbers of non-local personnel to an area has the potential to increase enrollment in local school districts, if the non-local personnel are accompanied by their families.

6.2.10.1 Police, Fire, and Ambulance Services

Public emergency services within the Project Area are provided by local law enforcement and emergency response agencies located in nearby communities. The sheriff's offices of Dodge and Olmsted counties provide law enforcement to communities in the Project Area; however, the cities of Kasson, Dodge Center, and Rochester have local police departments. Fire services near the Project Area are provided by city and community fire departments, including Byron, Kasson, Dodge Center, and Rochester.

Ambulance response is provided by local ambulance services out of Dodge Center, Hayfield, and West Concord.

6.2.10.2 Hospitals

Hospitals near the Project Study Area include the Mayo Clinic Hospital (Rochester, Olmsted County) and Owatonna Hospital (Owatonna, Steele County). Smaller medical clinics or medical centers in the area include the Kasson Mayo Family Practice in Kasson, the Olmsted Medical Center in Byron, and various eye clinics, dental offices, mental health offices, and chiropractors.

6.2.10.3 Water and Wastewater Services

Most rural residences in Dodge and Olmsted counties are supplied water by wells (see Section 6.6.3). The City of Kasson and City of Byron provide municipal water and sewer services to each respective municipality. The majority of residences in rural areas throughout the Project Area have private septic systems and/or drain fields.

6.2.10.4 Utilities

There are numerous utility services and providers in Dodge and Olmsted counties. Telephone services are primarily provided by Frontier Communications, and cable/internet by Mediacom (DEED 2021).

The HVTL is located adjacent to the existing SMMPA's Byron Substation. Several electrical distribution lines would cross the HVTL right-of-way. The HVTL right-of-way crosses the Byron to North Rochester high voltage transmission line (345 kV) en route to the Byron Substation. The HVTL right-of-way also runs parallel to and crosses the AI Corn (GRE) to Byron 161 kV transmission line and the Byron to Kasson 69 kV transmission line en route to the Byron Substation. Approximate locations of the transmission lines and other nearby lines are displayed on Map 8. No natural gas or hazardous liquid pipelines were identified in the Project Area (PHMSA, 2021).

No AM, FM, microwave, television, or other radio towers were identified in the Project site according to publicly available FCC sources. One cell phone communications tower was identified in close proximity to the Project site in the northwestern portion of the Project Area. No other towers were identified within 1 mile of the Project Area boundary. A discussion of potential Project effects on radio, television, cellular phone, and GPS is provided in Section 6.2.5.

Peoples Cooperative Service is the primary electrical provider for the Project Area (MnGeo, 2021). The city of Kasson service area includes the city of Kasson and minor areas outside the municipal boundary. Xcel Energy and Rochester Public Utilities service areas are adjacent to the Peoples Cooperative Service electrical service boundaries. Minnesota Energy Resources provides natural gas service in the Project Area (Minnesota Energy Resources, 2021).

Impacts and Mitigation

No impacts to emergency services are anticipated as a result of the Project. Any temporary road closures required during construction would be coordinated with local jurisdictions to provide safe access of police, fire, and other rescue vehicles. Local law enforcement resources may be utilized for traffic control and law enforcement during construction activities. In the event that emergency services are needed for local residents during the approximate 12-18 months of active construction, construction will stop, and any impeding equipment will be relocated so that emergency vehicles may access the emergency site. Any accidents that might occur during construction of the Project would be handled through local emergency services. The influx of approximately 293 workers to construct the Project would not be expected to influence emergency or public health services. Once construction is complete, the Project will not impede emergency services. As such, construction and operation of the Project is anticipated to have minimal impacts on the emergency services.

The Applicant will coordinate with Gopher State One Call before and during construction to fully understand infrastructure, utility locations and safety concerns and to avoid possible structural conflicts. The Applicant will also conduct an American Land Title Association survey to identify the locations of underground utilities. Final design will minimize and avoid impacts to underground and overhead utilities; if conflicts are unavoidable the Applicant will coordinate with the utility to develop an approach to reroute or otherwise protect the utility. Underground utilities will be marked prior to construction start.

The Solar Facility will interconnect into the existing Byron Substation via a 3-mile 345 kV Transmission Line. During interconnection, local electric utility customers may experience short outages when the Byron Substation is shut down and temporary service is being established. The timing and duration of any service interruptions would be determined and communicated by the interconnecting utility (SMMPA). Limited, temporary impacts to service may occur during interconnection of the Project Substation via the short 345 kV transmission line to the Byron Substation, but these outages are anticipated to be of short duration and closely coordinated with utilities and landowners.

The proposed route does not cross any pipelines. Should any crossings be proposed, encroachment agreements will be executed, and utility locations will be marked prior to construction to avoid impacts from construction and operation activities.

The existing transmission line in the Project Area will be located above proposed solar infrastructure and no impacts to existing poles are anticipated. The Proposed Route will run parallel to the two existing transmission lines near the Byron Substation, and will cross the transmission lines northwest of the intersection of County Road 34 and County Road 15. Limited, temporary impacts to service may be unavoidable during construction of the Route; however, these are expected to be short in nature. Coordination with local individuals and utilities impacted by temporary shutdowns will be initiated prior to any shutdowns. Because no permanent impacts to public services are anticipated, no permanent mitigation measures are proposed.

6.2.11 Zoning and Land Use

The Solar Facility is sited within Canisteo and Mantorville Townships in Dodge County, and the HVTL is located within Mantorville Township in Dodge County and Kalmar Township in Olmsted County. Because the Site and Route Permits supersede local permits, no zoning or land use permits are required for construction of the Project from Dodge or Olmsted counties, or associated townships. See Section 1.4 regarding the Site Permit and preemption of local permits and zoning. A Site Permit and Route Permit supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances put in place by regional, county, local and special purpose governments, although the review by the Commission will take local land use into consideration.

Zoning

Dodge County

Map 14 shows the proposed Solar Facility and HVTL are located in the Agricultural Zoning District in Dodge County (Dodge County, 2018). Dodge County Zoning Ordinance Sections 8.4.18 and 16.46 states that solar farms (exceeding 40 kW nameplate capacity) are permissible in the Agricultural district upon approval of a conditional use permit (CUP). Dodge County Zoning Ordinance Section 8.4.5 states that a Major Essential Service - Transmission (exceeding 34.5 kV) must acquire a CUP prior to construction. Per the Dodge County Ordinance, the Project uses are compatible with local land use regulations for solar energy facilities and transmission lines. The County has determined that these types of land uses are acceptable in the Agricultural Zoning District upon approval of a CUP (Dodge County, 1995). The Applicant is coordinating with local and county officials regarding the Project. See Section 1.4 for additional information on required local permits and Section 5.2.1 regarding county setbacks.

The Agricultural zoning district goals are to retain, conserve, and enhance agricultural land in Dodge County and to protect this land from scattered residential development (Dodge County, 2019). As these lands will ultimately be returned to agricultural uses upon decommissioning the Project, and agricultural lands will be allowed to “rest” during the Project’s life-cycle, the Project will further the county’s goals of providing long-term agricultural opportunities. In addition, the Applicant, in coordination with Dodge County, excluded lands in the City of Kasson’s Urban Expansion District as shown on Exhibit D-2 of the Dodge County Zoning Ordinance.

The Dodge County Zoning Ordinance applies to solar energy systems that are not otherwise subject to siting and oversight by the State of Minnesota under the Minnesota PPSA (Minn. Stat. § 216E). The Minnesota PPSA (Minn. Stat. § 216E.10, subd. 1), states that the Site Permit and Route Permit are the only site approvals required for construction of the Project. See Section 1.4 for details the preemption of local permits.

Olmsted County

Map 14 shows the proposed HVTL is located in the A-2 Agricultural Zoning District in Olmsted County (Olmsted County, 2021a). The Applicant reviewed county zoning information for Olmsted County to identify any additional routing constraints for the proposed transmission line. As noted in Section 5.1.4, NESC standards require certain clearances between transmission line facilities and buildings for safe operation of the transmission line. Areas zoned as commercial, industrial, or residential are the most likely areas where future development of residences and other structures may occur. As demonstrated with the land use data, and generally in the human settlement section, much of the Project Area is rural and zoned entirely for agricultural land uses (A-2).

According to the Olmsted County Zoning Ordinance, the HVTL is considered part of the solar energy farm as defined in Section 2.02, which states a solar energy farm is “a group of interconnected solar collection systems connected to a public or private utility system through a system of transformers, distribution lines, which may include a substation. Operation, control, and maintenance functions are often centralized through a network of computerized monitoring systems, supplemented by visual inspection.” Additionally, a solar collection system has the primary purpose of providing the collection, inversion, storage, and distribution of solar energy for electricity generation. Section 10.52 (Solar Energy Farms) of the Ordinance outlines the location and site design requirements, and conditional use review criteria (Olmsted County, 2017). Olmsted County Zoning Ordinance Section 5.02 states that a CUP is required for solar energy farms located in the A-2 Agricultural Protection District. Although the Olmsted County Zoning Ordinance does not apply because the HVTL requires a Route Permit, which supersedes and preempts all zoning ordinances authorized by the County, the Applicant will continue to apply county standards, where feasible, and coordinate with local and county officials regarding the Project.

The Proposed Route has been sited on predominantly agricultural land, along existing roadways, and property lines, and avoids residential areas. These areas correspond to the Agricultural District.

Land Use

The Project is located within a rural landscape, and the primary land use in the Project Area is agricultural (96.9 percent) followed by herbaceous/hay/pasture (1.6 percent), developed lands (1.5 percent), and the remaining identified land uses include a minor amount of deciduous forest (0.1 percent) (USGS, 2016).

Table 20 summarizes the land use types within the Project. Most of the agricultural land in the Project Area is subject to row-crop agriculture, such as corn and soybeans. Developed land within the Project Area generally consists of public roads, namely U.S. Highway 14, County Road 15, County Road 6, 280th Street, 650th Street, 655th Street, and 262nd Avenue. The small area (28.8 acres) of herbaceous/hay/pasture lands within the Project Area is associated with roadside ditches and unnamed streams. The minor amount of deciduous forest identified in the Project Area is associated with the rural homestead and agricultural buildings in the southeastern portion of the Project Area (Map 10).

Table 20: Land Use Within the Project Area (in acres)

Land Use Type	Acres in Project Area	Percent of Total Acreage
Agricultural	1,795.6	96.9
Herbaceous/Hay/Pasture	28.8	1.6
Developed	27.3	1.5
Deciduous Forest	1.9	0.1
Total	1,853.7	100.0%

Farmsteads are sparsely scattered outside of the Project Area, generally situated near public roads. Based on review of available aerial photography, there are 17 residences (1-17 located on parcels adjacent to the Project Area as highlighted on Map 3).

A detailed discussion of potential wetland impacts is presented in Section 6.6.5 and a discussion of potential Project impacts on herbaceous vegetation is presented in Section 6.6.6. Table 20 presents details about the amount of each NLCD land cover type included in the Solar Facility and Proposed Route (Map 10).

Typical crops grown in the Project Area include corn, soybeans, forage (hay and green chop), sweet corn, and vegetables harvested for sale (USDA, 2017a and USDA, 2017b). A more detailed discussion of the existing agricultural economy in the Project Area is presented in Section 6.3.1, and a discussion of vegetation types within the non-agricultural areas is provided in Section 6.6.6.

Dodge County

The Project has been designed in compliance with the goals and policies of the Dodge County Comprehensive Plan (2019), specifically protecting the environment, preserving agricultural land, promoting compatible development and uses to prevent land use conflicts, and protecting groundwater as described throughout this Application. The goals and policies of the Dodge County Comprehensive Plan are exercised through the County's zoning power, and as previously outlined, the Project meets the Agricultural zoning district goals to retain, conserve, and enhance agricultural land in Dodge County and to protect this land from scattered residential development (Dodge County, 2019).

Olmsted County

The Project has been designed in compliance with the goals and policies of the Olmsted County General Land Use Plan. The Olmsted County land use plan map shows the Proposed Route is located entirely within the Urban Service Area (Olmsted County, 2021a). According to the

Olmsted County General Land Use Plan, Chapter 4, the Urban Service Area consists of municipalities and additional developed and undeveloped land around each municipality needed to accommodate development over the next 25 to 50 years. The intent of the Urban Service Area designation is to (1) delineate the best areas for urban growth until the year 2040, (2) accommodate uses and development patterns compatible with future urban growth, and (3) allow for the continuation of agricultural and other resource uses (Olmsted County Planning Advisory Commission, 2014). The Proposed Route is compatible with the General Land Use Plan and is consistent with the Urban Service Area land use and development policies of compatibility with adjacent land uses (transmission lines already surround the Byron Substation), and the continuation of agricultural activities within the HVTL right-of-way.

While the Olmsted County General Land Use Plan does not address transmission lines in the Urban Service Area, it does include a policy for siting transmission lines in Resource Protection areas. The policy states that the location of high voltage transmission lines “should be controlled to the extent allowable to minimize potential aesthetic and other public health or welfare impacts including property impacts.” The HVTL has been routed to be co-located with existing transmission and railroad rights-of-way for about 1 mile of its length to minimize aesthetic impacts to non-developed areas.

Impacts and Mitigation

Solar Facility

The Solar Facility will change the land use from agricultural to solar energy use within the anticipated Development Area (Map 2). The conversion of agricultural land to the Solar Facility will have a relatively minimal impact on the rural character of the surrounding area or Dodge County. As discussed further in Section 6.3, Land-based Economies, of the 281,600 acres in Dodge County the majority is classified as agricultural land. Impacts to approximately 1,529.7 acres of agricultural land within the Solar Facility footprint would reduce the amount of agricultural land in the county by less than one percent (0.6 percent). The Project Substation and O&M Facility will affect approximately 9.4 acres of cultivated cropland.

Expected land use impacts within the Solar Facility anticipated Development Area and HVTL right-of-way are provided in Table 21.

Table 21: Expected Land Use Impacts

Land Use Type	Acres in Solar Facility Development Area	Acres in Proposed Route Right-of-Way¹
Agricultural	1,529.7	49.2
Herbaceous/Hay/Pasture	14.2	0.5
Developed	8.7	3.0
Total	1,552.6	52.7

¹ The Proposed Route includes the 150 right-of-way (75 feet on both sides of the transmission line centerline) for a total of 52.7 acres. Construction is anticipated to impact only 25 feet on both sides of the transmission line centerline for a total of 17.4 acres. The remaining 35.3 acres allows for design flexibility, provides space to maneuver construction vehicles, provides for Minimum Vegetation Clearance Distances per NERC Reliability Standards, and provides a buffer for line sway on windy days.

Note: The total shown in this table may not equal the sum of addends due to rounding.

Even though the Project proposes impacting a relatively small percentage of available farmland in Dodge and Olmsted counties, the Applicant has coordinated with the Minnesota Department of Agriculture (MDA) on an AIMP (Appendix D). This AIMP has been designed to incorporate BMPs into siting procedures; pre-construction, construction, and post construction methods; operational procedures; and decommissioning and restoration procedures to avoid and minimize impacts to soil and site productivity such that pre-construction agricultural productivity (anticipated use, appropriate management) is rapidly returned to the site following decommissioning. The Applicant circulated the draft AIMP to MDA staff on June 18, 2021 (see Table 32).

Normal agricultural activities can continue within portions of the Project not converted to solar panels, access roads, and fencing. After the useful life of the Solar Facility, the current agricultural land use could be restored by removing the Project components as outlined in Section 5.4.

While there is no land in the Solar Facility site currently used as residential or commercial, land use may also be converted to these uses after the useful life of the Solar Facility. The Solar Facility is not anticipated to preclude current or planned land use on adjacent parcels; and upon decommissioning and removal of the Project, the affected parcels may be returned to the existing agricultural use or potentially transitioned to other planned land uses.

As noted in Section 5.1.3, the Project Substation footprint will measure approximately 160 feet by 175 feet on a 6.8-acre gravel pad. As noted in Section 5.1.6, the O&M Facility building footprint will measure approximately 70 feet by 35 feet on a 2.6-acre gravel pad. The remaining areas within the gravel pads will be used to accommodate the fence setback, employee parking, and equipment storage and maintenance. The Applicant completed wetland delineations in Spring 2021 to confirm the 6.8-acre Project Substation will occur in cultivated crops and uplands; the Project Substation is not anticipated to impact wetlands or require wetland fill. For the purposes of this Application, the Applicant conservatively assumed permanent impacts to the entire 6.8-acre construction workspace. The Project Substation components will be mounted on concrete pads on a graveled surface to maintain the area free of vegetation, and a fence will be installed to prevent unauthorized entry by individuals and wildlife.

Components of the Solar Facility will not be located in the City of Kasson's Urban Expansion District, as shown on Exhibit D-2 of the Dodge County Zoning Ordinance. Construction of the Solar Facility would not preclude the future orderly extension of these services across property under the Applicant's control as these extensions would likely be accomplished by utilizing existing public rights-of-way, which will not be impacted by the Project.

Because no permanent land use or zoning impacts are anticipated, no additional mitigation measures are proposed beyond those described in the prepared AIMP.

HVTL

As noted in Table 21, approximately 49.2 acres of cultivated cropland is crossed by the HVTL right-of-way. Of the remaining 3.5 acres, 3.0 acres are developed land and 0.5 acre are herbaceous/hay/pasture lands.

Construction and operation of the HVTL is not expected to have a significant impact on land use within Olmsted County. Existing land uses along the Proposed Route will experience minimal, short-term impacts during the period of construction. The Applicant sited the HVTL to be co-located with existing transmission and railroad rights-of-way for about 1 mile of its length to

minimize impacts to non-developed areas. When Transmission Line construction is complete, the Applicant will restore the workspaces as described in Section 4.3, and land uses will be allowed to continue as before. No additional mitigation measures are proposed. For a more detailed discussion of impacts and mitigation measures that will be employed in agricultural land, refer to Section 6.3.1.

