HAYWARD SOLAR PROJECT

Application to the Minnesota Public Utilities Commission for a Site Permit for a Large Electric Generating Facility

Alternative Permitting Process
MPUC Docket No. IP-7053/
GS-21-113 May 5, 2021

Application to the Minnesota Public Utilities Commission for a Site Permit for the up to 150 MW Hayward Solar Large Electric Generating Facility

Hayward Solar Project

Freeborn County, Minnesota

MPUC Docket Number: IP-7053/GS-21-113

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May 5, 2021

Project Name: Hayward Solar Project

Project Location: Freeborn County, MN

Applicant: Hayward Solar LLC

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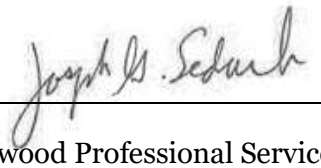
Signature: 

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1.0 Introduction

Hayward Solar LLC (Hayward Solar or Applicant) is a Delaware limited liability company and a wholly owned indirect subsidiary of CD Clean Energy and Infrastructure VII JV, LLC (CD Fund VII). As further described below, Hayward Solar is proposing to construct and operate an up to 150 megawatt (MW) alternating current (AC) photovoltaic (PV) solar energy generating facility and associated systems (Hayward Solar Project or Project) planned to be located in Hayward Township, Freeborn County, Minnesota (**Figure 1**). The overall Project, including transmission line interconnection facilities, are proposed within an approximate 1,958-acre area (Project Area) and the Project would connect to the existing Southern Minnesota Municipal Power Agency (SMMPA) Hayward-Murphy Creek 161 kilovolt (kV) high voltage transmission line (HVTL) that transects the Project boundary (see **Figures 1 & 2**).

Construction of the Project requires a Certificate of Need (CN) and Site Permit (SP) from the Minnesota Public Utilities Commission (Commission or MPUC). Hayward Solar respectfully submits this Site Permit Application (Application) to the Commission for a Site Permit in accordance with the Minnesota Power Plant Siting Act (Minnesota Statutes §216E) and Minnesota Administrative Rules Chapter 7850.

A CN is required for the Project and a CN application will be submitted separately to the MPUC. The Project is 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 SP from the Commission prior to construction. The SP is the only site approval needed for construction of the Project (Minnesota Statutes §216E.10, Subd. 1).

On April 13, 2021, Hayward Solar provided the Commission notice that it is seeking approval for its Application under the alternative review process provided in Minnesota Statutes §216E.04, Subd. 2(8) and Minnesota Rules 7850.2800-7850.3900. Additionally, on December 7, 2020, Hayward Solar provided written request to the Minnesota Department of Commerce (DOC), Energy Environmental Review and Analysis unit (EERA) for a solar energy generating system size determination in accordance with Minnesota Statutes §216E.021. The size determination response from EERA was issued on December 29, 2020, and is provided along with the request in **Appendix A-4**.

The Hayward Solar Project will use PV modules affixed to tracking systems that allow the PV modules to track the sun from east to west and will be constructed on a schedule that facilities an in-service date in 2023. The Project is described in more detail throughout this Application. References to the Project Area indicates all land within the Project boundary considered for the SP (**Figure 1**). As further described herein, references to the Preliminary Development Area apply the areas hosting solar equipment and supporting infrastructure located within the overall Project Area (**Figure 2**).

Hayward Solar proposes to interconnect the Project to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL (which transects the Project Area) via a line tap and new SMMPA Switchyard that will be permitted, constructed and owned by SMMPA (**Figures 1 & 2**). The Midcontinent Independent System Operator (MISO) interconnection request for the Project is in the 2019 queue. Hayward Solar anticipates executing a Generator Interconnection Agreement (GIA) with MISO in the 1st quarter 2022. This interconnection will provide sufficient outlet to accommodate all of the solar energy generation from the Project.

1.1 Purpose and Need

The Project will provide up to 150 MW AC of capacity and approximately 168,000 megawatt hours (MWh) annually of reliable, deliverable on-peak energy. The Project will provide electricity to approximately 28,000 homes annually and prevent emission of approximately 261,871,072 pounds (118,783 metric tons) of carbon dioxide equivalent annually.[1] The Project is being developed, designed and permitted to meet or exceed applicable state and local requirements, including the prime farmland exclusion rule (discussed below) to the extent practicable.

The Project will specifically address Minnesota's mandate and goals found in the Renewable Energy Objectives and Governor Walz's "One Minnesota Path to Clean Energy" (to require 100% carbon-free energy by 2050), and applicable energy planning requirements.[2] It will serve consumers' growing demand for renewable energy under various utility-sponsored programs and for utilities, independent power purchasers and corporations seeking to use renewable energy for business growth. The Project will serve this demand as a way to diversify electricity sources, address environmental concerns, meet anticipated growth in electrification (e.g., vehicles, heating, etc.), and address Renewable Portfolio Standard and policy goals, as described above. The Project will also benefit the local community through investment in construction spending, operation of the Project, property and business taxes, and landowner lease payments.

The Project is needed to meet the growing demand for additional renewable resources from commercial and industrial (C&I) customers, to meet the Solar Energy Standard pursuant to Minnesota Statutes and to address 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 (Minnesota Statutes §216B.1691). Hayward Solar is working towards securing a Power Purchase Agreement (PPA) or other enforceable mechanism to sell the electricity generated by the Project. 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 C&I customers that have set clean energy goals.

1.2 Applicant Information

The following provides information concerning the Applicant, Permittee, and ownership of the Project.

1.2.1 Permittee and Contact Information

The Permittee for the Site Permit will be:

Hayward Solar LLC
6160 Summit Drive North, Suite 205
Brooklyn Center, MN 55430

[1] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh (168,000 MWhs) annual production PVSYST model. See Greenhouse Gas Equivalencies Calculator | Energy and the Environment | US EPA.

[2] See Minnesota Statutes §§216B.1691, Subd. 2(f), 216C.05, and 216E.02, Subd. 1.

The contact persons regarding this Application are:

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1.2.2 Ownership at Time of Filing

Hayward Solar is the owner of the Project at the time of filing of this Application and it has secured all necessary land rights (lease option agreements for the solar facility and a purchase agreement for the new SMMPA Switchyard[3]) for construction and operation of the proposed Project. Under the leases, land used for the Project would be returned to the underlying landowners upon completion of the 30-year term of the Project. The lease agreements are in place with seven private landowners of the Project Area (Gerald D. Edwards Family Trust, Elaine Flusek, Ladlie Properties Limited Partnership, Jon L. Larson, Douglas Thompson Rev Living Trust, Todd Hinrichs and Mary Ann Petran). All current landowners actively work their land as agricultural use. One of the landowners maintains approximately 900 acres of the Project Area.