The Proposed Route crosses areas zoned as agricultural in Dodge and Olmsted counties. Additionally, as shown on Exhibit D-2 in the Dodge County Zoning Ordinance, the HVTL right-of-way is located about 0.25 mile east of the City of Kasson's Urban Expansion District (Dodge County, 2019). The Project does not propose infrastructure or other construction activities in the Urban Expansion District, and no areas zoned as residential, commercial, or industrial are crossed by the Proposed Route; therefore, no mitigation measures are proposed.

6.2.12 Transportation

6.2.12.1 Roadways

Access to the Project will be via existing township, county, or state roads. With the limited possible exception of minor field access or driveway changes, which may be needed depending on final design, no changes to existing roadways are planned. The major roadway in the area is U.S. Highway 14, which bisects the Project and borders the northern perimeter of the Solar Facility. Other roads surrounding the Project are county and township roads. The Annual Average Daily Traffic (AADT) counts based on MnDOT's Traffic Mapping Application (MnDOT, 2021a) are provided in Table 22 and displayed on Map 8.

Table 22: Annual Average Daily Traffic in the Project Vicinity

Roadway	Year	AADT Traffic Volume Total
Solar Facility		
U.S. Highway 14 (between Kasson and Byron)	2019	20,500
County Road 15 (270 th Ave; bisects Solar Facility)	2017	820
650 th Street	2017	90
County Road 6 (670 th Street; borders southern boundary of Solar Facility)	2017	135
County Road 13 (250 th Ave; 0.5 mile west of Solar Facility)	2017	1,200
HVTL		
280 th Avenue (north of County Road 34)	2018	1,550
County Road 34 (Olmsted County)	2018	1,900
County Road 34 (Dodge County)	2017	1,650
County Road 15 (north of County Road 34)	2017	1,050

With the exception of U.S. Highway 14, traffic volumes are relatively low on most roads crossed by the Solar Facility and HVTL, as expected given the rural nature of the area (refer to Table 21). AADT rates are highest near the Project Substation on U.S. Highway 14 (20,500) followed by county roads and township roads (ranging from 90-1,900).

There will be several access points to the Project. The northern and central units of the Solar Facility will be accessed from County Road 15 (270th Street) and 650th Street. Other proposed access points for the central units will also use 655th Street and 262nd Avenue. Access to the southern units will be from 280th Avenue. Access from U.S. Highway 14 is not currently being contemplated for the Project. The Applicant may utilize the existing driveway at the intersection of 265th Avenue and 640th Street (from U.S. Highway 14) for access to the Project Substation.

The HVTL right-of-way will be accessed from County Road 15 (270th Avenue), County Road 34, and 280th Avenue.

Impacts and Mitigation

Solar Facility

Access to the Project will be via existing state, county, and township roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. The roads used for access to the Solar Facility are shown on Map 8.

The Applicant will secure necessary local permits for road access and other ancillary aspects of the Project and will work with the county engineer and MnDOT in regard to planned work within road rights-of-way to support project utility installation. During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of Project, primarily through additional traffic and the potential for slow-moving construction vehicles.

Construction traffic will use the existing state and county roadway system to access the Project facilities and deliver construction materials and personnel. Traffic during the 12-18 months of active construction is estimated to be approximately on average 50-100 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction. However, the number of vehicles traveling to and from the site each day will depend largely on the activities being performed and is anticipated to fluctuate throughout the construction timeline. It is estimated that approximately 10-20 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day (AADT). Since the area roadways have AADTs that are well below capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period. Overweight or oversized loads will be limited to transporting the main power transformers. The Applicant will obtain the appropriate approvals prior to construction.

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

HVTL

Temporary road or lane closures may occur during the construction process to ensure safety of the construction crews and the traveling public. While the line is being constructed, the electrical conductors will be strung on support structures using a pulley system or a tensioner. At road crossings, roads or lands may be temporarily closed for safety purposes when stringing electrical conductors between support structures. These closures could range in duration from minutes to hours based on the width of the road and the complexity of the crossing. Temporary closings are not expected to have significant impacts on transportation in the area because of the generally rural nature of the area and subsequent low traffic levels on most roads. Crossings would be scheduled during low traffic volume periods to reduce potential delays and impacts to the transportation system. Once an aerial crossing is completed, the road(s) will be reopened to allow normal traffic flow.

The Proposed Route crosses U.S. Highway 14 just west of the intersection of U.S. Highway 14 and County Road 15 (270th Ave), east of Kasson. Any occupation of state highway right-of-way requires a Utility Permit from the MnDOT, per Minn. R. 8810.3100 to 8810.3600. MnDOT's Accommodation Policy provides requirements and guidelines for the installation of utility facilities in and along MnDOT rights-of-way, which the HVTL was developed to meet. The Applicant has begun coordinating with MnDOT and will continue to work with MnDOT throughout the Route Permit process to ensure that the Proposed Route meets MnDOT permit requirements.

After the completion of construction, Byron will ensure that township, city, and county roads used for purposes of access during construction are returned to their condition before right-of-way clearing began. The Applicant will meet with township road supervisors, city road personnel, or county highway departments to address any issues that arise during construction to ensure the roads are adequately restored, if necessary, after construction is complete.

6.2.12.2 Railroads

There are no railroads that cross the Solar Facility, so rail traffic will not be affected by the construction of solar infrastructure.

The Proposed Route crosses the Canadian Pacific Railway just west of the intersection of County Road 34 and County Road 15, east of Kasson. The HVTL route parallels the railroad for about 1 mile near 270th Avenue. Along this segment, the HVTL right-of-way is about 85 feet north of the railroad tracks. The HVTL will be constructed in such a way that it will not affect normal railroad operations. The Proposed Route does not cross any additional railroads.

Impacts and Mitigation

Impacts to the Canadian Pacific Railway are not anticipated as a result of construction and operation of the Project. Byron will obtain all necessary railroad crossing permits from Canadian Pacific for their rail line. Byron will also coordinate with the appropriate railroad personnel during construction to schedule electrical conductor stringing over the rail line for the safety of construction personnel and rail line operations.

6.2.12.3 Airports and Airstrips

According to the Federal Aviation Administration (FAA), there are no operating public-use airports or heliports in the Project Study Area. The nearest FAA-registered airport is Dodge

Center Municipal Airport located 5.2 miles west of the Solar Facility in Dodge Center, Minnesota. This airport operates one paved runway and one turf runway.

Impacts and Mitigation

The FAA and the Minnesota Department of Transportation (MnDOT) have both established guidelines for development of transmission lines near public airports. The FAA has developed height restrictions for development near public airports and has developed guidelines for placement of buildings and other structures near high frequency omnidirectional range navigation systems. MnDOT has established zoning areas around public airports that restrict the area where buildings and other structures can be placed. Both the FAA and MnDOT guidelines apply only to public airports and are not applicable to private airstrips.

On April 8, 2021, the Applicant used the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) Notice Criteria Tool to determine if further aeronautical study or FAA filing is needed (FAA, 2021). Structures ranging in height from 20 to 151 feet were filed. The response from the FAA's screening tool indicates that at least one of the proposed structures is in proximity to a navigation facility and may impact the assurance of navigation signal reception. The Applicant is committed to working with FAA staff regarding the issue and intends to file additional documentation in accordance with CFR Title 14 and Notice Criteria Tool recommendations.

6.3 Land-Based Economies

The placement of solar facilities and transmission line structures in cultivated cropland has the potential to interfere with farming operations and remove some land from agricultural production. Interference with farming operations can negatively affect farm income. Additionally, trees and structures are not allowed within transmission line rights-of-way due to safety concerns, a restriction that could affect forestry businesses along the right-of-way if present. Impacts to tourism could result from an aesthetic change to the predominantly agrarian landscape and interruption of public access to nearby recreational and tourism opportunities. Placement of solar facilities and transmission line towers near mining operations could interfere with access to existing mines and could limit the expansion of the mines. The following subsections present an overview of agricultural, forestry, tourism, and mining operations in the Project Area and discusses how the Project may affect these industries and what measures Byron will implement to mitigate Project effects.

6.3.1 Agricultural

Agricultural use encompasses 96.9 percent of the Project Area, with corn and soybean crops covering the majority of the land area according to AcreValue (AcreValue, 2021). The remaining land is mostly comprised of woodlands, forage production, and non-cropland.

The Conservation Reserve Enhancement Program (CREP) is an offshoot of the Conservation Reserve Program (CRP), which is a land conservation program established by the USDA and administered by the Farm Service Agency that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production to improve environmental health and quality (USDA, 2021.). Minnesota implemented the CREP to target state-identified, high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the Reinvest in Minnesota (RIM) Reserve Program (BWSR, 2019). Enrollment in the CRP and CREP 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. No CREP or RIM parcels have been identified within the Project Area.

Dodge County

According to the U.S. Department of Agriculture's (USDA's) 2017 Census of Agriculture, of the 281,600 acres that comprise Dodge County, approximately 248,036 acres are farmland. A total of 611 individual farms are located in Dodge County, with the average farm size at 406 acres. The top crops (in acres) include grains, oilseeds, dry beans, dry peas, and other vegetables harvested for sale. Hogs and pigs top the list of livestock inventory, with a significantly smaller number of cattle and calves making up the remaining livestock (USDA, 2017a).

The 2017 market value of agricultural production in Dodge County was approximately \$238 million. Livestock, poultry, and their products accounted for approximately 42 percent of the total value of agricultural production, while crop sales accounted for the remaining 58 percent (USDA, 2017a).

Olmsted County

According to the USDA's 2017 Census of Agriculture, of the 419,200 acres that comprise Olmsted County, approximately 285,944 acres are farmland. A total of 1,139 individual farms are located in Olmsted County, with the average farm size at 251 acres. The top crops (in acres) include grains, oilseeds, dry beans, dry peas, and other vegetables harvested for sale. Hogs and pigs top the list of livestock inventory, with a significantly smaller number of cattle and calves making up the remaining livestock (USDA, 2017b).

The 2017 market value of agricultural production in Olmsted County was approximately \$214 million. Livestock, poultry, and their products accounted for approximately 43 percent of the total value of agricultural production, while crop sales accounted for the remaining 57 percent (USDA, 2017b).

Impacts and Mitigation

Solar Facility

The Solar Facility will impact approximately 1,529.7 acres of agricultural land within the anticipated Development Area by taking land out of row-crop production but will not result in a significant impact to land-based economies in the Project vicinity as this acreage constitutes well under one percent of the farmland in Dodge County (248,036 acres) and in Olmsted County (285,944 acres). Agricultural production would continue in the surrounding areas during construction and operation of the Project. In addition to removing agricultural lands from production, soils will be disturbed to accommodate project infrastructure including steel piles, access roads, inverter skids, fencing, transmission power poles, and the project substation. Impacts to the agricultural lands will primarily include soil compaction and a certain degree of soil profile mixing.

BMPs that will be implemented during construction to minimize and mitigate long-term impacts to agricultural lands including the following, among others:

- Reducing the overall disturbance footprint of the project by designing a project that minimizes access roads, fencing, transmission poles, and other infrastructure to the degree practicable,
- Separating, storing, and spreading topsoil to minimize soil profile mixing,

- Reducing rutting by halting construction during wet weather conditions,
- Decompacting soils following earthwork activities,
- Ensuring proper site drainage by identifying, avoiding, and repairing drain tile,
- Implementing erosion control practices such as silt fence installation and stock-pile stabilization to minimize the loss of agricultural soils to erosion.

Additionally, Byron Solar will attempt to limit the spread of noxious and invasive weeds by cleaning construction equipment before it enters the project area and by using only invasive-free mulches, topsoil, and seed mixes in accordance with the Vegetation Management and Stormwater Pollution Prevention Plans.

Impacts to agricultural lands will be further mitigated by incorporating erosion control measures during and following construction. Installation activities will implement erosion and sediment control BMPs outlined in the SWPPP that will be specifically prepared for the Project. The SWPPP will also include a discussion on topsoil and compaction management. During the operating life of the Project, erosion control will be further accomplished by establishment of a perennial vegetative cover under the solar arrays and installation of gravel roads with culverts (as necessary) to redirect concentrated surface water. These actions will preserve the soils in place and will likely result in less soil erosion than is typical with row crop agricultural activities.

Following construction, disturbed areas will be repaired and restored to pre-construction contours and characteristics. This restoration will allow the Project's land surfaces to drain properly, blend with the natural terrain, re-vegetate, and avoid erosion. Agricultural production would be allowed to continue in the area within the Project Area but outside the fence of the developed area during construction and operation of the Project. Similarly, if haying or grazing vegetation management strategies are used, some agricultural activities would continue within the Development Area.

Livestock is not located within or adjacent to the Project Area; therefore, no impacts to livestock are anticipated.

Byron has acquired leases, easements, and purchase agreements necessary for development of the project. Payments will be made by the Applicant to the owners of the land directly used for the Project. These payments will replace the revenue which would have been generated if agricultural production were continued by the landowners.

HVTL

Construction of the Project could cause minimal, temporary impacts to farmland from soil compaction and rutting, accelerated soil erosion, crop damage, temporary disruption to normal farming activities, and introduction of noxious weeds to the soil surface. Table 22 summarizes the impacts of the Proposed Route on existing farmland.

Byron will implement measures to reduce compaction, soil erosion, and the introduction of noxious weeds. Construction impacts to farmland would be short term and minimal in nature and would be mitigated through the proper use and installation of BMPs, such as minimizing the number of vehicles and protection and maintenance of topsoil during right-of-way clearing and generation-tie-line construction. Byron will further mitigate impacts on agricultural production by coordinating with landowners or farm operators regarding the timing of construction to avoid peak growing season by constructing the Project before spring planting or after harvest in the fall to the degree practicable. If this is not possible, Byron will compensate

the landowner or farm operator for crop damage, including any compaction that results from construction. See Section 4.0 for a discussion of construction methods and operation and maintenance procedures.

The Proposed Route was developed with attention to minimizing impacts to agricultural land; however, permanent impacts to agricultural land will occur where structures are placed in cultivated fields. Structures in cultivated fields act as barriers and can hinder efficient operation of large machinery. As described in Section 4.0, the Proposed Route predominately follows the railroad and field edges. The Applicant proposes to minimize impacts to agricultural land by generally placing structures along field edges. Based on discussion with landowners, structures will be placed 120 feet from the transmission line centerline to accommodate farm equipment in certain fields. Furthermore, the Applicant will make reasonable efforts to work with landowners to finalize the structure locations. The final spacing and location of structures will be designed to accommodate the movement of farm equipment within agricultural fields while still maintaining safety and design standards. The estimated permanent impacts from each transmission structure foundation will be 3 to 6 feet in diameter at the surface. Refer to Table 20 for an estimate of total acres of permanent impact from structures in agricultural lands. In addition, the Applicant estimates that the Proposed Substation will result in up to approximately 6.8 acres and the O&M Facility will result in up to 2.6 acres of construction impact on agricultural land.

The Applicant has designed the Proposed Route to avoid CREP and RIM parcels. If these easements are identified during the easement and title clearance process and final Project design requires transmission line structures to be placed on parcels enrolled in the CREP or RIM programs, the Applicant will work with landowners and the Board of Soil and Water Resources (BWSR) to address potential impacts to these conservation easements and to fully compensate landowners for lost CREP revenue resulting from the placement of the line within a CREP easement.

Additionally, aerial application of seeds, fertilizers, and crop protection chemicals are likely to occur within or near the Project. The construction of the Solar Facility and HVTL have the potential to impact crop spraying by creating physical obstacles within the flight paths required to perform aerial application activities. Even if the Project components are not directly located within the field requiring treatment, the HVTL adjacent to fields where aerial application occurs can impact the airspace required for pilots to turn for their next pass over the field. These impacts may result in higher costs to the farmers from the increased time and complexity of spraying or may result in the fields requiring ground application. Additionally, meteorological towers may impact aerial application activities (DOC EERA, 2019). Byron Solar will coordinate with landowners on a case-by-case basis regarding crop dusting.

Post-construction restoration efforts will include restoration of any temporary access modifications and deep plowing to remove compaction. Both crop and livestock activities will be able to continue around Project facilities after construction. While no impacts to agricultural land are anticipated during operation of the Project, if impacts to crops do occur during operation or maintenance of the transmission line, Byron will compensate the landowner or farm operator for crop damages.

6.3.2 Forestry

The anticipated Development Area and associated Transmission Line are located solely on agricultural land. Similarly, there are no resources within the Project Area considered to be forestry resources for commercial use. The primary tree cover within the Project Area is

associated with undeveloped wetlands and waterways, fence lines, and old shelterbelts adjacent to homesteads.

There are no forestry operations or wooded areas along the Proposed Route. Two trees are located near the right-of-way, halfway between both the Byron Substation and the Project Substation. The Applicant made every effort to develop a Route that minimizes tree clearing.

Impacts and Mitigation

Solar Facility

No economically significant forestry resources will be affected by the Solar Facility; therefore, no mitigation measures are proposed.

HVTL

No economically significant forestry resources are present along the Proposed Route; therefore, no mitigation measures specific to forestry operations are proposed. The Project may result in the removal or trimming trees within and/or adjacent to the transmission line right-of-way to ensure it is clear of obstructions. Any removal or trimming outside the right-of-way would require landowner approval. Vegetation management is necessary for the safe operation of the transmission line as tree branches can cause stress on transmission lines and increase the risk of outages, especially in areas with a strong wind resource, which is typical of this area of the state.

To the extent possible, Byron will minimize the need for trimming and removal of trees during construction and operation of the transmission line. Where trimming of trees is necessary, it will be performed with best practices for tree trimming so as to minimize stress on trees.

6.3.3 Tourism

This region draws tourists to participate in recreational activities such as festivals, fairs, markets, museums, celebrations and outdoor recreation like fishing, boating, camping, bicycling, and hiking. Primary tourism activities in the vicinity of Project facilities are associated with the recreational resources discussed in Section 6.2.9, and local community festivals and other events. Examples of local community festivals include summertime events like the Dodge County Free Fair (dodgecountymuseum.com, 2021). A single snowmobile trail (Trail 302) traverses the Project Area. Otherwise, there are no recreation resources located in the Project Area. The next nearest recreational resources are the Tri-cooperative WMA located 1.5 miles south, two trails: 16th Street NE Trail (1.2 miles north) and 5th Avenue NE Trail (1.5 miles northwest); and two parks within Kasson, Lions Park (1.6 miles northwest) and East Diamond Park (1.3 miles northwest).

Tourism in the vicinity of the Project Area centers around Mantorville and activities in or around the city. This includes fairs, shows, and festivals, such as the Mantorville Melodramas, the Fall Festival, Christmas in Wasioja, and outdoor recreational opportunities described in Section 6.2.9. Additionally, there are many 5Ks and other runs in both Kasson and Byron. The Mantorville Melodramas are put on from June to August and change about every two-three weeks. The City of Mantorville's Fall Festival included hay wagon rides, ghost tours, and pumpkin painting (Mantorville, 2021).

Impacts and Mitigation

Solar Facility

Because all Solar Project facilities will be located on private lands, there will be no direct impacts to existing tourism activities that typically generate revenue for the local community.

Short-term increases in noise and dust would occur during construction of the Project and could detract from public enjoyment of nearby recreational activities and tourism. However, these impacts would be minimal, and use of BMPs to limit noise (muffled equipment) and fugitive dust (standard dust suppression techniques) during construction would effectively mitigate the effect of short-term increases in noise and dust.

Section 6.2.4 discusses how the Applicant would mitigate potential noise impacts and Section 6.6.1 provides a discussion of how the Applicant would mitigate fugitive dust emissions during construction of the Project.

Introduction of an aesthetic change to the predominantly agrarian landscape in the Project Area could impact public enjoyment of available tourist attractions. The Applicant has minimized impacts to tourism opportunities by siting the Proposed Route to avoid recreation areas and municipalities where tourism opportunities are available. A detailed discussion of how the Project could impact aesthetics and the measures the Applicant would use to mitigate aesthetic impacts is provided in Section 6.2.6.

The Applicant will construct the solar facilities within the limits of the Project Area and no road closures are anticipated during active construction of the Solar Facility, but will be closely coordinated with city, county and state staff if determined necessary. The annual events hosted by Dodge County do not occur within the Project Area; most of these events are held within city limits or in areas outside of the Project Area. No impacts to these events are anticipated during construction or operation of the Solar Facility.

Snowmobile Trail 302, which runs through the central and southern portions of the Solar Facility, will require realignment around the fenced area. The Applicant will coordinate with Dodge County, participating landowners, and applicable snowmobile trail clubs to reroute the trail to allow for both uses.

No impacts to tourism and recreational activities are anticipated, and therefore no mitigation measures are proposed.

HVTL

Construction of the HVTL is not anticipated to affect public access to nearby tourism and recreational opportunities. Impacts on tourism would mostly be related to HVTL construction, which will be minimal, temporary, and isolated to specific areas throughout the Proposed Route. These temporary impacts are anticipated to be similar to those from the Solar Facility, will likely include construction noise and fugitive dust, and will be properly mitigated using BMPs described above. Although construction of the HVTL may require temporary short-term road or lane closures, construction and operation of the HVTL is not expected to impact public access to any of the activities held in and around the Proposed Route.

6.3.4 Mining

Mining does not comprise a major industry in Dodge or Olmsted counties, but can be found throughout the counties. According to MnDOT, there is one Gravel Pit (20039), three Rock quarries (Himle Quarry 20048, Old Brown Quarry 20049, and Tvedt Quarry 55214), and one Aggregate Pit (Prospected) located within 1 mile of the Solar Facility. Based on recent aerial photography, only the Old Brown Rock Quarry and Tvedt Quarry appear to be active. The Old Brown Rock Quarry is located along 270th Avenue, about 0.1 mile south of County Road 6 and the Solar Facility boundary. The Tvedt Quarry is located about 1 mile east of the Solar Facility (MnDOT, 2018). The two active quarries are shown on Map 6.

There are no gravel pits within the Proposed Route right-of-way in Dodge County or Olmsted County (MnDOT, 2018).

Impacts and Mitigation

No mining resources are located within the Project Area. Construction of the Project will require the use of sand and aggregate for structure backfill and to construct reliable access routes for construction equipment. Based on availability, some of the sand and aggregate material could come from sources nearby the Project. Increased demand for sand and aggregate material as a result of the Project would be temporary and limited to the period of construction. Additional new mining operations or expansion of existing mines would not be necessary to satisfy Project demand.

No direct impacts to mining operations will occur as a result of the Project and no mitigation measures are proposed.

6.4 Archaeological and Historical Resources

In May 2020 and updated in November 2020, a review of records was conducted through a request for data from the Minnesota State Historic Preservation Office (SHPO) and a review of the online Portal maintained by the Minnesota Office of the State Archaeologist (OSA) for the Project Area and a 1-mile buffer surrounding these boundaries. No evidence of previous cultural resources surveys was obtained during the review.

Two previously recorded archaeological sites are within 1 mile of the Project Area, neither of which are within the Project Area boundaries. Sites 21OL0035 and 21OLq are both within the city of Byron, east of the Project Area. Site 21OL0035, the Byron Whistle Stop, is a structural ruin consisting of two small piers possibly associated with the Chicago & Northwestern railroad. Site 21OLq is an alpha site. An alpha site is a site reported through historic documentation or a landowner report, but not officially recorded by an archaeologist. Site 21OLq is the ghost town of Byron as recorded in the Minnesota Historical Society Ghost Town File.

Seventeen historic/architectural resources have been previously inventoried within one mile of the Project Area. One resource is located in the Project Area; U.S. Highway 14 corridor (SHPO Inventory #XX-ROD-016/OL-ROD-001) bisects both the northern third of the Project boundary and the one-mile buffer. The resources have not been evaluated for the National Register of Historic Places (NRHP); not all SHPO inventory forms could be located to confirm their eligibility.

Impacts and Mitigation

Solar Facility

Construction of solar facilities have the potential to affect archaeological sites through ground disturbance that could impact or destroy archaeological resources. No previously recorded archaeological or historic sites will be directly impacted by the proposed Solar Facility. A Phase I archaeological survey of the Project Area was completed in October and November 2020 and May 2021. A single isolated find consisting of a prehistoric utilized flake was identified. This site is not significant, and no avoidance is necessary. The Phase I archaeological survey report is attached to this application as Appendix J and has been provided to SHPO for review and comment. The SHPO responded on July 9, 2021 and concurred with the finding that the prehistoric utilized flake (site 21DO0020) is not eligible for listing in the NRHP (Appendix C).

HVTL

Construction of the Transmission Line has the potential to affect archaeological sites through ground disturbance that could impact or destroy archaeological resources. Also, historic architectural resources could receive a negative visual impact by the placement of transmission line structures within the resource's viewshed.

No previously recorded archaeological or historic sites will be directly impacted by the proposed Project. No State Register or NRHP listed or eligible structures are located within the viewshed of the Transmission Line. A Phase I archaeological survey of the Transmission Line route was completed in May 2021. No archaeological resources were identified. The results of this survey will be included in the Phase I Archaeological Survey Report for the Solar Facility.

Before construction of the Project begins, the Applicant will prepare an Unanticipated Discoveries Plan that will outline steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction. Should previously unknown archaeological resources be inadvertently encountered during Project construction and/or operation, the discoveries will be reported to the SHPO. Should human remains be inadvertently discovered, Minnesota Statute § 307.08 will be followed, all work will cease, law enforcement will be immediately contacted, and the OSA will be notified.

6.5 Tribal Coordination

Although the Project has no federal nexus requiring consultation with Native American tribes, the Applicant requested tribal comments. The Applicant sent letters to the eleven Minnesota Tribal Nations' Tribal Historic Preservation Office (THPO) contacts and the Minnesota Indian Affairs Council via email on March 19, 2021 and by certified mail on March 22, 2021. As of the preparation of this document, one THPO had responded showing interest in the Project. On March 21, Samantha Odegard with the Upper Sioux Community requested additional information. Ms. Odegard was informed of the archaeological survey and invited to send a tribal representative to visit the Project Area when follow up archaeological survey was scheduled in the spring. On April 26, Ms. Odegard indicated they will take a closer look when the remaining fieldwork is complete. In a letter dated April 7, but emailed to the Applicant on May 21st, the Upper Sioux Community THPO stated they had no further comment on this site, but should the project inadvertently uncover human remain or funerary artifacts, work must stop, and the MN SHPO and USC THPO notified. The response is included in Appendix C. The Applicant will notice the Minnesota Tribal Nations on the availability of the Site and Route Permit application.

Based on tribal correspondence, no impacts to Tribal communities are anticipated.

6.6 Natural Environment

6.6.1 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” to protect health, the environment, and property. The six criteria pollutants are ground-level ozone (O₃), particulate matter (PM₁₀/PM_{2.5}), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and lead (Pb) (USEPA, 2021). Minnesota is currently complying with all the NAAQS (MPCA, 2021d) and the Project Area presently meets federal air quality standards.

In Minnesota, air quality is tracked using air quality monitoring stations across the State. The MPCA uses data from these monitors to calculate the Air Quality Index (AQI), on an hourly basis, for O₃, PM_{2.5}, SO₂, NO₂, and CO. The pollutant with the highest AQI value for a particular hour sets the overall AQI for that hour. The AQI is used to categorize the air quality of a region as one of five levels of quality: good, moderate, unhealthy for sensitive groups (USG), unhealthy, or very unhealthy (MPCA, 2021e).

The Project is located nearest to the air quality monitor in Rochester, Minnesota. This station monitors for O₃ and PM_{2.5}. The AQI for Rochester, Minnesota for the past five years is provided in Table 23 (MPCA, 2021f). An annual AQI summary report was not available for the year 2020.

Table 23: Days in Each Air Quality Index Category

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2019	313	51	0	0	0
2018	292	69	0	0	0
2017	312	53	0	0	0
2016	327	36	1	0	0
2015	315	49	1	0	0

Air quality has been considered good for the majority of the past five reported years in Rochester. Since 2015, the largest number of days classified as moderate occurred in 2018, with a couple day each in 2015 and 2016 where air quality was considered unhealthy for sensitive groups. No days have been classified as unhealthy or very unhealthy.

Impacts and Mitigation

Minor temporary effects on air quality are anticipated during construction of the proposed Solar Facility and HVTL as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust that becomes airborne during dry periods of construction activity. During construction, the amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types,

and road surface characteristics. Dust emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Air emissions during construction would primarily consist of emissions from construction equipment and would include carbon dioxide, nitrogen oxides, and particulate matter; dust generated from earth disturbing activities would also give rise to particulate matter. Emissions from construction vehicles will be minimized by using modern equipment with lower emissions ratings. Adverse effects on the surrounding environment are expected to be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

BMPs will be used during construction and operation of the Project to minimize dust emissions if wind erosion becomes an issue. If construction activities generate problematic dust levels, the Applicant may employ construction-related practices to control fugitive dust such as 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, and covering open-bodied haul trucks. Other practices may include containment of excavated material, protection of exposed soil, soil stabilization, reducing speed limits within construction zones, and treating stockpiles to control fugitive dust. A SWPPP will be developed prior to construction that will include BMPs to minimize the potential for fugitive dust. Over the long term, dust emissions currently experienced annually in the area through farming practices are likely to be reduced through the establishment of perennial vegetative cover.

Solar Facility

The Solar Facility is expected to 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 and other pollutant emissions detrimental to air quality. Additionally, since agricultural operations at the Solar Facility site will no longer occur during construction and operation of the facility, reduced particulate emissions, dust and farm equipment exhaust would occur and further improve air quality at and in the vicinity of the site. Following construction, the facility will not generate pollutant emissions. Following construction, the Solar Facility will not generate pollutant emissions.

HVTL

During operation of the HVTL, air emissions would be minimal. An insignificant amount of ozone is created due to corona from the operation of transmission lines (Whitmore and Durfee, 1973; U.S. Department of Energy, Bonneville Power Administration, 1989). A corona signifies a loss of electricity, and the Applicant has engineered the Transmission Line so as to limit the corona. The production rate of ozone due to corona discharges decreases with humidity and less significantly with temperature. Rain causes an increase in ozone production, but also accelerates the decay of ozone. Ozone production by high voltage transmission lines is not detectable during fair weather above ambient conditions. Ozone production under wet weather conditions is detectable with special efforts but is still considered insignificant.

Design of the Transmission Line also influences its ozone production rate. The production rate decreases significantly as the conductor diameter increases and is greatly reduced for bundled conductors over single conductors. The production rate of ozone increases with applied voltage.

The emission of ozone from the operation of a 345 kV Transmission Line is not anticipated to have a significant impact on air quality and no mitigation is proposed.

6.6.2 Geology

The Applicant completed a Geotechnical Engineering Report for the Project in March 2021. The report describes the project site as being located in the Dissected Till Plains of Minnesota. The Dissected Till Plains of Minnesota are part of the Central Lowlands, a physiographic province of the United States, which extends from the Canadian Shield in Saskatchewan and central Minnesota southward and eastward to the Coastal Plains. The surface elevation in the Project Area ranges from approximately 1,224 to 1,310 feet. The Project Area consists of rolling hills and is underlain by surficial glacial and post glacial alluvium deposits, glacial outwash, and till. These quaternary units overlay Devonian sedimentary rock.

Sinkholes were noted in the southeastern portion of the Project Area. Other susceptible geologic features such as shallow limestone formations or unconfined/shallow aquifers are not present in the vicinity of the Project Area. Three karst point features identified as sinkholes in the MNDNR Karst Database were inspected during the geotechnical evaluation, and significant depressions were not observed. Regardless, the arrays and foundations will be properly designed, and graded filters used within any identified sinkholes as needed. The underlying bedrock is at varying depths across the site but may be encountered at shallow depths especially in the southwestern portion of the Solar Facility as shown in the geotechnical report.

Impacts and Mitigation

Solar Facility

Predrilling of bedrock is possible due to the thickness of surficial materials of approximately 0-150 feet in Dodge County (Steenberg, 2019), and 0-125 feet in Olmsted County (Steenberg et al., 2020). The geotechnical report identified the southwestern and southeastern edges of the Solar Facility as the most likely location to encounter shallow bedrock. The geotechnical report did not identify glacial till obstructions such as cobbles and boulders as a potential concern for pile construction but mentioned that isolated obstacles could still be encountered.

The Applicant will carefully consider foundation design with the identified potential for shallow bedrock and isolated obstacles to exist in the Solar Facility. Impacts to geologic resources would be limited to installation of racking system foundations using predrilling techniques. In areas of shallow bedrock, the racking system may require concrete foundations (instead of driven piers) depending upon site specific soil conditions and geotechnical analysis.

HVTL

Along the Proposed Route there is the potential for bedrock to be encountered as public data shows bedrock in the range of 0-100 feet below ground. Additional geotechnical investigations will be performed for the Transmission Line right-of-way prior to construction to determine areas of shallow bedrock. If shallow bedrock is encountered during the geotechnical evaluations, appropriate actions will be taken to minimize disturbance and properly engineer pole foundations.

6.6.3 Groundwater

Minnesota is divided 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 within the Karst Province, which is characterized by thin glacial sediments overlying thick and extensive bedrock (carbonate and sandstone) prone to karst features such as solution conduits, sinkholes, and caves (MNDNR, 2021g).

The Applicant reviewed the Project Area for USEPA designated sole source aquifers (SSA), wells listed on the Minnesota County Well Index (CWI), and MDH Wellhead Protection Areas (WHPAs) and Special Well and Boring Construction Areas. The USEPA defines a 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, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer (USEPA, 2021a). There are no EPA-designated SSAs in the Project Area (USEPA, 2021b).

6.6.3.1 County Well Index

The CWI is the most complete record of well locations in Minnesota and is kept up-to-date and maintained by the Minnesota Geological Survey in cooperation with the MDH. Based on the Dodge County Geologic Atlas, Part A, there are nine well log records within the Solar Facility (MGS, 2020a). There are no well log records mapped within the HVTL route (MGS, 2020b). Among wells in the CWI that are within the Solar Facility, one well had a recorded depth to groundwater of 71 feet. Mapped wells are depicted on Map 8 and listed below in Table 24.

Table 24: County Well Index

Well ID	Use	Date Drilled	Status	Well Depth (feet)
217643	Domestic	02/00/1966	Active	194
340162	Borehole	07/13/2017	Sealed	40
1000002984	Domestic	00/00/1930	Active	80
340170	Borehole	07/12/2017	Sealed	40
340161	Borehole	07/13/2017	Sealed	25
340177	Borehole	07/13/2017	Sealed	30
340149	Borehole	07/13/2017	Sealed	40
1000003205	Domestic	Unknown	Active	Unknown
340164	Borehole	07/14/2017	Sealed	40

6.6.3.2 Wellhead Protection Areas

Under the Safe Drinking Water Act (SDWA), each state is required to develop and implement a Wellhead Protection Program to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. The SDWA was updated

in 1986 with an amendment requiring the development of a broader-based Source Water Assessment Program, which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. A WHPA encompasses the area around a drinking water well where contaminants could enter and pollute the well.