Hayward Solar is an independent power producer; it is a Delaware limited liability company and a wholly owned indirect subsidiary of CD Fund VII, a clean energy infrastructure fund.

Arevon Energy Management (Arevon) is an affiliate of CD Fund VII with the mandate to oversee the development and energy products marketing while Arevon Asset Management is another affiliate of CD Fund VII that oversees financial and operational asset management; both are focused on providing highly specialized services to ensure portfolio growth.

Tenaska, an energy development company with headquarters in Omaha, Nebraska is providing development services to Arevon for the Project. Tenaska is one of the leading independent power producers in the United States and has developed approximately 10,000 megawatts of natural

[3] Note Hayward Solar will acquire a small parcel of land that will be transferred to SMMPA and used for construction and operation of the new SMMPA Switchyard to connect the Project to the POI/grid via the SMMPA Hayward-Murphy Creek 161 kV HVTL. This is the only land parcel that Hayward Solar plans to purchase and transfer to SMMPA.

gas-fueled and renewable power generation with its affiliates. Tenaska, alongside Arevon, will be overseeing the Project. Tenaska most recently completed construction and commenced operation of the Nobles 2 Wind Project in Nobles County, MN.

1.2.3 Proposed Ownership after Commercial Operations

Hayward Solar will own, operate and maintain the Project following the start of commercial operations (COD) which is anticipated to be in 2023. While not planned at this time, Hayward Solar, CD Fund VII and Arevon reserve the right to sell or assign the Project to another qualified entity at any time before, during or after the Project is constructed. Any sale or assignment of the Site Permit or Certificate of Need would require approval by the Commission. Any future buyer or assignee will be required to meet SP conditions. As indicated above, SMMPA will own and operate the new SMMPA Switchyard and land associated with the SMMPA Switchyard site.

1.3 Project Schedule

Hayward Solar anticipates receiving Commission approval of the Project in early 2022. Construction currently is anticipated to begin in 2022 with COD by the end of 2023. To meet the COD, the following schedules are anticipated for the various phases of Project development.

- **Land Rights:** Hayward Solar has secured land rights and acquired all the necessary lease option agreements, purchase agreement (for the new SMMPA Switchyard site) and easements for development of the Project in 2019-2021. While several acres are also under lease option to support the Project Substation and Operation and Maintenance (O&M) building, all of the land required for the Project except for the SMMPA Switchyard will be leased. Prior to commencement of construction the lease options and SMMPA Switchyard purchase option will be exercised and converted into leases and owned property, respectively.
- **CN and SP:** Hayward Solar anticipates that the CN and SP for the Project will be issued in the first or second quarter 2022.
- **Other Permits:** Hayward Solar is responsible for obtaining permits and approvals necessary for construction and operation of the Project. Hayward Solar is working with applicable regulatory staff and anticipates pertinent permits/approvals to be issued by the end of the first quarter or early part of second quarter of 2022 prior to the start of construction.
- **Equipment Purchase:** Hayward Solar anticipates procuring Project equipment between the fourth quarter 2021 and second quarter 2022. Final contractor selections will be made contingent on the Hayward Solar Project CN and SP being approved and issued by the Commission in association with Docket No. IP-7053/CN-21-112 and GS-21-113, respectively.
- **Construction:** Hayward Solar will oversee the primary contractors performing construction of the Project. These construction activities will include site preparation, grading, access road building, solar array assembly, electrical, transmission, and communications installation work. Construction would occur between the second and third quarters 2022 and end in the fourth quarter 2023. Hayward Solar anticipates beginning construction of the Project soon after being granted a CN and SP by the MPUC, fulfilling necessary SP pre-construction compliance requirements and securing other required approvals.

- **Testing and Commissioning:** Testing and commissioning will occur at the end of construction and prior to the COD. This will be either late third quarter or fourth quarter of 2023.
- **Operation:** As indicated above, the COD of the Project will occur either third or fourth quarter 2023 after construction and testing/commissioning activities are completed.

1.4 Required Project Permits

Development of the proposed Project will likely require several federal, state, and local permit approvals prior to starting construction as described below. Potential permits, with respect to their prospective applicability and expected timing, are detailed in Section 1.4.3 below (**Table 1**).

1.4.1 Certificate of Need

Pursuant to Minn. Stat. § 216B.243, all "large energy facilities" must receive a CN from the Commission. Since the proposed Project meets the criteria for a LEF (50 megawatts of generation or greater), a CN is required for the Project. Exemptions are available for solar and wind generation facilities (§ 216B.243, Subd. 8), such as if the system is owned and operated by an independent power producer and the electric output of the system is not sold to an entity that provides retail service in Minnesota, a regional transmission organization, or independent system operator. The Project does not qualify for an exemption at this time. However, if circumstances change and Hayward Solar executes a PPA for the Project or the Project otherwise becomes exempt from CN requirements, Hayward Solar will notify the Commission.

Hayward Solar will submit a CN application at the same time as the Site Permit application to the MPUC in the first quarter of 2021 for construction of the proposed large solar energy facility under docket number IP-7053/CN-21-112. On February 5, 2021, Hayward Solar submitted a request to the MPUC for exemption from certain CN data content requirements specific to the operation and regulation of facilities proposed by utilities. The exemption request was considered and orally approved by the Commission on March 18, 2021. The MPUC issued an Order dated March 24, 2021, approving the requested exemptions with modifications as provided by the DOC and varied the 30-day requirement of Minn. R. 7849.0200, subp. 6 (see Docket No. IP-7053/CN-21-112, Doc. No. 20213-172146).

Current Project designs propose connecting the proposed Project to the grid to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL. All electricity generated by the Project will be routed to a new Project Substation (Project Substation) via underground collector cables. The Project Substation will be connected to the new SMMPA Switchyard using an approximate 200-300 foot long 161 kV overhead transmission line (Project Gen-Tie Line) (**Figures 3 & 4**). The SMMPA Switchyard serves as the point of interconnection (POI). The new SMMPA Switchyard will connect to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL via 750-900 foot long in/out 161 kV overhead transmission lines (SMMPA Line Tap). The Project Substation and Project Gen-Tie Line will be constructed, owned, and operated by Hayward Solar. The SMMPA Switchyard and SMMPA Line Tap will be permitted, constructed, owned, and operated by SMMPA. No transmission infrastructure exceeding the voltage and length requirements of a "large energy facility" under Minnesota Statutes §216B.2421, Subd. 1, are proposed for the Project. Therefore, the proposed Project will not trigger the need for a separate Route Permit or CN from the Commission for planned Project interconnection facilities. As such, the Project also does not require a separate notice plan as defined in Minn. R. 7829.2550, which is required for a HVTL that requires a CN.