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 the MDH's Source Water Protection Web Map Viewer (MDH, 2019). The viewer also includes Drinking Water Supply Management Areas (DWSMA) and DWSMA Vulnerability. According to the viewer, there are no WHPAs within the Solar Facility or Proposed Route right-of-way. The nearest WHPAs are located in Byron, approximately one mile east of the Byron Substation, and in Kasson, approximately 0.8-mile northwest of the Solar Facility. These WHPAs also include the DWSMA, which is the MDH approved surface and subsurface area surrounding a public water supply well that completely contains the WHPA. The DWSMA Vulnerability is an assessment of the likelihood for a potential contaminant source within the drinking water supply management area to contaminate a public water supply well. The DWSMA Vulnerability rating for Byron and Kasson is Low.

6.6.3.3 Special Well and Boring Construction Areas

Special Well and Boring Construction Areas (formerly known as Special Well Construction Areas or Well Advisories) are areas where groundwater contamination has, or may, result in a risk to public health. These areas have rules pertaining to the construction of wells and borings that place minimum restrictions on the location, construction, repair, and sealing of wells and borings. There are no Special Well and Boring Construction Areas in Dodge or Olmsted counties (MDH, 2021).

6.6.3.4 Pollution Sensitivity

Pollution sensitivity maps for bedrock have been created for 19 counties in Minnesota, including Olmsted. Sensitivity was rated by combining attributes of the bedrock and surficial geologic units including sediment texture, fractures in the bedrock, thickness of material, and depth to water table. The pollution sensitivity of the bedrock surface is portrayed by a map that characterizes the relative rate of vertical travel of a contaminant that moves conservatively with water from the land surface to the shallowest bedrock surface. Interpretation of pollution sensitivity of the bedrock surface is based on overlapping estimated time-of-travel ranges. According to the Minnesota Hydrogeology Atlas map (MDNR, 2015), areas adjacent to the Solar Facility in Olmsted County are rated as having a Very High (hours to months) to Low pollution sensitivity rating (decades to a century). In general, areas rated Very High have karst limestone or dolomite occurring within 5 feet of the land surface or are in terrace deposits along river valleys, and areas of moderate or low sensitivity were limited to thick sequences of till or thin till over a confining bedrock unit (Adams, 2016). The areas of Very High and High sensitivity ratings are generally located adjacent to the southeast portion of the Solar Facility. Areas surrounding the Proposed Route in Olmsted County are rated as Low.

Impacts and Mitigation

Solar Facility and HVTL

Soil disturbances are generally anticipated to be limited to the ground surface and upper soil column. It is anticipated that there will be minimal contact with the surficial water table, and no contact with deeper groundwater or aquifers. The direct-embedded piers will be installed to a

depth of approximately 5 to 12 feet below the soil surface and foundations for the transmission poles and substation are not anticipated to extend beyond that depth. Due to the limited amount of soil disturbances, impacts to groundwater from the construction or operation of the Project are not anticipated.

According to the geotechnical report, shallow groundwater was encountered throughout the Project Area at depths ranging from approximately 3.7 feet to 23.6 feet below existing ground surface based on soil borings. While shallow groundwater was identified as a potential concern due to the need for dewatering during construction, the geotechnical report states that a dewatering system consisting of a sump and pump may be sufficient. Typically, dewatering is not required for installation of the pile foundations.

Impacts to groundwater resources, including aquifers, are not anticipated during Project operations as water supply needs will be quite limited. It is probable that operations and maintenance water requirements will be satisfied with a municipal water account or from a single domestic-sized water well. A municipal water source will be used if available. If unavailable, a groundwater well would be installed for domestic purposes within the O&M facility to serve a restroom and small kitchen for approximately 4 employees. The water draw would be similar to a single-family residence.

About 226.7 acres of impervious surface will be created by Project components (access roads, inverter skids, and about half of the solar array area). Surface water that flows onto or falls on the impervious surfaces will flow into vegetated areas and stormwater basins before infiltrating into the groundwater.

Impacts to groundwater resources are not anticipated as there are no SSAs, WHPAs, or Special Well and Boring Construction Areas within the Project Area.

Any unidentified wells within the anticipated Development Area will be capped and abandoned in place according MDH requirements. Unidentified wells that have already been sealed within the anticipated Development Area include 340149, 340177, 340170, 340164, and 340161. All domestic wells that are located outside of the anticipated Development Area will not be sealed. The Applicant will continue to work with the landowners to identify any additional wells that may be within the Project Area.

Construction of Project facilities is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock is not anticipated. Any dewatering required during construction will be discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts. If significant dewatering is necessary, the Applicant will obtain a Water Appropriation Permit from MNDNR.

The Project will not require the use or storage of large quantities of hazardous materials that might otherwise have the potential to spill or leak into area groundwater. A SPCC Plan will be required for the main industry-standard power transformers located in the Project Substation. The transformers will be properly contained per USEPA requirements.

6.6.4 Soils and Prime Farmland

Soil characteristics within the Project Area were assessed using the USDA Soil Survey Geographic Database (SSURGO) (Soil Survey Staff, 2020). The SSURGO database is a digital

version of the original county soil surveys developed by the NRCS for use with GIS. It provides the most detailed level of soils information for natural resource planning and management.

6.6.4.1 Soils

Soils, underlying bedrock formations and other geologic features were identified during desktop evaluations using applicable GIS layers.

The soils deposited in the area are characteristic of glacial and post-glacial activity and are summarized in Table . The regional surficial soil type is dominated by glacial till or glacial outwash. The origin of the soil types found in the region (predominantly clays), is related to sediment that glaciers accumulated, carried, and deposited.

The soils in the Project Area identified in the field during the geotechnical investigations consist of topsoil overlying primarily lean clay with varying amounts of sand (glacial till). Sand content in the clay was highly variable with up to 50 percent in some samples. Cobbles and boulders were not encountered when drilling in the glacial till deposits, but isolated obstacles could still be encountered.

Soils listed as predominantly hydric are scattered throughout the Project Area. No soils are classified as all hydric within the Project Area. Wetlands are associated with some of these areas, however other areas appear to be effectively drained by agricultural practices. There are no known springs or seeps within the Project Area. Soil resources within the Project Area are shown in Table 25 and on Map 11 and are classified as predominantly moderate for erodibility.

Table 25: Soils within the Solar Facility

Map Unit	Soil Name	Drainage Class	Wind Erodibility	Hydric Class ¹	% Hydric	Acres
M511A	Readlyn silt loam, 1 to 3 percent slopes	Somewhat poorly drained	Moderate Erodibility	Predominantly non-hydric	5	437.16
M506B	Kasson silt loam, 2 to 6 percent slopes	Moderately well drained	Moderate Erodibility	Non-hydric	0	368.11
M515A	Tripoli clay loam, 0 to 2 percent slopes	Poorly drained	Moderate Erodibility	Predominantly hydric	90	253.82
M507A	Marquis silt loam, 1 to 3 percent slopes	Moderately well drained	Moderate Erodibility	Non-hydric	0	231.44
M518B	Clyde-Floyd complex, 1 to 4 percent slopes	Poorly drained	Moderate Erodibility	Partially hydric	60	178.17
M526B	Winneshiek silt loam, 2 to 6 percent slopes	Well drained	Moderate Erodibility	Non-hydric	0	106.44
M517A	Clyde silty clay loam, 0 to 3 percent slopes	Poorly drained	High Erodibility	Predominantly hydric	95	74.85
M508A	Oran silt loam, 1 to 4 percent slopes	Somewhat poorly drained	High Erodibility	Predominantly non-hydric	5	73.74
M526C2	Winneshiek silt loam, 6 to 12 percent slopes, moderately eroded	Well drained	Moderate Erodibility	Non-hydric	0	40.25
1027A	Coland-Spillville, complex, 0 to 2 percent slopes, flooded	Poorly drained	Moderate Erodibility	Partially hydric	55	11.89

Table 25: Soils within the Solar Facility

Map Unit	Soil Name	Drainage Class	Wind Erodibility	Hydric Class¹	% Hydric	Acres
M509C2	Mantorville loam, 6 to 12 percent slopes, moderately eroded	Well drained	High Erodibility	Non-hydric	0	10.56
M527D2	Nasset-Winneshiek complex, 12 to 18 percent slopes, moderately eroded	Well drained	High Erodibility	Non-hydric	0	8.44
N578B	Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded	Well drained	High Erodibility	Non-hydric	0	3.20
M509B	Mantorville loam, 2 to 6 percent slopes	Well drained	High Erodibility	Non-hydric	0	2.09
M523C2	Bassett-Kasson complex, 6 to 12 percent slopes, eroded	Moderately well drained	Moderate Erodibility	Non-hydric	0	0.74
Total						1,801.0
¹ Partially hydric soil means that at least one major component of the soil unit is rated as hydric, and at least one other major component is not rated hydric. Predominantly hydric soil means components that comprise 66 to 99 percent of the map unit are rated as hydric.						

The SSURGO data shows that the various soil types crossed by the Proposed Route are silt and clay loams that range from poorly drained to well-drained as shown in Table 26.

Table 26: Soils within HVTL Proposed Route

Map Unit	Soil Name	Drainage Class	Wind Erodibility	Hydric Class¹	% Hydric	Acres
M511A	Readlyn silt loam, 1 to 3 percent slopes	Somewhat poorly drained	Moderate Erodibility	Predominantly non-hydric	5	12.53
N555B	Tama-Dinsmore complex, 2 to 6 percent slopes	Well drained	Moderate Erodibility	Non-hydric	0	8.71
M507A	Marquis silt loam, 1 to 3 percent slopes	Moderately well drained	Moderate Erodibility	Non-hydric	0	8.02
M518B	Clyde-Floyd complex, 1 to 4 percent slopes	Poorly drained	Moderate Erodibility	Partially hydric	60	6.22
M515A	Tripoli clay loam, 0 to 2 percent slopes	Poorly drained	Moderate Erodibility	Predominantly hydric	90	5.93
176	Garwin silty clay loam	Poorly drained	High Erodibility	Predominantly hydric	95	3.54
285B	Port Byron silt loam, 2 to 6 percent slopes	Well drained	Moderate Erodibility	Non-hydric	0	3.02
N514B	Joy-Ossian, occasionally flooded, complex, 1 to 5 percent slopes	Somewhat poorly drained	Moderate Erodibility	Predominantly non-hydric	25	2.27

Table 26: Soils within HVTL Proposed Route

Map Unit	Soil Name	Drainage Class	Wind Erodibility	Hydric Class ¹	% Hydric	Acres
285C	Port Byron silt loam, 6 to 12 percent slopes, moderately eroded	Well drained	Moderate Erodibility	Non-hydric	0	0.94
285A	Port Byron silt loam, 0 to 2 percent slopes	Well drained	Moderate Erodibility	Predominantly non-hydric	5	0.85
203	Joy silt loam, 1 to 4 percent slopes	Somewhat poorly drained	Low Erodibility	Predominantly non-hydric	5	0.61
493C	Oronoco loam, 6 to 12 percent slopes	Well drained	Moderate Erodibility	Non-hydric	0	0.03
Total						52.7
¹ Partially hydric soil means that at least one major component of the soil unit is rated as hydric, and at least one other major component is not rated hydric. Predominantly hydric soil means components that comprise 66 to 99 percent of the map unit are rated as hydric.						

Impacts and Mitigation

Solar Facility and HVTL

Impacts to soils will occur during both the construction and operational stages of the Project, and will generally include soil compaction, soil mixing and rutting during construction and compaction during operation. Grading impacts will primarily be associated with the construction of foundations for the Project Substation, access roads, O&M Facility, and spot grading for the solar arrays and inverter skids. Impacts to soils will also occur with transmission pole installation for the associated Transmission Line. Because the Project is located on agricultural fields and rolling terrain, a moderate amount of grading will be necessary for the Project overall given its size. In addition, some soil compaction may result from the installation of the direct-embedded piers for the solar arrays and inverter skids. Soil compaction will be mitigated by regrading and tilling these areas following construction. Some soil mixing will likely occur during installation of collection lines, HVTL power poles and during base preparation for the project substation, laydown and O&M facilities. Soil mixing will be minimized to the degree possible by stockpiling topsoil separately from the underlying subsoil. Once construction work is completed, disturbed areas will be backfilled with subsoil followed by topsoil.

During operation of the Solar Project, ongoing soil compaction could occur from the use of access roads. This impact is expected to be negligible and confined to the roadbed. In the long term, the Project is expected to reduce the potential for erosion by establishing permanent vegetation, in contrast to the amount of exposed soils common to row cropping. Potential erosion will be further minimized by dressing access roads with gravel and installing culverts under access roads where necessary to redirect concentrated runoff.

A NPDES/SDS Construction Stormwater General Permit to discharge stormwater from construction facilities will be acquired by the Project from the MPCA. BMPs such as silt fencing, temporary seeding/stabilization, or erosion blankets will be used during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion, whether the erosion is caused by water or wind. Practices may include containment of excavated material, protection of exposed soil, stabilization of restored material, and treating stockpiles to

control fugitive dust. A SWPPP will be developed for the Project prior to construction that will identify specific BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent erosion. Because the Project will disturb more than 50 acres and is within 1 mile of an impaired water (Salem Creek), the Applicant will submit the SWPPP to MPCA for review and approval at least 30 days prior to construction.

Stormwater on the site will be managed through a series of 38 National Urban Runoff Program (NURP) stormwater ponds required to satisfy MPCA and NPDES stormwater management requirements (Map 3). The number, location and size of the stormwater ponds were determined by completing a detailed stormwater management study for the Project. The stormwater management system has been designed in accordance with MPCA stormwater management for solar projects guidance, and in compliance with the NPDES/SDS Construction Stormwater General Permit. The NPDES/SDS Construction Stormwater General Permit requires post-construction stormwater management best practices to treat 1.0-inch of runoff from new impervious surfaces, primarily gravel access roads in the case of solar installations. The basins have been designed to meet storage volumes and provide the necessary treatment. These areas will be vegetated with a wet seed mix that will help stabilize soils after rain events.

The Applicant evaluated the use of infiltration basins, but wet sedimentation basins were determined to be the most appropriate solution. The site consists of primarily of Hydrologic Soil Group (HSG) B/D, C and C/D soils. Type A soils have low runoff potential and high infiltration rates. Type B soils have moderate runoff potential and infiltration rates. Type C soils have moderate runoff potential and low infiltration rates. Type D soils have high runoff potential and low infiltration rates. While there are areas of C soils onsite, due to the numerous D soils and proximity to the C soils, it was assumed that all soils onsite would have difficulties infiltrating. Based on the predominance of low infiltrating soils types, it was determined that wet sedimentation basins would be the most prudent option for the Project.

The ponds are anticipated to have approximately 3 feet of standing water at all times. To function according to MPCA requirements, the wet sedimentation ponds are expected to hold water for proper rate control and treatment. The stormwater ponds are strategically placed to capture water without requiring additional grading to direct flow, reducing overall soil impacts required to grade the pond areas. The proposed wet sedimentation basins will treat stormwater from the Project in accordance with MPCA requirements. At the end of the Project's useful life, stormwater pond areas will be graded to match surrounding contours, decompacted, and topsoil spread to accommodate agricultural activities in accordance with the decommissioning plan and AIMP.

Additionally, the Applicant will work with participating landowners to identify and avoid existing drain tile currently functioning to drain hydric soil areas. Drainage will be augmented by additional drain tile, as needed, in areas of know hydric soils to ensure proper drainage is maintained in the post-construction condition.

6.6.4.2 Prime Farmland

Nearly all of the Project is located on prime farmland/prime farmland if drained as shown on Map 11. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pasture, woodland, or other lands). Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for

long periods and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating) (USDA NRCS, 2020).

Soils categorized as wind or water erodible may require additional mitigation measures to minimize the likelihood of soil migration outside of Project workspaces. Hydric soils are generally indicative of long periods of saturation or flooding during soil formation and can indicate wetland environments if vegetation and other hydrologic factors are present. Soils with revegetation concerns can indicate a need for additional mitigation measures during restoration to ensure revegetation of Project workspaces is successful.

Soils categorized as prime farmland and farmland of statewide importance are protected under the Farmland Protection Policy Act (FPPA) because of their value for agricultural production, and a significant or irreversible loss of these high-quality farmlands could have local economic impacts for the agricultural industry (see Section 6.3.1).

The Project is sited on approximately 1,256 acres of prime farmland, 52.5 acres of farmland of statewide importance, 2.3 acres of prime farmland if protected, and 522.6 acres of prime farmland if drained (Map reference and a detailed discussion in Section 3.1.2 and Table 6). Additionally, under Minn. R. 7850.4400, subp. 4, limits the use of prime farmland for energy generating facilities to 0.5 acres per 1 MW unless there is no feasible and prudent alternative. Given the 200 MW net generating capacity of the Project, this rule would allow use of up to 100 acres of prime farmland for the Project. These acreages of prime farmland would be taken out of production for the anticipated 35-year life of the Project with the intent to restore it to productive use at the end of the Project's life.

A discussion of the amount of prime farmland, farmland of statewide importance, hydric soils and compaction-prone soils within the anticipated Development Area and Proposed Route are provided below.

Solar Facility

As shown in Table 27, approximately 1,079.8 acres of prime farmland, 420.8 acres of prime farmland if drained, and 43.5 acres of farmland of statewide importance are located within the anticipated Development Area. These acreages of prime farmland would be taken out of production for the life of the Project but would not be permanently removed. Due to a lack of other environmental constraints, adequate roads for access, flat terrain, and proximity to a substation, the Project Area was identified as an attractive location for a solar facility.