1.4.2 Site Permit

The Project falls within the definition of a Large Electric Generating Facility in the Power Plant Siting Act, and thus, requires a SP from the Commission prior to starting construction. Pursuant to Minn. Stat. § 216E.04, Subd. 2(8), Hayward Solar seeks approval of its Application under the alternative review process provided under Minn. Stat. § 216E.04 and Minnesota Administrative Rules 7850.2800-7850.3900. Hayward Solar filed a Notice of Intent to Submit a Site Permit Application under the Alternative Permitting Process to the Commission on April 13, 2021.

1.4.3 Other Potential Permits and Approvals

Development and construction of the Project will likely require several federal, state, and local permit approvals prior to construction. Hayward Solar will obtain all permits, licenses, and approvals that are required for the Project concurrent with or following issuance of the CN and SP. Potential permits and approvals, with respect to their prospective applicability and expected timing, are included in **Table 1** below.

Table 1: Potential Permits/Approvals

Agency	Permit	Applicability	Permit Status and 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 in jurisdictional waters, as needed
U.S. Environmental Protection Agency (EPA)	Spill Prevention, Control, and Countermeasures Plan	Project facilities with oil storage of more than 1,320 gallons	To be prepared prior to construction, as needed
State			
Minnesota Public Utilities Commission	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, application filed concurrent with the Application
	Site Permit	Required for LEFs 50 MW or greater	To be obtained prior to construction, application filed concurrent with the Certificate of Need Application
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits.	To be obtained prior to construction in jurisdictional waters, as needed

Agency	Permit	Applicability	Permit Status and Timing
MPCA	National Pollutant Discharge Elimination System General Permit and Stormwater Pollution Prevention Plan	Construction activity that disturbs one or more acre of land.	To be obtained/prepared prior to construction
Minnesota Department of Health (MDH)	Well Construction permit	Installation of a water supply well.	To be obtained prior to construction of a well (for O&M building), as needed
Minnesota Department of Labor and Industry (MDLI)	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 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 dewatering activities, as needed
MNDNR, Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure.	To be obtained prior to crossing state land with utility infrastructure, 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 registered properties, or require Section 106 compliance.	Obtain concurrence on Phase I inventory 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 installation of utilities within MnDOT right-of-way, as needed
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of-way.	To be obtained prior to construction of driveway on MnDOT right-of-way, 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

Agency	Permit	Applicability	Permit Status and Timing
County/Local			
	Building Permit	Required for new construction in Freeborn County.	To be obtained prior to construction, as needed
	Minnesota Wetland Conservation Act (WCA) Approval (in conjunction with Freeborn County Soil and Water Conservation District)	Activities affecting water resources.	To be obtained prior to construction in jurisdictional waters, as needed
	Septic Permit Application	Required prior to installation of any septic system in Freeborn County.	To be obtained prior to construction of septic system, as needed
	Access Permit	Required for moving, widening or creation a new driveway access to County roads.	To be obtained prior to construction of new driveway access, as needed
	Utility Permit	Required for installation of utility infrastructure in a County road right-of-way.	To be obtained prior to installation, as needed
	Right-of-Way Permit	Required to work within public road right-of-way.	To be obtained prior to work within right-of-way, as needed
	Oversize/Overweight Permit	Use of overweight or oversized vehicles on County roadways.	To be obtained prior to equipment deliveries, as needed

1.4.4 Request for Joint Proceeding with Certificate of Need

As described above, Hayward Solar is applying for a CN for the Project in Docket No. IP-7053/CN-21-112. Minnesota Statutes Section 216B.243, Subd. 4 and Minn. R. 7849.1900, subp. 4, permit the Commission to hold joint proceedings for a CN and SP in circumstances where a joint hearing is feasible, more efficient, and may further the public interest. As such, Hayward Solar respectfully requests that the Commission order joint proceedings for review of Hayward Solar's CN and SP applications. Holding joint proceedings is in the public interest because it will make it easier for members of the public, regulatory agencies and other stakeholders to participate in applicable meetings and hearings, provide a comprehensive record regarding potential benefits, impacts and avoidance/minimization measures, and improve administrative efficiency for agency staff reviewing these applications.

1.4.5 Local Approvals

Pursuant to Minnesota Statutes 216E.10, Subd. 1, the issuance of a SP and for large electric power generating plant, is the sole site approval required to be obtained. The SP supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

Hayward Solar has consulted with local officials 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 5.0 below.

2.0 Project Description

The following provide a description of the Project Area, Preliminary Development Area and proposed Project infrastructure including land control, Project design, interconnection, prohibited areas, alternatives, costs, and potential future expansions.

2.1 Overall Project Description

Hayward Solar is proposing an up to 150 MW AC nameplate solar-energy capacity project located within the approximate 1,958 acres Project Area (**Figures 1 & 2**) in Hayward Township, Freeborn County, Minnesota. The Project location is indicated in **Table 2** and shown on **Figure 1**.

Table 2: Project Location

Township	Range	Section
102N	20W	1
102N	20W	2
102N	20W	3
102N	20W	11
102N	20W	12
102N	20W	13
102N	20W	14
102N	20W	15

Project facilities include PV solar panels/arrays, tracking racks, inverters, collection lines, access roads, and related facilities (Project Substation, O&M building, SMMPA Switchyard) and ancillary equipment or buildings as necessary. Detailed descriptions of Project facilities and design are provided in Section 3.0 below.

Hayward Solar has secured site control for the entire proposed Project via lease option agreements and a purchase agreement (for the proposed new SMMPA Switchyard site). The final Project design is expected to occupy approximately 1,272 acres (Preliminary Development Area **– Figure 2**), within the overall 1,958-acre Project Area (**Figure 1**). As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design.

Site control for the Project includes the crossing area of SMMPA's existing 161 kV HVTL (**Figures 2 & 3**). The Project will connect to the grid via the 750-900 foot long SMMPA Line Tap to the new SMMPA Switchyard. The Project connection to SMMPAs infrastructure will be the approximate 200-300 foot long overhead 161 kV Project Gen-Tie Line between the Project Substation and the SMMPA Switchyard (**Figures 3 & 4**).

The Project to be permitted by the SP will consist of PV solar panels, inverters, racking, fencing (around Project facilities), access roads, an O&M building, Project Substation, power transformer, overhead Project Gen-Tie Line, and associated equipment. A detailed Preliminary Site Plan of the current Project design together with the SMMPA Line Tap and SMMPA Switchyard, is included in **Appendix B**. Engineering and design will continue as pending considerations are evaluated and determined.

Hayward Solar is planning to use PV solar panels with a total equivalent PV generating capacity of 156.6 MW and a mixture of 18 3150 kilovolt-ampere (kVA) and 30 3600 kVA central inverters. This preliminary design and Project layout takes into account applicable energy loss (approximately 2% AC losses) and would allow for a maximum of 150 MW AC of solar energy generation and transmission onto the grid (which is capped at 150 MW AC as part of the interconnection request and generator interconnection agreement with MISO that will be signed prior to construction of the Project). Accordingly, this Application is requesting a SP for the nameplate capacity of the Project as measured at the point of interconnection. The current layout and proposed equipment are preliminary and subject to change as the design advances. Hayward Solar plans to construct the Project on a schedule that facilitates an in-service date in 2023.

Hayward Solar believes that the selected Project location in Freeborn County is feasible and prudent for solar development based upon the proximity to existing electric transmission infrastructure, minimal impact to natural resources, sufficient solar resource, available non-prime farmland, and consistency with existing land uses and local zoning.

2.2 Facility and Interconnection Description

2.2.1 Facility

As further detailed in Section 3.0 below the Project facilities and equipment include:

- PV panel solar modules;
- Inverters;
- Step-up transformers (connecting inverters to collection lines/Project Substation);
- Electrical wiring (connecting PV panels to inverters);
- Tracking rack structures;
- Collection lines (connecting inverters to Project Substation);
- Security fencing and gates;
- Access roads;
- Stormwater collection ponds (associated with the Project);
- O&M building;
- Supervisory Control and Data Acquisition (SCADA) system;
- Project Substation;
- Power transformer;
- Overhead 161 kV Project Gen-Tie Line (Project Substation to SMMPA Switchyard);
- Switchgear;
- Metering equipment; and
- Ancillary equipment or buildings as necessary.

A Detailed Preliminary Site Plan showing Project facilities and related equipment is included in **Appendix B**.

2.2.2 Project Gen-Tie Line Description, Project Substation, SMMPA Switchyard and SMMPA Line Tap

As described in Section 1.4., a separate Route Permit is not required for the Project. The planned Project Gen-Tie will be approximately 200-300 feet long and will connect the Project Substation to the new SMMPA Switchyard (which facilitates the interconnection to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL). The anticipated path of transmission line facilities is shown on **Figures 3 & 4**. The 161 kV Project Gen-Tie Line will likely exit from the northwestern portion of the Project Substation and connect to the new SMMPA Switchyard.

The Project Substation is proposed in the northwestern part of the Project boundary (**Figures 2 & 3**). The Project Substation will consist of a 34.5 to 161 kV power transformer and related equipment. Underground 34.5 kV AC collector lines from the Project inverters will deliver solar generated energy to the Project Substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 161 kV by the transformer located at the Project Substation. The power will then be transmitted to the SMMPA Switchyard via the Project Gen-Tie Line.

The proposed new SMMPA Switchyard will be used to interconnect the Project to the existing SMMPA transmission line. The existing SMMPA Hayward-Murphy Creek 161 kV HVTL crosses through the northern portion of the Project Area (**Figures 2 & 3**). Hayward Solar will acquire the land underlying the new SMMPA Switchyard (via a purchase option agreement) and secure any other land rights that are necessary to facilitate the connection of the SMMPA Hayward-Murphy Creek 161 kV HVTL to the new SMMPA Switchyard. SMMPA will modify the existing Hayward-Murphy Creek 161 kV HVTL, installing new deadend structures within the right-of-way to re-direct the circuit in/out of the new SMMPA Switchyard via the SMMPA Line Tap. SMMPA will design, engineer, permit and construct the new SMMPA Switchyard and the SMMPA Line Tap. Hayward Solar will convey the real property for the SMMPA Switchyard and any other land rights necessary to facilitate the SMMPA Line Tap and connection to the SMMPA Hayward-Murphy Creek 161 kV HVTL. These facilities will be network facilities owned and operated by SMMPA.

2.2.3 Size and Capacity

Hayward Solar estimates that approximately 1,272 acres of the 1,958 acres is necessary to accommodate the final design and engineering of the proposed up to 150 MW AC Project (i.e., the Preliminary Development Area). The Preliminary Development Area is generally defined as the area containing all Project facilities located within the Project security fencing (e.g., arrays, inverters, collection lines, etc.) and includes the access roads extending beyond the Project facility fenced area. It also includes the Project Substation, O&M building and the area on which the new SMMPA Switchyard will be constructed by SMMPA (**Figure 2**).

Hayward Solar has 100% land control for the Project, which is the approximate 1,958 acre Project Area comprised of private land under either a lease option agreement or a purchase option agreement (i.e., for the new SMMPA Switchyard site). The 1,958 acre land control area, the Project Area includes land which was secured to provide the acreage needed to complete final design, construction and operation of the Project as part of the SP process.

Hayward Solar filed a solar Size Determination Request for the Project with EERA on December 7, 2020 (see **Appendix A-4**). The EERA provided written response that it determined that the Project is not associated with any other existing or planned solar projects requiring them to be combined into a single project and that due to the Project size (up to 150 MW) Hayward Solar must submit an application for a Site Permit from the MPUC. Since Hayward Solar submitted the solar size determination request in December 2020, approximately 300 acres of additional land was added to the southwest corner of the initial Project Area. While the Project size (up to 150 MW) has not changed, the preliminary Project layout was revised utilizing portions of this additional land. Hayward Solar understands that the original solar Size Determination Request and EERA response apply and need not be updated at this time. As requested by the EERA, copies of these correspondence are included in **Appendix A-4**. **Figures 3 & 4** depict the Project interconnection facilities, preliminary Project layout and associated infrastructure of the proposed Project. Additional information on the proposed Project facility design and layout can be found in Section 3.1 and Detailed Preliminary Site Plan in **Appendix B**.

2.2.4 Prohibited and Exclusion Sites

Minn. R. 7850.4400, subp. 1 prohibits power generating plants from being sited in certain locations including: national parks; national historic sites and landmarks; national historic districts; national wildlife refuges; national monuments; national wild, scenic and recreational riverways; state wild, scenic, and recreational rivers and its land use districts; state parks; nature conservancy preserves; state scientific and natural areas (SNAs); and state and national wilderness areas. None of these prohibited sites are located within or near the Project Area as further discussed below.

In addition, Minn. R. 7850.4400, subp. 3 includes exclusion areas where power generating plants cannot be sited unless there is no feasible and prudent alternative. These exclusion areas include: state registered historic sites; state historic districts; state Wildlife Management Areas (WMAs); county parks; metropolitan parks; designated state and federal recreational trails; designated trout streams; and state water trails. None of these exclusion sites are located within or near the Project Area as further discussed below.