Table 27: Prime Farmland Classifications within Development Area

Farmland Classification	Acreage	Percent of Development Area
Prime Farmland	1,079.8	70.0%
Prime Farmland if Drained	420.8	27.0%
Prime Farmland if Protected from Flooding	0.0	0.0%
Farmland of Statewide Importance	43.5	3.0%
Not Prime Farmland	8.4	1.0%
TOTAL	1,552.6	100%
Note: The total shown in this table may not equal the sum of addends due to rounding.		

HVTL

As shown in Table 28, approximately 52.7 acres of soils crossed by the Proposed Route are classified as “Prime Farmland.” Of this, 33.8 acres are prime farmland, 15.7 acres are prime farmland if drained, and 2.3 acres are considered prime farmland if protected from flooding or not frequently flooded during the growing season, and 1.0 acre classified as farmland of statewide importance within the Proposed Route.

Table 28: Prime Farmland Classifications within HVTL Proposed Route

Farmland Classification	Acreage¹	Percent of HVTL area
Prime Farmland	33.8	64.0%
Prime Farmland if Drained	15.7	30.0%
Prime Farmland if Protected from Flooding	2.3	4.0%
Farmland of Statewide Importance	1.0	2.0%
TOTAL	52.7	100%
¹ The Proposed Route includes the 150-foot right-of-way (75 feet on both sides of the transmission line centerline) for a total of 52.7 acres. Construction is anticipated to impact only 25 feet on both sides of the transmission line centerline for a total of 17.4 acres. The remaining 35.3 acres allows for design flexibility, provides space to maneuver construction vehicles, provides for Minimum Vegetation Clearance Distances per NERC Reliability Standards, and provides a buffer for line sway on windy days. Note: The total shown in this table may not equal the sum of addends due to rounding.		

Of the soil characteristics included in Tables 27 and 28, the characteristics most applicable for an assessment of the Project’s potential to impact soils during construction and operation are prime farmland, farmland of statewide importance, and whether soils within the Proposed Route are prone to compaction. Compaction-prone soils, particularly within agricultural fields, may require additional mitigation measures during construction to minimize compaction and/or additional protocols during restoration of Project workspaces.

According to the SSURGO database, there are 6.8 acres of soils that are highly erodible from water within the Solar Facility, which includes 1.42 acres along the proposed access roads, 0.7

acre along the buried electrical collection lines, 4.66 acres within the fenced area, and less than 1 percent within the stormwater basins. There no highly erodible soils from wind in the Project Area, and there no highly erodible soils within the Proposed Route. Because of their relative scarcity within the Project Area, these soil characteristics are not likely to influence the overall impact of the Project on soils. For this reason, these characteristics are not discussed further in this Application.

Impacts and Mitigation

Solar Facility

Impacts to soils will occur during the construction and decommissioning stages of the Solar Facility. Because the Solar Facility location is on rolling hill topography in existing agricultural fields, construction will require grading to provide a level surface for the solar arrays. Primary impacts to soils that are anticipated include compaction from construction equipment, soil profile mixing during grading and pole auguring, rutting from tire traffic, drainage interruptions, and soil erosion.

Potential impacts to soils would be mitigated through the proper use and installation of BMPs such as using soil ripping equipment to decompact soils following construction, separating and stockpiling topsoil for later spreading and seeding to prevent topsoil mixing with subsoils, halting construction during wet weather conditions to prevent soil rutting from equipment tires, and avoiding and repairing drain tiles to maintain proper site drainage. The Applicant will also develop a SWPPP that complies with MPCA rules and guidelines. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.

Grading activities with the greatest potential to affect topsoil conditions is likely to be grading for the solar arrays, construction of access roads, and the Project Substation. Calculations completed for the anticipated Development Area estimate roughly 937 acres of grading and 728,525 cubic yards of cut and fill. This represents about 60 percent of the anticipated Development Area that will require grading.

Because the Solar Facility will result in a temporary land use with minimal loss of soils, significant changes to future agricultural production are not expected following decommissioning of the Solar Facility. Landowners have been compensated based on the value of the Prime Farmland.

Additionally, the Applicant has prepared a detailed AIMP (Appendix D) and a separate VMP (Appendix E) outlining how soils and vegetative cover will be managed during and after construction for preservation of soils and wildlife habitat enhancement.

HVTL

During construction of the HVTL, a small portion of prime farmland will be temporarily taken out of agricultural production for temporary workspace associated with erecting structures along the right-of-way. As discussed in Sections 5.1.4 and 5.3.2, the footprint of each structure measures approximately 3 to 6 feet in diameter and will permanently impact prime farmland but will not have a meaningful effect on the availability of prime farmland within the state of Minnesota or within Dodge and Olmsted counties.

During construction of the HVTL, soil compaction and localized soil erosion may occur during clearing and grading of work areas. In addition, potential soil impacts may result from the excavation, stockpiling, and redistribution of soils. The Applicant will implement measures to reduce soil compaction and will commit to decompaction of soils during restoration of Project workspaces. Impacts to soils would be temporary and minor and would be mitigated through the proper use and installation of BMPs, such as minimizing the number of vehicles and protection and maintenance of topsoil, during right-of-way clearing and generation tie line construction. Byron will also develop a SWPPP that complies with MPCA rules and guidelines; implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.

Landowners will be compensated accordingly for any localized crop damage and soil compaction that may occur. Refer to Section 6.3.1 for additional information related to agricultural impacts.

6.6.5 Surface Waters and Floodplains

6.6.5.1 Wetlands and Watercourses

According to the National Hydrography Dataset (NHD), ten watercourses and one waterbody are within the Solar Facility site. The Transmission Line route includes four NHD flowlines that includes Cascade Creek and unnamed tributaries to Cascade Creek. No waterbodies were identified within the Proposed Route. No MNDNR PWI watercourses were identified within the Solar Facility or Proposed Route.

According to the National Wetlands Inventory (NWI), 37 wetlands are within the Project Area. Seven wetlands are present within the Proposed Route. Most of these consist of wetlands classified as freshwater emergent or riverine.

Other surface water resources within 1 mile of the Solar Facility and Proposed Route include five MNDNR Public Watercourses located to the south, east and northwest. No rivers or lakes were identified, and no designated trout streams, MN DNR Public Waters Inventory (PWI) basins, or MNDNR-designated shallow lakes or calcareous fens were identified within the Project Area. No impaired waterbodies were identified within the Project Area. Two impaired waterbodies are located within a 1-mile buffer of the Project Area. Additional details on impaired waterbodies are presented in section 6.6.5.3.

A desktop historical aerial photo review was conducted to identify wetlands and watercourses within the Project Area in accordance with the July 1st, 2016 Minnesota BWSR/USACE-accepted protocol for conducting off-site wetland determinations, *Guidance for Offsite Hydrology/Wetland Determinations*. The potential for wetlands within the Project Area was further evaluated by reviewing other desktop resources (i.e., recent aerial photography, hydric soils map units, LiDAR, and digital elevation models). 45 suspect wetlands were desktop delineated totaling 81.9 acres. Desktop delineated suspect wetlands comprise approximately 5 percent of the Project Area and transmission line corridor. The desktop analysis was used to support field delineation efforts.

Jurisdictional field delineations of the Solar Facility and Proposed Route right-of-way were conducted the week of October 26, 2020 and April 26, 2021 (Appendix K). Twenty-five wetlands totaling 22.10 acres, one pond totaling 0.30 acre, and five watercourses totaling 1.58 acres (0.59 linear mile) were delineated. Many of the suspect wetland areas identified during the desktop

mapping exercise were determined to be drained. The delineated watercourses and wetlands are summarized in Table 29 and shown on Map 13.

Table 29: Field Delineated Wetlands and Watercourses

Feature ID	Feature Type	Mapped Type	Acres
Wetlands			
WB-01	Seasonally Flooded Basin	PEM1Af	0.11
WB-02	Fresh Wet Meadow	PEM1B	4.26
WB-03	Fresh Wet Meadow	PEM1B	0.02
WB-04	Fresh Wet Meadow	PEM1B	0.01
WB-05	Sedge Meadow	PEM1B	2.00
WB-06	Fresh Wet Meadow	PEM1B	0.05
WB-07	Fresh Wet Meadow and Sedge Meadow	PEM1B	2.48
WB-08	Fresh Wet Meadow	PEM1B	0.66
WB-09	Seasonally Flooded Basin	PEM1Af	0.44
WB-10	Seasonally Flooded Basin	PEM1Af	0.14
WB-11	Seasonally Flooded Basin	PEM1Af	0.08
WB-12	Seasonally Flooded Basin	PEM1A	0.34
WB-13	Seasonally Flooded Basin	PEM1A	0.01
WB-14	Fresh Wet Meadow	PEM1B	4.31
WB-15	Seasonally Flooded Basin	PEM1Af	2.07
WB-16	Seasonally Flooded Basin	PEM1A	0.08
WB-17	Fresh Wet Meadow	PEM1B	1.69
WB-101	Fresh Wet Meadow/Shallow Marsh	PEM1B/PEM1C	0.47
WB-102	Seasonally Flooded Basin	PEM1Af	0.13
WB-103	Fresh Wet Meadow	PEM1B	2.04
WB-104	Seasonally Flooded Basin	PEM1Af	0.26
WB-105	Seasonally Flooded Basin	PEM1Af	0.22
WB-106	Seasonally Flooded Basin	PEM1Af	0.13
WB-107	Seasonally Flooded Basin	PEM1Af	0.07
WB-108	Seasonally Flooded Basin	PEM1Af	0.05
P-01	Shallow Open Water	PUBGx	0.30
Total			22.40

Table 29: Field Delineated Wetlands and Watercourses

Feature ID	Feature Type	Mapped Type	Acres
Watercourses			
WC-01	Perennial	R2UBH	1.48
WC-02	Perennial	R2UBH	0.01
WC-03	Intermittent	R4SBC	0.05
WC-04	Intermittent	R4SBC	0.02
WC-05	Perennial	R2UBH	0.02
Total			1.58

Impacts and Mitigation

Solar Facility

Potential temporary impacts to wetlands and watercourses within the Solar Facility may include excavating and backfilling associated with the installation of electrical collection lines and clean fill to support temporary access roads during construction of the Project. Permanent impacts may result if direct-embedded piers require concrete foundations to address problematic soil conditions and from the establishment of permanent access roads for operations and maintenance of the Project. Permanent impacts may also be necessary to facilitate fence and wet sedimentation installation. In both cases, soils and vegetation within the wetland and/or watercourse would be disturbed.

The Solar Facility will be designed to avoid and minimize impacts to wetlands and watercourses to the extent practicable. The anticipated Development Area project layout mostly avoids permanent impacts to delineated wetlands. It should be noted that the design is preliminary and engineering or other constraints could make it necessary to adjust the design; however, the intent is to avoid wetland impacts to the extent practicable if modifications become necessary. In such a case, it is anticipated, based on existing size of wetlands identified, and location, that any unavoidable wetland impacts would be minor in nature.

Access roads and structures will be sited to completely avoid permanent direct impacts to wetlands when possible. The driven piers used to support the solar arrays and inverter skids are not anticipated to result in a loss of wetland under the Minnesota Wetland Conservation Act (WCA) as they would not alter the wetland's cross-section or hydrological characteristics, obstruct flow patterns, change the wetland boundary, or convert the wetland to non-wetland (Minn. R. 8420.0111, subps. 26 and 32). Further, the driven piers are not expected to constitute wetland fill under Section 404 of the Clean Water Act (CWA) as they are likely to fall under a structural discharge activity of the USACE Utility Regional General Permit (RGP)-003.

The Project has been designed in a manner to avoid and minimize impacts to identified water resources to the extent practicable. Currently some project facilities are located within delineated wetlands. These areas are likely to be avoided by final project design. An area has also been identified where underground collection facilities will intersect with a non-DNR PWI stream to connect the solar panels to the Byron Substation. Impacts related to this collection crossing are anticipated to be minor. Collection will either be trenched, ploughed or directional bored depending upon depths of water in the channels at the time the construction work is performed. Impacts are anticipated to not exceed de minimis exemption thresholds under the Minnesota WCA and qualify for a USACE Utility Regional General Permit. A permit from

wetland regulatory agencies would likely only be required if trenching or ploughing installation techniques are used during construction. Additional details regarding collection line crossings are presented in Appendix G. All potential temporary impacts to wetlands and/or watercourses would be fully restored to existing grades and vegetated with an appropriate seed mix. Potential permanent impacts to wetlands and/or watercourses exceeding de minimis thresholds would be replaced in accordance with state and federal regulations.

HVTL

No surface water impacts are currently proposed for the construction of the Transmission Line. All pole structures have been sited outside of delineated wetlands and the watercourse. Some temporary impacts may be required in the form of matting across wetlands to access the proposed pole structure locations. All impacts related to construction matting are expected to be minor.

6.6.5.2 Floodplains

Based on the Federal Emergency Management Agency (FEMA) data for Dodge and Olmsted counties, the Solar Facility is located outside of the 100-year FEMA flood zone.

The Proposed Route right-of-way crosses 6.9 acres of FEMA-designated 100-year floodplain areas associated with Cascade Creek in Dodge and Olmsted counties. This represents about 13 percent of the Proposed Route's total right-of-way. Floodplains are shown on Map 6.

Impacts and Mitigation

Solar Facility

The Solar Facility will not impact FEMA-mapped floodplains. Solar project infrastructure has been sited completely outside of mapped FEMA flood zones, including the Project Substation and O&M Facility.

HVTL

The HVTL may require approximately 3 pole structures to be placed within FEMA designated 100-year floodplain areas. The placement of pole structures in floodplains is not anticipated to alter the flood storage capacity of the floodplain based on the minimal size of individual pole structure foundations. While unique design considerations are not anticipated currently for these 3 pole locations, additional geotechnical and hydrological studies along the ROW may inform final engineering and design. The Applicant will work with Dodge County to permit structures that may be located within floodplains.

6.6.5.3 Water Quality

The proposed Solar Facility and Proposed Route do not cross any MPCA identified impaired waters. Two impaired waters were identified within 1 mile south of the Solar Facility. The features are identified as Salem Creek (AUID: 07040004-503) which is listed as impaired for aquatic life, aquatic recreation, and invertebrate bioassessments, and an unnamed tributary to Salem Creek (AUID: 07040004-595) which is listed as impaired for aquatic recreation. A Total Maximum Daily Load (TMDL) has been approved for Fecal Coliform for both features.

Minnesota designates some surface waters as outstanding resource value waters (ORVWs) because of their exceptional qualities. As specified in Minnesota Rules, wild, scenic, and

recreational river segments comprise a part of the definition of ORVWs. The Solar Facility and Proposed Route right-of-way do not cross any ORVWs.

Impacts and Mitigation

Solar Facility and HVTL

Potential impacts to water quality associated with the Solar Facility and HVTL primarily includes sedimentation to nearby wetlands and watercourses such as Salam and Cascade Creeks during construction and operation. A SWPPP will be developed for the Project prior to construction that will include BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent sediment from entering into waterbodies. Because the Solar Facility is located within 1 mile of an impaired water, the Applicant will submit the SWPPP to the MPCA to obtain coverage under the NPDES/SDS Construction Stormwater General Permit at least 30 days prior to construction.

Temporary construction impacts will be avoided and minimized by using BMP's that include temporary construction mats for work in wetlands, directional bores under wetlands, as necessary, for the installation of electrical collection lines, and other erosion control measures identified in the MPCA Storm Water Best Management Practices Manual, such as using silt fencing to control sediment runoff to adjacent water resources. Disturbed surface soils will be stabilized at the completion of the construction process to minimize the potential for subsequent effects on surface water quality and to mitigate disturbances. Construction operations will be designed and controlled to minimize and prevent material discharge to nearby wetlands.

Additionally, the Applicant has prepared a Stormwater Management Study to inform the design of multiple stormwater drainage basins within existing low-lying areas to control runoff into surrounding natural waterbodies during rain events. Wet sedimentation basins are proposed as infiltration and filtration basins were determined unworkable due to soil conditions. These basins will provide rate control and treatment as needed to meet the requirements of the MPCA.

6.6.6 Vegetation

Most of the Solar Facility is within the Rochester Plateau Subsection of the Paleozoic Plateau Section of the Eastern Broadleaf Forest Province. The northern portion of the Solar Facility and the Proposed Route are within the Oak Savanna Subsection of the Minnesota and Northeastern Iowa Morainal Section of the Eastern Broadleaf Forest Province (MNDNR, 1999). The Rochester Plateau Subsection consists of a series of Des Moines lobe end moraines and is a gently rolling glacial till plain covered by loess (MNDNR, 2021b). Presettlement vegetation was tallgrass prairie and bur oak (*Quercus macrocarpa*) savanna. Most of the Oak Savanna Subsection is rolling plain of loess-mantled ridges over sandstone and carbonate bedrock and till. Pre-European settlement vegetation was dominated by bur oak savanna interspersed with tallgrass prairies and maple (*Acer* spp.) -basswood (*Tilia* spp.) forests (MNDNR, 2021c). NLCD land cover type acreages are provided in Table 20.

The Project is located within a rural landscape, and therefore the primary land use in the Project Area is agricultural (96.9 percent; Table 20; Map 10). The remainder of the Project Area consists of hay/pasture and herbaceous lands (1.6 percent) and a small amount of developed lands (1.3 percent). The remaining identified land uses include a minor amount of deciduous forest, comprised of less than 0.1 percent. Forested land within the Project Area is located along hedge rows and farmsteads. Based on the wetland delineation discussed in Section 6.6.5, a total of 25 wetlands, one pond, and five watercourses have currently been delineated (Map 13); the remainder of the Project

Area was field delineated in spring 2021. The wetlands that were identified within the Project Area are seasonally flooded basins, fresh wet meadows, sedge meadow and open water pond. The waterways are intermittent and perennial streams. No native prairies or sensitive plant species were identified within the Solar Facility or the along the HVTL route during routine field surveys.