Subject to certain exceptions, Minn. R. 7850.4400, subp. 4 prohibits large energy power generating plants 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 150 MW AC net generating capacity of the Project, the prime farmland exclusion rule would allow use of up to 75 acres of prime farmland for the Project. Approximately 58 acres of prime farmland and 590 acres of prime farmland if drained are located within the Preliminary Development Area. These acreages of prime farmland would be temporarily taken out of agricultural production for the approximate 30-35 year life of the Project but would not be permanently removed.

The prime farmland exclusion rule provides an exception in the event that a feasible or prudent alternative cannot be identified. The Project Area is partially sited on prime farmland. Hayward Solar completed a detailed evaluation of potential alternative sites to avoid prime farmland and presents evidence that Hayward Solar was unable to find a feasible or prudent alternative to the Project and therefore qualifies for an exception to the rule (see Section 4.3.1.1 below and **Appendix C**).

2.3 Alternatives Considered but Rejected

In accordance with Minnesota Statutes 216E.04, Subd. 2(8), the Project qualifies for the alternative review process under Minnesota Rules 7850.2800-7850-3900 because it is a large electric power generating plant that is powered by solar energy. As such, Hayward Solar is not required to analyze alternative sites pursuant to Minnesota Rules 7850.3100 unless it rejected alternative sites. Hayward Solar did seek and analyze other areas in Minnesota where the Project could be sited to be compliant with the prime farmland exclusion rule (see Section 4.3.1.1 below and **Appendix C).** However, these areas were determined to not be feasible or prudent for siting the Project and were not carried forward as Project alternatives (**Appendix C**). Hayward Solar selected the proposed Project Area due to minimal environmental and prime farmland impacts, proximity to the electrical grid and existing transmission infrastructure, willing landowners, and available capacity of the grid to which the Project will interconnect.

2.4 Cost Analysis

Hayward Solar estimates the total installed capital cost for the entire Project will be approximately $130 million, as broken down in **Table 3** below. Actual capital costs depend on various factors such as construction labor, Project equipment and materials, electrical and communication systems, taxes/tariffs, final design considerations (e.g., access roads, O&M building, etc.), as well as potential ongoing impacts from COVID-19.

Operating costs are estimated at approximately $2.2 million per year, which includes labor, materials, and property taxes for the entire Project (solar generation and transmission facilities). The primary costs for O&M of the Project is associated with vegetation management, solar array cleaning and maintenance and applicable inspections. Initial O&M costs for the Project Gen-Tie Line and electrical system will be nominal for the first few years of operation because the lines will be new and minimal maintenance should be required.

Table 3: Estimated Project Costs

Task	Cost
Engineering, Procurement and Construction Contractor	$105 million
Development Expense	$5 million
Interconnection	$10 million
Financing	$5 million
Project Gen-Tie Line	$5 million
Project Total	**$130 million**

2.5 Future Expansion

Hayward Solar has no anticipated plans to expand the proposed Project at this time. As noted above, land planned for development of the Project will be leased from seven landowners for the 30-year term of the Project. Additionally, Hayward Solar has made an interconnection request from MISO for the up to 150 MW AC which is the planned Project energy output at the POI.

3.0 Engineering and Operational Design

The following describes the Project design, facility equipment, Balance of Plant (BOP) components, O&M building, security fencing and access to the Project. The Preliminary Facility Design is shown in **Figure 4** (see also Detailed Preliminary Site Plan in **Appendix B**).

3.1 Design

The Project's primary components include PV solar panel modules mounted on a linear axis tracking system (**Image 1**), centralized inverters, a Project Substation and Project Gen-Tie Line an O&M building, fencing, and access roads. The SMMPA Switchyard and the SMMPA Line Tap will be permitted, constructed, owned and operated by SMMPA . The current design includes use of NexTrackers which has one motor per tracker row. The final selection of equipment will be dependent upon equipment that is available at the time of construction. For descriptive purposes, an individual tracker row is used as a basic unit of the Project. A tracker row is made up of modules mounted on a flat beam oriented north-south, with a break in the middle where the gear box is located. The tracker rows tilt east-west to follow the sun throughout the day, are connected together in rows and are served by one motor. The racking system consists of all the components involved in fastening the modules to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations.

Solar energy generation begins with the installed solar modules converting energy from sunlight into direct current (DC) electrical power. Blocks of modules are electrically connected in series by DC cabling, which terminate at an inverter. Inverters convert the DC power from the modules to 34.5 kV AC power. Alternating Current electrical collection cables connect the inverters to the Project Substation where the power is then stepped-up by a transformer from 34.5 kV to 161 kV which is the voltage of the existing transmission infrastructure associated with the SMMPA Hayward-Murphy Creek 161 kV HVTL.

Image 1: Typical Solar Tracker Row Design

3.1.1 Photovoltaic Arrays and Solar Field

The solar array at the Project will consist of PV solar panel modules, a racking system, inverter skids, security fencing, and up to ten weather stations (**Figures 3 & 4**; see also **Appendix B**). The weather stations would be up to 15 feet in height. Hayward Solar proposes to use modules affixed to tracking mechanisms that would allow the modules to "track" the sun from east to west on a daily basis. The modules and tracking rack system are generally aligned in rows oriented

north and south with the PV modules 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 modules are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day (**Image 2**). The tracking rack system allows the Project to optimize the angle of the modules in relation to the sun throughout the day, thereby maximizing production of electricity and the capacity value of the Project.

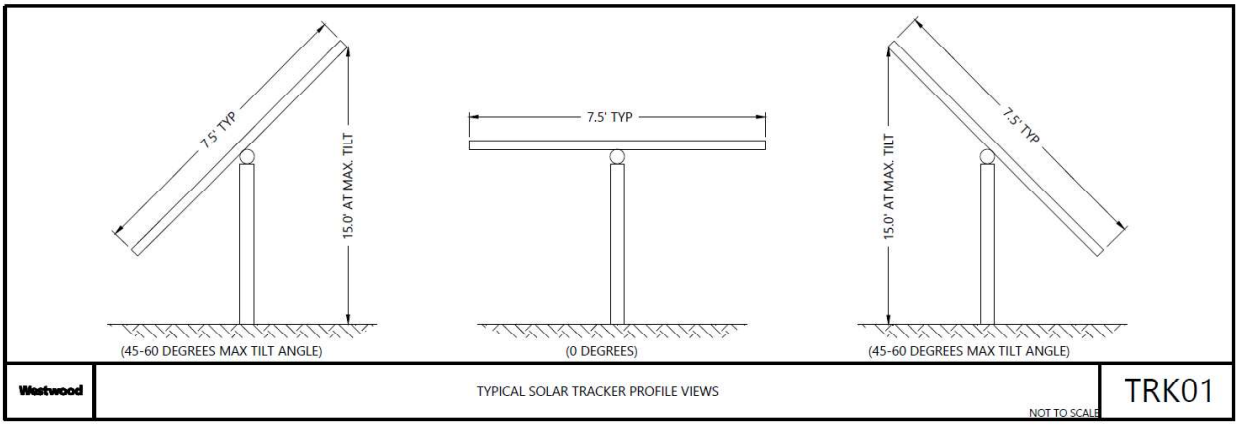

Image 2: Typical Solar Tracker Profile

When the sun is directly overhead, the PV modules 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 a maximum of 60 degrees east to 60 degrees west through the course of the day (the design tilt may vary). At the maximum 60 degrees (tilted to the highest position), the edge of the modules will be a maximum of 15 feet off the ground. The design will involve no spinning machinery, no thermal cycle, and no water use (except for infrequent module washing; see Operations and Maintenance in Section 3.3 below).

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 pending geotechnical analysis. Driven pier foundations are typically driven 8-15 feet into the ground depending on site specific soils. The depth pier foundations will be installed for the Project will be determined in final design.

A specific solar module has not yet been selected for the Project. Several Tier 1 manufacturers are under consideration, including modules manufactured by Jinko, Canadian Solar, First Solar, Hanwha, JA Solar, LONGi, Risen, Seraphim, Talesun, and Trina. All modules under consideration are mono- or poly-crystalline models. Hayward Solar will consider the costs and performance of each technology option as well as environmental and safety standards when making its final selection. This process has been included in the proposed Project timeline and the final selection should not alter the Project scope, timeframe or budget. Several racking and tracker vendors 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. Racking infrastructure and trackers will be selected closer to the procurement stage to ensure performance standards are met.

New solar modules are being introduced to the market regularly (e.g., higher efficiency or higher wattage per module options). As such, 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.

3.1.2 Project Substation

The Project Substation is proposed in the northwestern part of the Project boundary (**Figures 2 & 3**). The Project Substation is estimated to occupy approximately 0.7 acres of land. The Project Substation will consist of high voltage electrical structures (i.e., poles), breakers, a 34.5/161 kV step-up transformer, metering and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and SMMPA.

Underground 34.5 kV collector lines from the Project inverters will deliver solar generated energy to the Project Substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 161 kV by the transformer located at the Project Substation and transmitted to the new SMMPA Switchyard via the 200-300 long overhead Project Gen-Tie Line in a single span between deadend structures (**Image 3**).

Image 3: Typical A-Frame Deadend Structure

The current design includes a set of A-frame deadend structures (up to 100 feet in height) located within the Project Substation site and in the new SMMPA Switchyard which will be connected via conductors in a single short span (**Image 3**). Final layout and design of these facilities may require use of intermediate tangent structures if the span length is increased from what is expected at this time. In that case, a single dead-end structure will be located within the Project Substation and additional tangent pole structures will carry the Project Gen-Tie Line from the Project Substation to the SMMPA Switchyard. The number of poles and length of Project Gen-Tie Line are pending final engineering and design. The tangent structures will likely be made of wood or metal and will be 60-90 feet tall (**Image 4**).

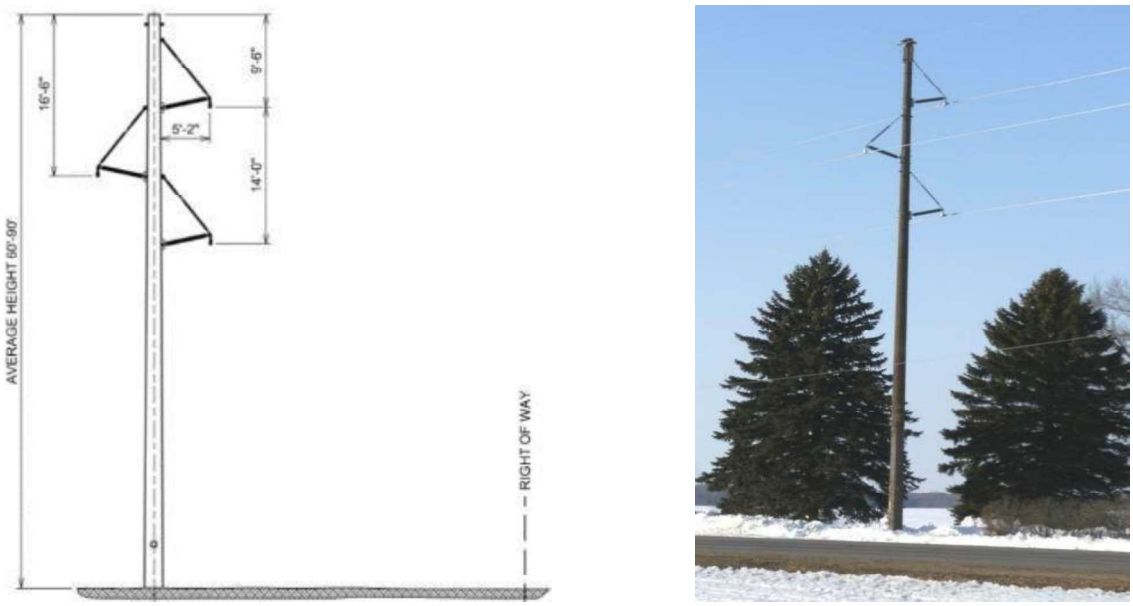

Image 4: Typical Overhead Transmission Line Structure

The type of conductor will be determined following the completion of detailed electrical design. The SMMPA Switchyard will be connected via the in/out 161 kV transmission lines to the existing Hayward-Murphy Creek 161 kV HVTL (i.e., SMMPA Line Tap). As discussed above, Hayward Solar will acquire land rights for these facilities, and SMMPA will design, permit, construct, own and operate the SMMPA Switchyard facility and any transmission line needed to connect the SMMPA Switchyard to the Hayward-Murphy Creek 161 kV HVTL.

The Project Substation location will be graded and the ground surface dressed with crushed rock, and secondary containment areas for the transformer will be installed as necessary. The fenced area of the Project Substation footprint will be approximately 150' x 200' in size (subject to final substation design and layout) and be surrounded by a minimum 30 foot buffer. The area within the Project Substation fence will be graveled to minimize vegetation growth and reduce fire risk. The substation will be fenced with an 6-foot chain-link fence topped with one foot of barbed wire in accordance with North American Electric Reliability Corporation (NERC) requirements for security and safety purposes. The Project Substation will include a parking area, secured with a lockable gate, and will be accessible to qualified, trained Project operational personnel or those escorted by such personnel at all times using the Project's access roads.