Impacts and Mitigation

Solar Facility

As discussed in Section 6.6.4, agricultural land within the anticipated Development Area will be converted from an agricultural use to solar energy use for the life of the Project, and the soils given the opportunity to rest and regenerate. Conversion of existing vegetation will be limited as most of the land within the anticipated Development Areas is currently tilled on an annual basis for row crops. Agricultural land within the anticipated Development Area will be seeded with herbaceous vegetation with the exception of the Project Substation, O&M Facility, inverter skids, and access roads, which will be converted to developed land and impervious surfaces (Map 3). Additionally, the Applicant has designed the Project to avoid tree clearing to the greatest extent practicable.

The non-impervious portions of the Project will be seeded with a low-growing vegetation mix within the module footprint, taller vegetation in the open areas between fences and arrays, and vegetation tolerant of wet conditions for any wetlands or areas anticipated to hold water. The seed mixes are developed to achieve the Applicant's goals for operating the Solar Facility, promoting pollinator habitat, establishing stable ground cover, reducing erosion and runoff, and improving infiltration.

As described in Section 3.1.3.2, the Applicant has developed a Project-specific VMP with the intent of establishing objectives surrounding vegetation installation, monitoring, and adaptive management (Appendix E). Custom seed mixes, to be developed, will be planted after solar equipment has been installed. Details for planting will be described in the VMP. These seed mixes are designed to be used with the vegetation management practices of mowing, grazing, and selective herbicide application.

HVTL

Similar to the Solar Facility, the HVTL is sited primarily on tilled, agricultural lands with the exception of the few locations where the route crosses roadway drainage ditches and spans a railroad right-of-way. The corridor does not contain significant trees, shrubs, or other vegetation that will be impacted during construction of the HVTL and installation of the steel monopoles. Delineated wetlands located within the HVTL route are routinely farmed and therefore void of significant vegetation. Because the HVTL route is situated in predominantly agricultural fields, significant impacts to vegetation during construction is not anticipated and no mitigation is proposed outside of normal erosion control BMPs and standard revegetation practices as outlined in the Project's SWPPP.

6.6.7 Wildlife

Wildlife within and near the Project Area can generally be separated into avian species and other wildlife taxa including reptiles, mammals, and insects. Based on the Breeding Bird Survey (Pardiek et. al., 2020) and the last four years of the Rochester Christmas Bird Count (3.2 miles east) up to 146 bird species occur in Dodge County annually (National Audubon Society, 2020). The 146 bird species are comprised of resident and migratory species. Migratory birds are

federally protected under the Migratory Bird Treaty Act (MBTA), and bald eagles (*Haliaeetus leucocephalus*) are protected under the MBTA and Bald and Golden Eagle Protection Act (BGEPA) (USFWS, 2007 and 2018a). The MBTA protects migratory birds and most resident birds that are native to the U.S. from impacts and take. 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 (USFWS, 2007). 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 (USFWS, 2007).

The Project Area is located within the Eastern Tallgrass Prairie Bird Conservation Region (BCR). The USFWS identified 39 species of birds within Eastern Tallgrass Prairie BCR as Birds of Conservation Concern (BCC); BCC are avian species that represent the USFWS's highest conservation priorities as they are species that are considered to be at risk of becoming candidates for listing under the federal Endangered Species Act (ESA) without conservation efforts. Some of the BCC in the Eastern Tallgrass Prairie BCR include the bald eagle, American bittern (*Botaurus lentiginosus*), black rail (*Botaurus lentiginosus*), upland sandpiper (*Bartramia longicauda*), red-headed woodpecker (*Melanerpes erythrocephalus*), black-billed cuckoo (*Coccyzus erythrophthalmus*), blue-winged warbler (*Vermivora cyanoptera*), grasshopper sparrow (*Ammodramus savannarum*), loggerhead shrike (*Lanius ludovicianus*) and dickcissel (*Spiza americana*) (USFWS, 2008).

The USFWS is also concerned about avian species that are at risk of population-level declines resulting from habitat fragmentation. Species of habitat fragmentation concern are impacted when large areas of habitat are divided into smaller areas with concomitant reductions in habitat connectivity (USFWS, 2012). At present, the Project Area is largely disturbed as 96.9 percent of the Solar Facility and HVTL Route right-of-way are used for agriculture purposes or are developed (e.g., existing roads, railroad, farmsteads, etc.).

Forested land within the Project Area is limited (less than 1.8 percent) and is largely restricted to hedge rows and farmsteads. As a result, few migratory bird species that use trees or forested areas as habitat will be present, such as bald eagle and red-headed woodpecker. According to land cover data, there are no forested areas within the Project Area. Open water habitats are similarly limited within the Project Area. As such, it is unlikely that many water-dependent birds (e.g., waterfowl or shorebirds) would use the Project Area for nesting or roosting purposes. Species of migratory birds associated with grasslands are also anticipated to be limited or absent. It is unlikely that land cover within the Project Area provides suitable habitat for most BCCs.

In addition to birds, other wildlife taxa that may occur in the Project Area include mammals, reptiles, and insects. Mammals that may occur within the Project Area include white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and coyote (*Canis latrans*). Reptiles that may occur in the Project Area include the plains gartersnake (*Thamnophis radix*), and common gartersnake (*Thamnophis sirtalis*). Watercourses within the Project Area are limited to five intermittent and perennial streams (see Section 6.6.5 and Map 13). Small disturbance-tolerant fish or mollusks could be present within the Project Area. Some pollinator insects may be present in the Project Area including native bees, butterflies, and moths.

Impacts and Mitigation

The current understanding of wildlife PV-solar interactions is limited, but impacts are believed to include exclusionary fencing, habitat destruction and alteration, and direct mortality

(summarized by Chock et al., 2020). Exclusionary fencing, mostly affecting non-avian species, impedes movements of animals that are too large to pass through the fencing or are unable to fly over the fencing. Habitat alteration resulting from the construction of PV-solar facilities typically occurs when the vegetation within a site is changed from row-crop agriculture to native perennial herbaceous vegetation. Direct PV-solar facility related mortality of wildlife species has been attributed to a variety of sources including direct impacts (i.e., collisions with infrastructure [birds and bats]), entrapment (i.e., soil ruts from vehicles or evaporation ponds [birds, mammals, insects, amphibians, and reptiles]), and electrocution (i.e., overhead lines [birds]) (summarized by Chock et al., 2020). Although PV-solar related impacts have been identified for a variety of wildlife taxa, impacts to bird species has received the greatest attention.

Direct impacts to birds, including waterbirds, are limited in absolute numbers and in relative numbers for PV-solar facilities compared to other anthropogenic sources (i.e., collisions with buildings, etc.) (Loss et al., 2015). By prioritizing the use of land currently in agricultural production for the Project footprint, implementing a ground cover strategy with a diverse plant community, and employing appropriate BMPs, the potential for indirect effects to birds will be minimized at the Project.

Direct effects to birds at PV solar facilities have been described as apparent collisions with the fixed structures of the facilities (Walston et al., 2016). However, there is evidence that many of the recorded bird fatalities were indicative of predation or even preening (i.e., feather-spots), and were not collision related (Kosciuch et al., 2017). The published literature on avian collisions with fixed PV solar infrastructure is limited to a few studies in regions of the world substantially more arid than Minnesota (H.T. Harvey and Associates, 2015; Visser et al., 2019; Western Ecosystems Technology, Inc., 2014). These studies suggest direct impacts to birds were limited and mostly (about 85 percent) comprised of passerine (perching bird) species. Although passerines appear to account for most solar-related bird fatalities, waterbirds often receive a disproportionate amount of attention due to a lake effect hypothesis that posits waterbirds are at a risk of collision due to their misinterpretation of PV-panel arrays as a waterbody. However, to date there does not appear to be a consistent pattern of waterbird fatalities to support the lake-effect hypothesis.

Even with conservative inclusion of the bird fatalities attributed to background influences such as predation events, adjusted bird fatality estimates from the studies were low compared to other anthropogenic sources of avian mortality (i.e., vehicle-and building-collisions) with reported annual average bird fatality rates ranging from 1 to 3 birds/MW/year for solar facilities (Walston et al., 2016). The total range of statistical variability around reported bird fatality estimates, ranged from 0.5 to 10.0 birds/MW/year (H.T. Harvey and Associates 2015; Visser et al., 2019; Walston et al., 2016). Walston et al. (2016) estimated total annual bird mortality for solar energy facilities (included PV and concentrated solar power tower facilities) in the United States to be 37,800 – 138,600 per year. None of the studies suggest that PV solar facilities present a risk to any species populations. For context, various studies summarized by Walston et al. (2016) estimated that, annually, between 97 and 988 million birds die from building and window strikes, and 80 to 340 million die from vehicle collisions.

The indirect effect to birds of PV solar facility, as with other development, primarily includes habitat loss, fragmentation, or degradation of suitable habitat (Multiagency Avian-Solar Collaborative Working Group, 2016). It is generally considered a BMP to site development in a way that minimizes loss of undisturbed or high-quality habitats, as has been done for the

Project. Agricultural row crop areas are generally considered of lower ecological value compared to undisturbed, native habitats or semi-natural habitats (e.g., cover crops [Wilcoxon et al., 2018]) or CRP lands (Johnson, 2000). Best et al. (1995) assessed habitat use by breeding birds in Iowa agricultural landscapes and found the lowest bird species abundances in agricultural habitats, and greater bird species abundances in natural and strip-cover habitats.

The replacement of monocultural row crops with a higher diversity plant community under and around PV-array fields as proposed by the Applicant will, for some bird species, increase the attractiveness of the land to individual birds. For example, though different habitat types were evaluated, Visser et al. (2019) and Devault et al. (2014) found that some bird species used PV facilities to the same degree or more than the surrounding, undeveloped lands. By prioritizing Project disturbance to lands in active agriculture and minimizing disturbance in existing non-agricultural or natural habitats, and by implementing the proposed ground cover strategy, the Applicant will mitigate impacts to birds due to loss of the pre-construction land cover.

Impacts to wildlife are expected to be minimal. The proposed establishment of stable, year-round herbaceous cover post-construction will likely benefit many wildlife species (i.e., ground-nesting birds, pollinators, et cetera.). Common species of wildlife adapted to agricultural land use may be present in the Project Area such as white-tailed deer, red fox, striped skunk, wild turkey (*Meleagris gallopavo*), ring-necked pheasant (*Phasianus colchicus*), and an array of passerines, rodents, and insects. During Project construction, wildlife within the Project Area are likely to be temporarily displaced; however, as the current land use within the HVTL Route right-of-way is predominately agricultural, and surrounding land use is rural residential and commercial, these species would be impacted by human activity regularly. Overall, construction of the Project is expected to minimally impact wildlife or their populations. During operations, any potential impacts to wildlife are also expected to be minimal (e.g., excluding large mammals from site access from fencing). As the potential impacts to wildlife are anticipated to be minimal or temporary, no species-specific mitigation is proposed.

The potential for bird collision with the overhead transmission line would depend on the line's location. 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. Collision risk may increase if a power line bisects daily movement corridors (such as between roost, feeding, or nesting areas).

Electrocution risk is minimized with the 345 kV transmission line, based on the increase in horizontal space between lines when compared with smaller transmission lines (APLIC, 2006). To reduce the potential for avian collisions or exposure during line operation, the Applicant will consider implementing measures to increase overhead shield wire and other suggested practices outlined by APLIC's collision manual (APLIC, 2012).

6.6.8 Rare and Unique Natural Resources

The USFWS Information for Planning and Consultation (IPaC) database was reviewed for the potential occurrence of federally listed species, candidate species, or designated critical habitat that may occur within or near the Project Area (USFWS, 2021a). MNDNR's Natural Heritage Information System (NHIS) documents occurrences of federal or state listed species, state Species of Concern, and rare habitat. A data request for records within a 1-mile buffer of the Solar Facility and Proposed Route was submitted on March 10, 2021 and is currently pending. Although these reviews do not represent a comprehensive survey, they provide information on the potential presence of protected species and habitat within the vicinity of the Project (refer to Table 30). A copy of this request is included in Appendix C.

6.6.8.1 Federally Listed Species

According to the USFWS IPaC (2021), three federally listed species may occur within or near the Project Area: the federally threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), Leedy's roseroot (*Rhodiola integrifolia ssp. leedyi*), and prairie bush-clover (*Lespedeza leptostachya*). The USFWS's (2016) final 4(d) rule for NLEB limits prohibitions for the incidental take of the species to those that would protect the bat in white-nose syndrome (WNS)-affected areas. The Project Area is located within the USFWS-designated WNS Zone (USFWS, 2020). Also, although not identified in the USFWS IPaC (2021) the federally endangered rusty patched bumble bee (RPBB) (*Bombus affinis*) has potential to occur within the Project Area based on the Low Potential Zone that extends into the Project Area, as identified by the USFWS (2018b) RPBB habitat connectivity model. These species are further discussed below.

Northern Long-eared Bat

The NLEB is listed as threatened under the federal ESA, due to population-level declines primarily due to a fungal infection that manifests as WNS. NLEB occur throughout the eastern and central U.S. (Caceres and Barclay, 2000). The annual life history of the NLEB includes an inactive hibernation period and an active period when the species forages and raises offspring. Hibernation typically occurs in caves and mines from November 1 to March 31 (USFWS, 2015 and 2016). In April, the species emerges from its hibernacula and migrates to summer habitat. Adult females form maternity colonies in trees (Caceres and Barclay, 2000; Wisconsin Department of Natural Resources, 2017). No known hibernacula or maternity roost trees have been documented in Dodge or Olmsted counties (MNDNR and USFWS, 2020). A review of the MNDNR NHIS licensed data did not indicate NLEB species occurrences within or near the Project Area. During the summer, the species roosts in live or dead trees ≥ 3 inches in diameter at breast height (dbh) in cavities, crevices, or beneath sloughing bark (Timpone et al., 2010). NLEB forage in forested areas or along edge habitats (USFWS, 2015).

While the Project Area is primarily agricultural lands with only a small area of forested habitat, adjacent landscape surrounding the Project Area includes riparian corridors (Map 10); therefore, the probability of NLEB occurrence within the Project Area is moderate.

Rusty Patched Bumble Bee

The primary threats to RPBB populations include habitat loss and degradation and the intensification of farming practices (USFWS, 2017).

The USFWS (2018b) adapted a habitat connectivity model to identify the zones around current (2007-2017) records. The model produces discrete zones where there is a potential for the species to be present. The zones are referred to as High Potential Zones or Low Potential Zones. High Potential Zones contain extant sites and the surrounding area and are considered to have greatest potential for species presence. Low Potential Zones include Primary Dispersal Zones, which models the maximum dispersal potential of the species from sites with recent records surrounding High Potential Zones, which assumes the presence of species where suitable habitat is present; and Uncertain Zones, which contain the maximum dispersal potential from historic records of the species observed between 2000 and 2006.

RPBB have been observed and collected in a variety of habitats including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens (Colla and Dumesh, 2010; Colla and Packer, 2008). The RPBB requires areas that support sufficient food (nectar and pollen

from diverse and abundant flowers), undisturbed nesting sites in proximity to floral resources, and overwintering sites for hibernating queens (Goulson et al., 2015; Potts et al., 2010). Nesting sites include underground and abandoned rodent cavities or clumps of grass, and overwintering sites include patches of undisturbed soil (USFWS, 2017).

As the Project Area is primarily agricultural lands with only a small area of forested habitat (less than 1 percent) and herbaceous habitat (2.3 percent), and the landscape surrounding the Project Area is dominated by agriculture (Map 10), the probability of RPBB occurrence within the Project Area is low.

Leedy's Roseroot

Leedy's Roseroot grows in only four areas in Minnesota and two areas in New York; one of those areas is in Olmsted County, Minnesota (USFWS, 1993). The primary threat to Leedy's roseroot is ground water contamination from pesticides and fertilizers, and changes in hydrology (USFWS, 1993).

This species grows in a very specific and rare habitat, called a maderate cliff, which is characterized by the cracks in the cliff that extends from the cliff face to underground caves (USFWS, 1993). Leedy's roseroot grows near these cracks, where the cool air escape from the underground caves. As the Project Area is primarily agricultural lands with relatively flat topography (Map 10), the probability of Leedy's roseroot occurrence within the Project Area is low.

Prairie Bush-Clover

The primary threats to prairie bush-clover include loss of tallgrass prairie habitat and the intensification of farming practices (USFWS, 2009). Prairie bush-clover is found today in only four states, in scattered prairie remnants (USFWS, 2009; MNDNR, 1990). It prefers mesic prairies with damp to dry soils.

As the Project Area is primarily agricultural lands with only a small area of herbaceous habitat (1.6 percent), and the landscape surrounding the Project Area is dominated by agriculture (Map 10), the probability of prairie bush-clover occurrence within the Project Area is low.

Impacts and Mitigation

Potential impacts to the rare and unique natural resources described above include incidental take of NLEB predominately through tree removal, and physical habitat disturbance during construction for RPBB, Leedy's roseroot, and prairie bush-clover. The USFWS (2016) final 4(d) rule for NLEB limits prohibitions for the incidental take of the species to those that would protect the bat in WNS-affected areas. The Project Area is located within the USFWS-designated WNS Zone (USFWS, 2020). Per the USFWS (2016) Final 4(d) rule for NLEB, within the WNS Zone, incidental take due to tree removal is prohibited as follows:

- If it occurs within 0.25-mile (0.4 kilometer) of a documented hibernaculum; or
- If it involves a documented maternity roost tree or other trees within 150 feet (47 meters) of the documented maternity roost tree during June or July.
- In addition, all take within known hibernacula is prohibited.