3.1.3 SMMPA Switchyard

The proposed new SMMPA Switchyard will be used to interconnect the Project to the existing SMMPA transmission line. The existing SMMPA Hayward-Murphy Creek 161 kV HVTL crosses through the northern portion of the Project Area (**Figures 2 & 3**). Soil corrections, if determined to be necessary by SMMPA, will be made as part of site clearing and preparation prior to construction of SMMPA Switchyard facilities. Foundations will then be installed and the SMMPA Switchyard area will be graded with the ground surface dressed with crushed rock. The new SMMPA Switchyard will be fenced with an 6-foot chain-link fence topped with one foot of barbed wire in accordance with NERC requirements for security and safety purposes.

The SMMPA Line Tap will be installed in a new easement area from existing SMMPA Hayward-Murphy Creek 161 kV HVTL to the SMMPA Switchyard to interconnect the Project to the grid. The length of these lines is approximately 750-900 feet and will include installation of either two deadend pole structures (for single deadends) or six deadends (for 3-pole deadends), depending on SMMPA's selected design, and required electric conductors (**Figure 3**). Hayward Solar will obtain an easement for the in/out transmission lines to the tap location and acquire land (via a purchase option agreement) needed for the SMMPA Switchyard. SMMPA will design/engineer the switching facility following SMMPA requirements and standards, permit, and construct the facility. Upon completion of these tasks, Hayward Solar will transfer the land interests associated with the new SMMPA Switchyard and transmission line easement to SMMPA who will then own and operate the SMMPA Switchyard and associated SMMPA Line Tap between the SMMPA Switchyard and Hayward-Murphy Creek 161 kV HVTL.

3.1.4 Electrical Collection System

The electric collection system components include electrical cables and accessories, conduit, inverter pads, switchgears, step up transformers, SCADA system, and metering equipment (**Figures 2-4**). Electrical wiring will connect the PV panels to inverters which will convert solar energy generated power from DC to AC. Power inverters convert approximately 1,500 volts of DC power output from the PV solar panels to between 600-690 volts of AC power depending on the inverter selected. A step-up transformer then converts the AC voltage to an intermediate voltage of 34.5 kV. Collection cables then carry the 34.5 kV power to the Project Substation (see Section 3.1.2 above). Step-up transformers are located with each of the inverters. The total length of the electrical collection system is approximately 85,000 linear feet.

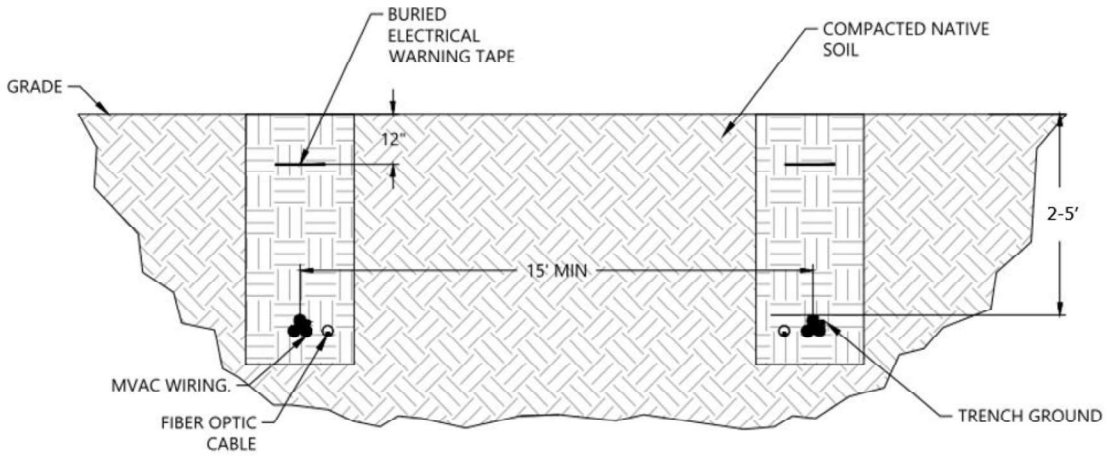

Image 5: Typical Solar Collection Trenches for Cables

The DC electrical collection cabling will be installed either below-ground, underhung beneath the PV panels and racking (i.e., CAB system), or suspended above ground via the CAB system[4]. The

[4] In this option some Project construction locations may install the CAB system on pile foundations (without racking on it) to connect the DC cables to the inverter/equipment pad.

CAB system is a cable management system that delivers a safe, strong and durable support for utility-scale wiring for ground-mount solar power generation facilities. CAB systems are quick and easy to install and provide potential labor and material cost benefits on solar projects. If buried, the underground trench will be approximately 2-5 feet deep below ground and one to two feet wide (**Image 5**). Excavation and refilling the trench will be conducted in accordance with the Agricultural Impact Mitigation Plan (AIMP - **Appendix D**).

Inverter skids will be installed at locations throughout the Preliminary Development Area. Each skid includes a DC to AC inverter and a step-up transformer to which the inverters will feed electricity (**Figure 4**). The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design proposes 48 inverter skids (see **Figure 4 & Appendix B**).

Skids provide the steel foundation for the enclosed inverter, step-up transformer, and SCADA system. The height of a skid is approximately 8-12 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 25 feet long. Concrete foundations will be poured onsite or precast and assembled off-site. The inverters skids are located within the interior fenced portion of the Project along access roads.

A specific solar inverter has not yet been selected for the Project. Several are under consideration, including units manufactured by FIMER, Power Electronics, SMA, Sungrow, and TMEIC. Hayward Solar will consider the costs and performance of each option as well as environmental and safety standards when making its final selection.

Each inverter pad will also include one or more transformers to which the inverters will feed electricity (**Image 6** which shows the DC cables buried option). Inverters convert the DC output of the PV modules to AC, which is required for delivery to the electrical grid. After the inverter has converted the electricity it is stepped-up via a transformer from low-voltage to medium or intermediate voltage (stepped up to 34.5 kV). The final number of inverters for the Project will depend on the inverter size, inverter and module availability, as well as the final array configuration. For the purposes of generation estimates, Hayward Solar has modeled the SMA Solar Technology 4200 UP-US inverter.