According to the MNDNR and USFWS (2020) there are no known hibernacula or roost trees in Dodge or Olmsted counties; however, the species may still occur within or near the Project Area. The Byron Solar Project determination (USFWS 2021c) indicated that the Project may affect

NLEB, however, the Project layout has been designed to avoid the removal of trees during Project construction. Any tree clearing that might be required would be accomplished outside of the NLEB pup-rearing season. Therefore, the Applicant determined the Project is No Effect for northern long-eared bat based on little to no tree clearing and any necessary tree clearing occurring outside of NLEB pup-rearing season.

There is approximately 205 acres of Low Potential Zone mapped within the Project Area and 6,060 acres mapped within the 1-mile buffer. However, as the Project Area is predominately agricultural land, it is unlikely that RPBB will be impacted by Project construction or operation.

Leedy's Roseroot is not anticipated to occur within the Project Area due to the lack of moderate cliff habitat. Therefore, no impacts are anticipated. Similarly, no impacts to prairie bush clover are expected during Project construction or operation as no tallgrass prairie habitat has been identified within the Project Area. There is no online determination tool for prairie bush clover or Leedy's roseroot impacts.

6.6.8.2 Stated Listed Species

A record of one state-special concern vascular plant, one state-endangered vertebrate animal, two state-threatened vertebrate animals, three state-special concern vertebrate animals, and one state-threatened invertebrate animal was documented within one mile of the Solar Facility and proposed HVTL Route (Table 30). These records were reviewed using a 2020 MNDNR data request and internal MNDNR NHIS database license LA-980 (2021); a 2021 MNDNR NHIS data request is pending (Appendix C).

American Ginseng

American ginseng (*Panax quinquefolius*) is found in upland hardwood forests dominated by sugar maple (*Acer saccharinum*), American basswood (*Tilia americana*), or red oak (*Quercus rubra*) (MNDNR, 2018). This plant grows only in well-developed forests soils that are typically a mesic loam (MNDNR, 2018). No tracts of mature upland forest were observed onsite during field studies.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a small predatory songbird that inhabits short, open, upland grassland with hedgerows, isolated shrubs, and trees (MNDNR, 2018). Listed as state-endangered, the loggerhead shrike's population decline can be at least partially attributed to encroachment of trees on grasslands and intensive row crop agriculture practices (MNDNR, 2018). Although the Project Area is heavily dominated by row crop agriculture, small areas of pasture with scattered oak trees were observed.

Wood Turtle

The wood turtle (*Glyptemys insculpta*) is a largely aquatic reptile that relies upon forested riverine systems, specifically watercourses that are small to medium in size and fast flowing; sandy areas adjacent to watercourses that are not flood prone are especially important for nesting. Factors contributing to population declines include habitat loss and fragmentation, stream siltation, and nest area flooding (MNDNR, 2018). No suitable wood turtle habitat was observed onsite during wetland and watercourse delineations in 2020 and 2021.

Eastern spotted skunk

The eastern spotted skunk (*Spilogale putorius*) can be found in agricultural and open lands that provide adequate cover, such as shelterbelts, woodlands, outbuildings, and other structures (MNDNR, 2018). According to the MNDNR (2018), six eastern spotted skunks have been documented in Minnesota in the last two decades.

North American Racer

The North American racer (*Coluber constrictor*) is an opportunistic forager that can be found in a variety of woodland and grassland habitats; in Minnesota, it is limited to the Minnesota, Mississippi, and St. Croix River Valleys (MNDNR, 2018). Extensive row crop agricultural land use within the Solar Facility and HVTL Route suggests limited habitat is present onsite.

Ozark Minnow

The Ozark minnow (*Dionda nubila*) is found in clean, clear, small to medium sized perennial streams; in Minnesota, populations are restricted to the Zumbro, Root, and Cedar River and their tributaries (MNDNR, 2018). One perennial watercourse (Cascade Creek) within the Zumbro River watershed flows through the Project Area.

Northern Brook Lamprey

The northern brook lamprey (*Ichthyomyzon fossor*) is a small, non-parasitic fish that feeds on detritus, algae, bacteria, and other drifting or suspended nutrients (MNDNR, 2018). Threatened due to habitat degradation and lampricide treatments, this species requires moderately warm, clean, clear streams that are typically 19 meters wide and 0.7 meters deep. Adults prefer swift water flowing over a coarse substrate, while ammocoetes are found burrowed in sediments of slow-flowing side channels (MNDNR, 2018). No suitable streams were observed within the Solar Facility and HVTL Proposed Route during 2020 and 2021 wetland and watercourse delineations.

Ellipse

The ellipse (*Venustaconcha ellipsiformis*) is a freshwater mussel found in the Cannon, Zumbro, Root, Cedar, and Upper Iowa River systems of Minnesota. This species is typically found in gravel riffles of rivers and silty areas of stream banks (MNDNR, 2018). One small, perennial watercourse within the Zumbro River watershed flows through the Project Area.

Table 30: Species Potentially Occurring within the Project Area or within 1 Mile

Common Name	Scientific Name	Habitat	Within 1 Mile	Within Project Area	State	Federal
Birds						
Loggerhead shrike	<i>Lanius ludovicianus</i>	Inhabits short, open, upland grassland with hedgerows, isolated shrubs, and trees (MNDNR, 2018).	Yes	No	E	N/A
Fish						
Northern brook lamprey	<i>Ichthyomyzon fossor</i>	Adults are found in swift water over a coarse substrate; ammocoetes are found burrowed	Yes	No	SC	N/A

Table 30: Species Potentially Occurring within the Project Area or within 1 Mile

Common Name	Scientific Name	Habitat	Within 1 Mile	Within Project Area	State	Federal
		in fine sediment or organic debris associated with quiet water. Requires warm, clean, clear streams typically averaging 19 meters wide and 0.7 meter deep (MNDNR, 2018).				
Ozark minnow	<i>Notropis nubilus</i>	Found in clean, clear, small to medium sized perennial streams; in Minnesota, populations are restricted to the Zumbro, Root, and Cedar River and their tributaries (MNDNR, 2018).	Yes	No	SC	N/A
Mammals						
Eastern spotted skunk	<i>Spilogale putorius</i>	Can be found in agricultural and open lands that provide adequate cover, such as shelterbelts, woodlands, outbuildings, and other structures (MNDNR, 2018).	No	No	T	N/A
Reptiles						
North American racer	<i>Coluber constrictor</i>	Opportunistic forager that can be found in a variety of woodland and grassland habitats; in Minnesota, it is limited to the Minnesota, Mississippi, and St. Croix River Valleys (MNDNR, 2018).	No	No	SC	N/A
Wood turtle	<i>Glyptemys insculpta</i>	Relies upon forested riverine systems, specifically watercourses that are small to medium in size and fast flowing; sandy areas adjacent to watercourses that are not flood prone are especially important for nesting (MNDNR, 2018).	Yes	No	T	N/A
Mussels						
Ellipse	<i>Venustaconcha ellipsiformis</i>	This species is typically found in gravel riffles of rivers and silty areas of stream banks; known to occur in the Cannon, Zumbro, Root, Cedar, and Upper Iowa River systems of Minnesota (MNDNR, 2018).	Yes	No	THR	N/A
Plants						
Prairie bush-clover	<i>Lespedeza leptostachya</i>	Found in dry to mesic tallgrass prairies with gravelly soils (USFWS, 2009).	No	No	T	T
American ginseng	<i>Panax quinquefolius</i>	Found in upland hardwood forests dominated by sugar	Yes	No	SC	N/A

Table 30: Species Potentially Occurring within the Project Area or within 1 Mile

Common Name	Scientific Name	Habitat	Within 1 Mile	Within Project Area	State	Federal
		maple (<i>Acer saccharinum</i>), American basswood (<i>Tilia americana</i>), or red oak (<i>Quercus rubra</i>); grows only in well-develop forests soils that are typically a mesic loam (MNDNR, 2018).				
E = Endangered, T = Threatened, SC = Species of Concern						

Impacts and Mitigation

No impacts to any Minnesota state endangered, threatened, or special concern species are anticipated throughout construction or operation of the Solar Facility and HVTL. Although limited potentially suitable habitat for loggerhead shrike is present within the Project Area, no tree clearing is proposed; if any is required, it will take place outside of the breeding season to avoid any potential take. Similarly, BMP's will be used to avoid siltation, sedimentation, or other impacts to streams or water quality, thus minimizing risk to sensitive aquatic species with potential habitat within the Project Area, such as the ellipse and Ozark shiner. Most species, including American ginseng, prairie bush-clover, wood turtle, North American racer, eastern spotted skunk, and northern brook lamprey are not anticipated to be located within the Project Area due to lack of suitable habitat.

6.6.8.3 Wildlife Action Network and Minnesota Wildlife Action Plan Species

The Wildlife Action Network is comprised of areas with high concentrations or persistent or viable populations of Species of Greatest Conservation Need (SGCN). SGCN are defined as native animals with rare, declining, or vulnerable populations and species for which the state has a stewardship responsibility. Minnesota's State Wildlife Action Plan (SWAP) (2015-2025) proactively addresses the state's conservation needs and catalyzes actions in an attempt to prevent species from needing to be listed under the state's endangered species law (MNDNR, 2016b). No SGCN were documented within the Project Area based on the MNDNR NHIS ER response (ERBD #20200305).

MNDNR High Value Habitats

The MNDNR (2016a) issued a Commercial Solar Siting Guidance (Solar Guidance) that recommends identification of high value resources during Project development. The Solar Guidance indicates that high value habitats include:

1. native plant communities (NPCs).
2. native prairies.
3. habitats included in the Wildlife Action Network and Minnesota Wildlife Action Plan (i.e., Minnesota Biological Survey [MBS], SOBS, Lakes of Biological Significance, and streams with exceptional indices of biological integrity).
4. lakes, wetlands, streams, and rivers.

5. large block habitats (i.e., greater than 40 acres).
6. public conservation and recreation lands (e.g., WMAs, SNAs, etc.).
7. properties in government programs or with conservation easements.

High value habitats in the Solar Facility and Proposed Route are shown on Map 15.

Native Plant Communities

NPCs are groups of native plants that are not greatly altered by modern human activity or by introduction (i.e., non-native species). NPCs are classified in a hierarchical approach based upon 1) vegetation structure and hydrology; 2) ecological processes; 3) climate and paleohistory; 4) local environmental conditions; 5) dominant canopy species, substrate, and fine-scale environmental conditions; and 6) finer-scale descriptions of dominant canopy species, substrate, and fine-scale environmental conditions (Aaseng et al., 2011). There are no NPCs mapped within the Proposed Route right-of-way or Solar Facility. However, there are 19 NPCs mapped within 1 mile of the Solar Facility and 1 NPC mapped within 1 mile of the Proposed Route right-of-way (Map 15). One is identified as southern dry cliff, one is mesic limestone, two are oak-shagbark hickory woodland, two are southern dry-mesic oak forest, three are red oak-white oak (sugar maple) forest, three are southern mesic oak-basswood forest, three are sugar maple-basswood (bitternut hickory) forest, and five are identified as southern wet-mesic hardwood forest. The nearest NPC is a southern mesic oak-basswood forest located 0.08 mile southwest of the Solar Facility, just east of 250th Avenue (MNDNR, 2021h).

Native Prairie

The MNDNR (2016b) defines native prairies as grasslands that have not been plowed that are dominated by prairie plant species. The MBS's railroad prairie rights-of-way are native prairie remnants that occur along railroad rights-of-way. The MBS ranks railroad rights-of-way prairies into three categories: 1) very good, 2) good, or 3) fair. There are no MBS railroad rights-of-way prairies mapped within or within 1 mile of the Solar Facility or Proposed Route right-of-way. The nearest identified native prairie is approximately 2 miles east of the Solar Facility. During desktop and field native prairie reviews, no native prairies were observed within the Solar Facility or Proposed Route right-of-way.

Impacts and Mitigation

The BMPs described in Section 6.6.5.3 will be used to minimize impacts to the wetlands and watercourses within the Solar Facility and Proposed Route right-of-way. No other MNDNR High Value Habitats were identified within the Solar Facility or Proposed Route right-of-way. No native prairies were observed during the native prairie assessment. As such, permanent impacts to MNDNR High Value Habitats will be avoided and no mitigation measures are proposed.

6.6.8.4 Wildlife Action Network and Minnesota Wildlife Action Plan Habitat

The MBS designates and assigns ranks to SOBS based on the presence of NPCs, rare animals and plants, and landscape (i.e., context and ecological function). MBS SOBS are classified as outstanding, high, moderate, or below (MNDNR, 2009). There are no MBS SOBS within the Solar Facility or Proposed Route right-of-way. However, there are five within 1 mile of the Solar Facility (Map 15). They are located south of the Project and all five are considered sites with moderate biodiversity significance. The MBS sites are associated with the 20 NPCs identified in the 1-mile buffer (see above). The Project does not intersect any habitats identified in the Wildlife Action Network.

Lakes, Wetlands, Streams, and Rivers

Lakes, wetlands, streams, and rivers are discussed in section 6.6.5 (Map 13). Ten NHD watercourses and one NHD waterbody are mapped within the Solar Facility. The Proposed Route right-of-way includes four NHD flowlines, including Cascade Creek. No NHD waterbodies were identified within the Proposed Route right-of-way. No MNDNR PWI features were identified within the Solar Facility or Proposed Route right-of-way.

Large Block Habitats

Large block habitats are grassland or woodland areas of greater than 40 acres (MNDNR, 2016b). Land cover within the Project Area has largely been modified for anthropogenic purposes (approximately 97 percent – Map 10). There are no large block habitats within the remaining approximate 3 percent of land cover within the Project Area, and what does remain is less than 40 acres.

Public Conservation and Recreation Lands

Public conservation and recreation lands include lands administered by federal, state, or local agencies, or conservation easements. No public conservation lands are located within or within 1 mile of the Solar Facility and Proposed Route right-of-way (Maps 6 and 9). As discussed in Section 6.2.9, recreational land in the form of a snowmobile trail traverses the Solar Facility.

Properties in Government Programs or with Conservation Easements

Based on the MNDNR (2016a) Solar Guidance, properties in government programs or with conservation easements include MNDNR Native Prairie Bank, Reinvest in Minnesota, Forest Legacy easements, and USFWS or private conservation easements. There are three CRP lands located within the Solar Facility. There are an additional 31 CRP lands within one mile of the Solar Facility. There are no CRP lands within the Proposed Route right-of-way, however there are 5 CRP lands within one mile of the proposed HVTL Route right-of-way. There are no other properties in government programs or with conservation easements in the Project Area or one-mile buffer.

Impacts and Mitigation

Three CRP lands will be impacted by the anticipated Development Area. No MBS SOBS, large block habitats, or public conservation and recreation lands are located within the Solar Facility and Proposed Route right-of-way; therefore, no impacts are anticipated. Regardless, the Applicant will implement a VMP that includes minimizing chemical use in sensitive areas by avoiding broadcast applications of herbicide and employing spot treatments for control of invasive species.

6.7 Cumulative Potential Impacts

Cumulative potential effects result when impacts associated with the proposed Project are combined with impacts associated with past, present, or reasonably foreseeable future actions within the area affected by the proposed Project. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

On June 22, 2021, the Applicant reached out to representatives from Dodge and Olmsted counties in regards to any known development, road, drainage or similar projects planned within close proximity to the Project Area that might interact in such a way as to create cumulative impacts (construction timing, environmental resources, etc.). On June 22, 2021, Olmsted County indicated that Kalmar Township is part of the Township Cooperative Planning Association (TCPA). The TCPA handles all the daily activity, including, but not limited to zoning applications, conditional use permits and variances, and subdivision and platting of land.

Dodge County has one road improvement project scheduled for construction in 2021 as part of the Capital Improvement Plan (Dodge County, 2021). Based on the timeframe and location (nearly 15 miles west of the HVTL crossing over U.S. Highway 14), this project is not likely to impact the Project.

According to MnDOT District 6 (MnDOT, 2021b) and the 10-Year Capital Highway Investment Plan (MnDOT, 2019), two road improvement projects are scheduled to start in 2022, and two projects are scheduled to start in 2023. Based on a Project construction start in 2022, three MnDOT and Olmsted County projects may occur within the same timeframe. MnDOT's U.S. Highway 14 intersection safety improvement and Highway 57 reconstruction projects, and Olmsted County's CSAH 4 and CR 104 reconstruction projects are planned to begin in 2022. Due to the proximity of the U.S. Highway 14 Intersection Safety Improvement project, vehicles using U.S. Highway 14 may experience road closures, delays, or congestion.

Table 31 summarizes the MnDOT, Dodge County, and Olmsted County transportation projects that are in close proximity to the Project Area, and generally occur between 2021 and 2024. Of the transportation projects identified, no projects would be expected to create significant cumulative impacts.

Table 31: Dodge and Olmsted County Transportation Projects

Agency	Planned Construction Start	Description
MnDOT	2022	MnDOT will reconstruct Hwy 57 in Kasson from Dodge CR 34 to 118 St NE and build new roundabouts.
	August to late October 2022	MnDOT evaluated 3 intersections along the U.S. Highway 14 corridor for modifications to improve safety between Rochester and Byron: 1) the intersection with Olmsted County Road 3, 2) Olmsted County Road 44, and 3) the 7th Street NW intersection median is recommended to be closed with this project.
	Summer of 2023	Reconstruction of Hwy 57 from South Branch Middle Fork Zumbro Bridge to 9th Street in Mantorville.
	2023	Installation of a traffic management equipment along 7 miles of Hwy 14 from CR 5 in Byron to west of CR 56 (Dodge Center). This project is about 2 miles west of the HVTL crossing of U.S. Highway 14.
Olmsted County	2021	CSAH 4 reconstruction and CR 105 realignment. About 2.5 miles north of Byron Substation (Olmsted County, 2021b).
	2022	Road improvements on CSAH 4 (Valleyhigh Road NW) and CSAH 44 (CR 104/60th Ave NW). The project is about 6 miles northeast of the Byron Substation (Olmsted County, 2021b).
	Intersection improvements will be phased over a 5-to-20-year timeframe	The U.S. Highway 14 Corridor Analysis is a collaboration between Olmsted County, Dodge County, the cities of Byron and Kasson, and MnDOT, includes 7 intersections along U.S. Highway 14 between Kasson to the CR 104 intersection (east of Byron), (Olmsted County, 2021c).
	2024	Reconstruct CSAH 5 from CSAH 25 to U.S. Highway 14. About 1.2 miles southeast of the Byron Substation (Olmsted County, 2021d).

The Applicant also reviewed the Olmsted County GIS Web App (Olmsted County, 2021a) for future land use and growth management zones. Based on the web map, areas crossed by the HVTL right-of-way remain zoned as A2 – Agricultural. The area surrounding the Byron Substation and east of the Solar Facility in Kalmar Township, Olmsted County, remains agriculturally zoned (with the exception of the City of Byron).

According to communications with the DOC EERA in August 2021, Dodge County Wind, LLC is proposing an approximate 280 MW wind farm with a 161 kV interconnect to the Pleasant Valley Substation (Docket Nos. IP-6981/WS-17-307 and IP-6981/WS-17-307 for the Site Permit and

IP-6981/TL-17-308 for the Route Permit). This proposal replaces Dodge County Wind's previously proposed 170 MW wind farm with a 345 kV HVTL

Additionally, the Applicant reviewed the Minnesota Environmental Quality Board (EQB) Environmental Review Projects Interactive Map to determine if any projects requiring environmental review were scheduled for construction during the Project timeframe. According to the map, there is one environmental review project listed in Olmsted County. The Silver Lake Dredging and Dam Modification Project is located in downtown Rochester and involves several improvements to Silver Lake, including dredging, dam modification, and construction of riffle features to restore river functions on the South Fork Zumbro River (EQB, 2021). Based on the distance and type of project, there will be no cumulative potential effects associated with the proposed Project.

6.8 Climate Change

Executive Order 19-37 (EO 19-37), signed in December 2019, created the Governor's Advisory Council and the Climate Change Subcabinet to coordinate climate change mitigation and resilience strategies in the State of Minnesota. EO 19-37 describes climate change as an existential threat that impacts all Minnesotans and our ability to thrive. It also encourages State leaders and policy makers to consider equity in our States response to climate change (Minnesota EO 19-37, 2019).

The Next Generation Energy Act (NGEA) of 2007 set statutory goals to reduce greenhouse gas emissions in the state by 30 percent of 2005 levels by 2025, and 80 percent by 2050. Minnesota fell short of its 2015 goal of 15 percent and is not on track to meet the 2025 goal. EO 19-37 called for a redoubling of efforts to meet or exceed our NGEA goals and increase community resilience in the face of climate change (MN Exec. Order No. 19-37, 2019).

The Project will further the States' clean energy goals set forth by the Governor's Office by providing a renewable source of energy that will offset other greenhouse gas emissions, primarily from coal and natural gas. The Project will beneficially impact climate change because it will reduce the need for carbon-based electric generation processes, reduce the need for and minimize the proliferation of additional transmission infrastructure, and temporarily reduce emissions from agricultural activities (e.g., use of tractors and other farm implementation, decreased use of ag chemicals, etc.) during operation of the Project. As described earlier, the Byron Solar Project is expected to offset approximately 307,563 metric tons of CO₂, the equivalent of 66,447 passenger vehicles driven for one year, 338.9 million pounds of coal burned, and 35,491 homes' energy consumption for one year (USEPA, 2021a).

Additionally, the Project has been designed with resiliency in mind as the climate continues to change in Minnesota. Project equipment will be carefully engineered and selected to withstand the potential for an increase in the frequency of severe weather events. Similarly, the stormwater management system has been designed using NOAA Atlas-14, a modeling tool that provides precipitation frequency estimates for many of the Midwestern states, including Minnesota. The model takes into consideration the historical frequency of heavy rainfall events from NOAA's precipitation frequency data server (PFDS), which is of importance to project engineers when designing stormwater infrastructure that will be in place for the life of the Project.

The Byron Solar Project is expected to produce a number of beneficial climate change effects; therefore, additional mitigative measures are not proposed.

6.9 Unavoidable Impacts

The Project has been thoughtfully sited and designed to avoid natural environment effects to the degree possible and practicable. However, with all construction projects, impacts to the natural environment are not entirely avoidable; temporary, minor impacts will occur in some circumstances. The Applicant has taken steps to minimize the long-term effects of these impacts by implementing mitigation measures where warranted. Environmental effects related to the Project, and efforts to minimize and mitigate these effects, are discussed in detail within this application. Environmental impacts that are not entirely avoidable, but will be minimized and mitigated, are described below. The majority of these unavoidable impacts will be temporary in nature, will occur during Project construction, and will be rectified through BMPs and site restoration activities.

The primary unavoidable impacts that will resolve following construction include the following:

- Construction-related noise,
- Dust related to construction traffic,
- Construction-related traffic,
- Snowmobile Trail 302 route change,
- Wildlife displacement, and
- Exposed soils from grading activities and potential for soil erosion and sedimentation.

The primary unavoidable impacts that are anticipated to remain for the life of the project include the following:

- Aesthetic changes to the landscape (agricultural landscape to solar),
- Land use change from row-crow agriculture to solar panels and perennial vegetation,
- Re-routing of Snowmobile Trail 302, and
- Infrequent vehicle trips from maintenance vehicles traveling to and from the site.

7.0 Agency and Stakeholder Coordination

Prior to preparing and filing this Application, the Applicant engaged with local, state, and federal regulatory stakeholders to gain feedback. Additionally, the Applicant contacted the eleven recognized Minnesota Tribal Nations for comments.

On March 18 and 19, 2021, the Applicant sent an informal Project introduction letter and map to federal and state agencies, Minnesota Tribal Nations, and local cities and townships. The agencies and stakeholders contacted are listed in Table 32, along with dates of further coordination.

A representative letter and responses received as of the date of this application are included in Appendix C. A summary of responses and meetings with stakeholders is included in the table below. The Applicant will continue to work with local, state, federal agencies, and Minnesota Tribal Nations as the Project advances.

Also, the Applicant submitted a Project introduction letter to MNDNR staff in March 2021. On April 16, 2021, the MNDNR responded to the Applicant with the following recommendations. The Applicant's intentions regarding these comments follow in italics.

- Refer to the MNDNR's Commercial Solar Siting Guidance (MNDNR, 2016a) and Prairie Establishment and Maintenance Technical Guidance for Solar Projects. The MNDNR encourages establishment of native, pollinator friendly vegetation and using wildlife friendly erosion control and invasive species prevention BMPs. *The Applicant reviewed the MNDNR (2016) Commercial Solar Guidance for the Project. Additionally, the Applicant will implement MNDNR guidance of wildlife-friendly erosion control and invasive species prevention BMPs by installing either a 6-foot chain-link fence with top guard angled out and upward at 45 degrees with 3-4 strands of smooth wire (no barbs), or 8' chain link for security and safety purposes. Barbed wire will not be used around the perimeter of the Project. The Applicant is also working in cooperation with regulatory agencies regarding an appropriate seed mix to use within the Solar Facility.*
- An NHIS review request needs to be submitted if not already done so. Upon preliminary review of the NHIS database, our non-game wildlife staff flagged the potential for state threatened Wood Turtles along the Southern border of the project boundary. These animals are legally protected. *The Applicant submitted an official request for a Natural Heritage Information System (NHIS) inquiry on May 26, 2020 and received a response on May 27, 2020. An updated request due to project boundary changes was submitted on March 10, 2021; a response to the request had not been received as of the date of this submittal. The Applicant is aware of the potential for state threatened Wood Turtles and intends to adhere to the General Wood Turtle Guidance provided by the MNDNR including minimizing use of heavy equipment near streams during May-October, informing workers of their potential presence, using silt fence to prevent turtles from entering construction zones and notifying MNDNR Nongame Wildlife Specialists if the species is observed (live or dead).*
- MNDNR notes that a Grant-In-Aid Snowmobile Trail sponsored by Dodge County crosses the length of the Solar Facility from northwest to southeast and is a major connection between Byron and Kasson. The MNDNR recommends coordinating with the trail sponsor as soon as possible. *The Applicant discussed the issue of the snowmobile trail with DNR staff on May 3, 2021 to gain insight regarding steps to be taken to allow both uses. The Applicant will work with landowners and the snowmobile trail club sponsors to provide options for a trail re-route around the Solar Facility.*
- The MNDNR recommends avoiding/minimizing impacts to wetlands by preventing compaction and maintaining soil structure, avoid excavation, and not using these areas to stage equipment. Ensure all wetland and WCA requirements are fulfilled by contacting the appropriate WCA authority. *The Applicant intends to avoid or minimize impacts to jurisdictional wetlands to the degree practicable. Unavoidable impacts will be properly permitted with local, state, and federal regulatory agencies.*
- If construction dewatering is necessary and exceeds the threshold of 10,000 gallons/day or a million gallons per year, a temporary water use permit is required. *Due to groundwater levels at approximately 70 feet below grade, the Applicant does not anticipate the need for dewatering that would trigger a dewatering permit. However, the Applicant will pursue a permit from the DNR should it appear that these thresholds will be exceeded for any reason.*
- Much of the project footprint is within a sensitive groundwater area. *The Solar Facility and HTVL are not mapped as being within a designated Wellhead Protection Area,*

Special Well and Boring Construction Area, or EPA designated Sole Source Aquifer. However, the site is known to have karst topography in several locations. The Applicant is aware of these karst features and plans to bridge them in such a way that allows for panel installation. In doing so, the karst areas will essentially be capped, and covered with vegetation, reducing the opportunity for downward migration of unwanted materials into the groundwater. Additionally, the conversion of the site to a solar use will take the land out of active agricultural production, a land use that is generally herbicide and pesticide intensive.

- The project footprint falls into three watersheds: Salem Creek, Cascade Creek, and Matsen Creek which are all part of the Zumbro River Major (HUC-8) Watershed. *Noted.*

Table 32: Summary of Agency Correspondence

Agency	Response Date and Summary
Federal	
United States Army Corps of Engineers (USACE), St. Paul District	<p>March 22, 2021 (Initial Agency Response) – USACE assigned a Project Manager and a Project file number to the Project.</p> <p>April 13, 2021 (Agency Response) – USACE provided general information on the regulatory program that may apply to the Project.</p>
United States Fish and Wildlife Service (USFWS), Region 3	<p>March 26, 2021 (Initial Agency Response) – USFWS staff indicated technical assistance is provided through IPaC, and consultation specifically for northern long-eared bat can be completed by using the online determination key.</p> <p>March 30, 2021 – Acknowledged receipt.</p> <p>The Applicant conducted further IPaC analysis and determined the Project is No Effect for northern long-eared bat based on little to no tree clearing and any tree clearing occurring outside of NLEB pup-rearing season.</p>
Federal Aviation Administration (FAA)	No response to date.
State	
Minnesota State Historic Preservation Office (SHPO)	July 9, 2021 (Initial Agency Response) – Concurred with the finding in the Phase I Archeology Report that the prehistoric utilized flake (site 21DO0020) is not eligible for listing in the National Register of Historic Places.
Minnesota Department of Natural Resources (MNDNR)	<p>March 19, 2021 (Initial Agency Response) – DNR requests shapefile of Project layout.</p> <p>March 22, 2021 – Project boundary emailed to MNDNR staff.</p> <p>May 3, 2021 – Phone conversation with Joel Wagar, DNR Parks and Trails Area Supervisor, regarding the Snowmobile</p>

Table 32: Summary of Agency Correspondence

Agency	Response Date and Summary
	Trail 302. May 12, 2021 – Updated Project layout emailed to MNDNR staff. Requested status of revised NHIS review request submitted on March 10, 2021.
Minnesota Pollution Control Agency (MPCA)	No response to date.
Minnesota Department of Health (MDH)	No response to date.
Minnesota Department of Agriculture (MDA)	March 25, 2021 (Initial Agency Response) – Will review the Agricultural Impact Mitigation Plan and Vegetation Management Plan. March 25, 2021 – Draft is being prepared and will be sent for review and comment when complete. June 18, 2021 – Draft Agricultural Impact Mitigation Plan provided to MDA staff for review and comment. July 6, 2021 – The only comment from MDA staff was to consider the use of agricultural woven wire fencing; however, the MDA does not have an official position on fencing materials.
Minnesota Department of Transportation, District 6 (MnDOT)	No response to date.
Minnesota Department of Employment & Economic Development (DEED)	No response to date.
Tribes	
Lower Sioux Indian Community THPO	No response to date.
Upper Sioux Community THPO	March 21, 2021 (Initial Tribal Response) – Requested a more detailed map and inquired if archaeological work has been or will be performed. March 23, 2021 – Stated that archaeological field work would occur this spring, and a more detailed project map would be sent when project planning was further along. March 23, 2021 (Tribal Response) – Inquired if tribal representatives could accompany the field archaeologists.

Table 32: Summary of Agency Correspondence

Agency	Response Date and Summary
	<p>March 30, 2021 – Stated the archeological field work was largely done last fall and offered to provide exact dates of the remaining field work within the HVTL corridor if a tribal representative is interested in visiting the site.</p> <p>April 23, 2021 – Sent a more detailed map showing the Preliminary Development Areas. Indicated remaining fieldwork is planned for May 5-7 but may be delayed until the following week if the work takes longer or is delayed by weather.</p> <p>April 26, 2021 (Tribal Response) – Stated they will take a closer look at the specific area and wait for results from the field work.</p> <p>May 21, 2021 (Tribal Response) – In a letter dated April 7 and sent via email on May 21, indicated the Project is in an area where the Dakota lived, prayed, hunted, gathered, battled, and buried their relatives. Advised that all work must stop if ground disturbance uncovers any human remains, artifacts, or funerary objects and the SHPO and THPO should be contacted as soon as possible.</p>
Prairie Island Indian Community THPO	No response to date.
Shakopee Mdewakanton Sioux Community	No response to date.
Bois Forte THPO	No response to date.
Fond du Lac THPO	No response to date.
Grand Portage THPO	No response to date.
Leech Lake THPO	March 23, 2021 (Initial Tribal Response) – Provided the counties reviewed by the tribe.
Mille Lacs THPO	No response to date.
Red Lake Nation	No response to date.
White Earth Nation THPO	No response to date.
Minnesota Indian Affairs Council Cultural Resources	No response to date.
Local	
City of Byron	No response to date.
City of Kasson	No response to date.

Table 32: Summary of Agency Correspondence

Agency	Response Date and Summary
Dodge County	<p>December 8, 2020 – Conversation with neighboring property owner/Dodge County Sheriff to discuss viewshed.</p> <p>December 17, 2020 – Presentation and conversation + Q&A with Canisteo Township and Dodge County Officials: Ken Folio – Superintendent Canisteo Loren Torrens – Board Member Larry Edgar – Board Member Frank Wyatt – Clerk Dodge County Highway Engineer Jim Elmquist – County Administrator Mark Gamm – Environmental Services Lauren Cornelius – Dodge County Zoning Administrator</p> <p>June 22, 2021 – Contacted Lauren Cornelius, County Zoning Administrator, to inquire about current or planned residential, commercial, industrial, or roadway projects near the Byron Substation.</p>
Olmsted County	<p>June 22, 2021 – Contacted Mark Engel, County Planning Supervisor, to inquire about current or planned residential, commercial, industrial, or roadway projects near the Byron Substation.</p> <p>June 22, 2021 (Initial Agency Response) – Provided information on the Township Cooperative Planning Association (TCPA), the entity who governs the development and land use proposals in Kalmar Township. Also provided a link to County road projects and County Public Works.</p>
Dodge Soil and Water Conservation District	No response to date.
Olmsted Soil and Water Conservation District	March 19, 2021 (Initial Agency Response) – Acknowledged receipt.
Byron School District	No response to date.
Kasson-Mantorville School District	No response to date.
Kasson-Mantorville Trails	<p>May 21, 2021 – Conversation with Mr. Corey Hower of Kasson-Mantorville Trails to discuss rerouting the snowmobile trail. Mr. Hower stated he was open to rerouting the trail and requested Project maps with the current and proposed trail alignments.</p> <p>May 26, 2021 – The Applicant provided maps to Mr. Hower showing the current trail and proposed trail alignments.</p>

Table 32: Summary of Agency Correspondence

Agency	Response Date and Summary
	June 10, 2021 (Kasson-Mantorville Trails Response) – Mr. Hower stated the club agreed with the proposed route and requested to be notified if any additional changes to the route would be needed and when the reroute would go into effect. The Applicant will continue coordinating the Mr. Hower and Kasson-Mantorville Trails.
Mantorville Township	No response to date.
Kalmar Township	No response to date.
Canisteo Township	<p>December 4, 2020 – Telephone conversation with Larry Edgar and Ken Folie, Canisteo Township Board Members about construction methods, timeline, and community concerns.</p> <p>December 17, 2020 – Presentation and conversation + Q&A with Canisteo Township and Dodge County Officials: Ken Folio – Superintendent Canisteo Loren Torrens – Board Member Larry Edgar – Board Member Frank Wyatt – Clerk Dodge County Highway Engineer Jim Elmquist – County Administrator Mark Gamm – Environmental Services Lauren Cornelius – Dodge County Zoning Administrator</p>
Township Cooperative Planning Association (TCPA)	June 22, 2021 – Contacted TCPA Administrators Roger Ihrke and David Meir to inquire about current or planned residential, commercial, industrial, or roadway projects near the Byron Substation in Kalmar Township.

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