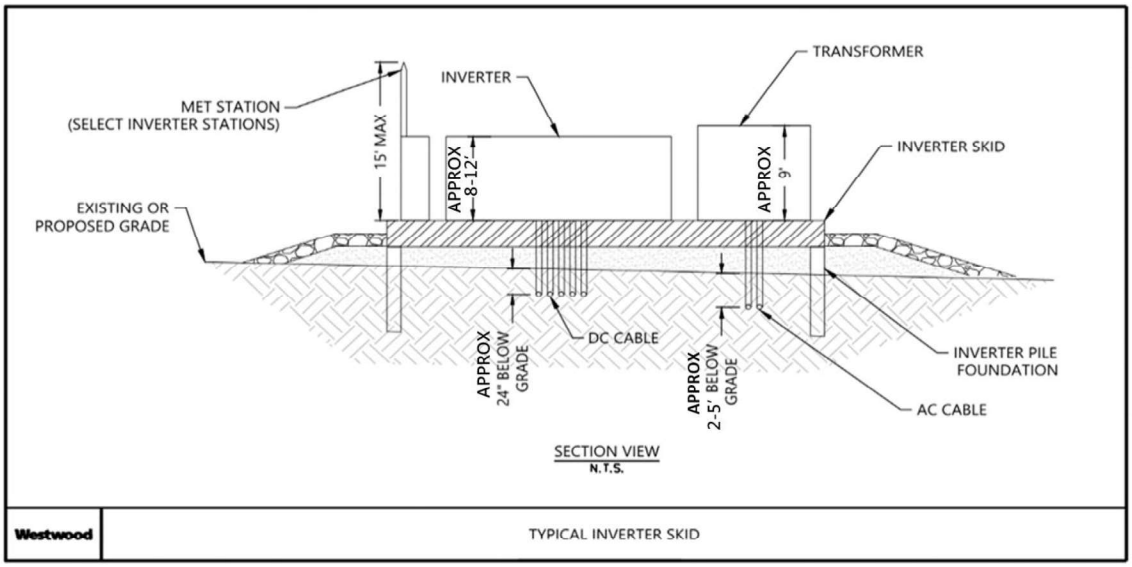

Image 6: Typical Solar Inverter Skid (DC Cables Buried Option)

The AC electrical collection system from the inverters/step-up transformer to the Project Substation will be buried between 2 to 5 feet below ground. The final type of electrical system will be determined prior to construction based on technology, availability of materials, and costs. Below-ground AC electric conductor collection lines will transfer the converted 34.5 kV AC electricity from the inverter equipment (which is assembled on skids and delivered to the Project as a package) to the Project Substation. During trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP (**Appendix D**). Once the electric conductor collection lines are laid in the trench, the trench will be backfilled with subsoil followed by segregated topsoil. Electrical collection technology is changing and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement recommendations will help determine the construction method for the electrical collection system.

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.

3.1.5 Operations and Maintenance Building

The Project will include construction and use of an O&M building (**Figures 2-4** and **Appendix B**). The O&M building will be located near the Project Substation and new SMMPA Switchyard with access from County Road 46. The O&M building will be used to conduct maintenance and repair of Project equipment and solar module components, store parts and other equipment and store other operation and maintenance supplies (e.g., materials for cleaning PV panels, etc.). The O&M building will be locked when not in use by Project staff and it will also store the SCADA system that will remotely monitor Project facilities. A parking area will be located adjacent to the O&M building for staff use. The location of the O&M facility is currently planned on 0.23-acres in the northwest portion of the Project area, north of the Project Substation location (**Figures 2-4**). During construction of the Project, temporary laydown yards/staging areas may be located near the planned O&M building site. Upon completion of Project construction, these temporary areas will be returned to their original condition if not used as part of other Project facilities.

3.1.6 Fencing

Permanent security fencing will be installed along the perimeter of each grouping of the solar arrays (see **Figure 4 & Appendix B**). Fencing will consist of a lightweight agricultural woven wire (containing wire "knots" wrapped around each intersecting wire) secured to wooden posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. The fencing will extend a maximum total height of approximately 8 feet above grade. Barbed wire will not be used at the top of the fence around the Project arrays/construction units; one to two feet of 3-4 strands of smooth wire will be used instead. "High Voltage Keep Out" signs will be placed in accordance with MNDNR and National Electric Code (NEC) requirements along the fence line. This fencing will be designed to prevent the public and larger wildlife from gaining access to solar array electrical equipment which could cause harm or injury.

To comply with the NEC, security fencing around the Project Substation will consist of 6-feet high chain-link fence with one foot of barbed wire at the top. High voltage warning signs will also be

installed on the Project Substation fence. As indicated above, a lockable gate will be installed with the Project Substation site fencing. This fencing and gate will be designed to prevent the public and wildlife from gaining access to electrical equipment which could cause injury.

3.1.7 Access Roads/Transportation System

The Project will include approximately 11.4 miles of graveled access roads that lead to the inverters and other infrastructure for O&M activities (**Figures 3 & 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 at internal road intersections (approximately 45 feet) as indicated in **Image 7**.

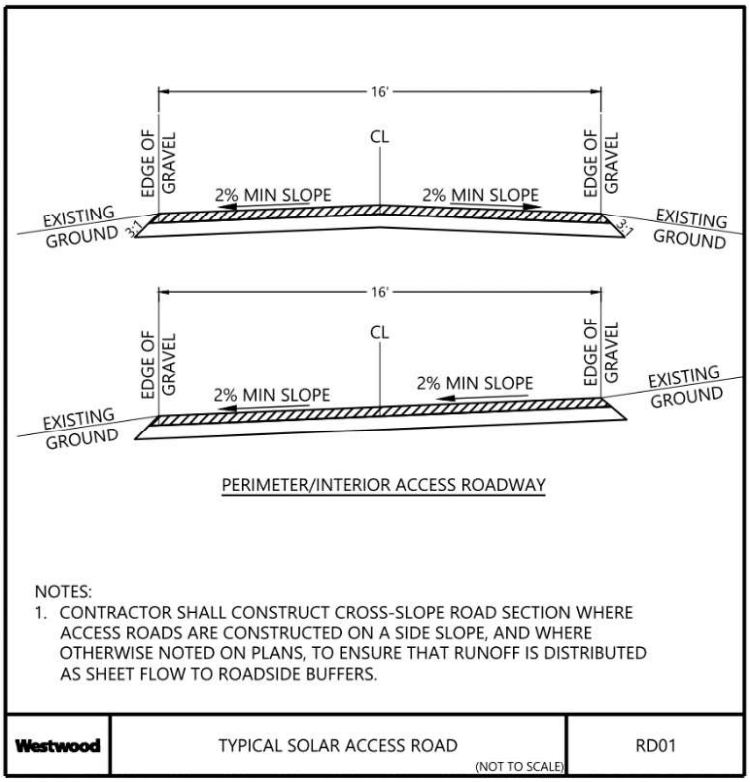

Image 7: Typical Solar Access Road Profile

Access roads may be temporarily wider during construction, and then reduced in width for long term site access upon completion. The Project Substation, new SMMPA Switchyard, and O&M building will be accessed using a newly furnished gravel road extending south from County Road 46 (E Main Street) to the Project facilities. The northern unit of the Project will be accessed from 200th Street (T-121) and T-236. The southern section will be accessed using 200th Street (T-121) and County Road 30 (850th Avenue). These proposed entrances will have locked gates.

Some upgrades or other changes to the public roads may be required for construction or operation of the Project. Hayward Solar will work with Freeborn County to facilitate upgrades to meet required standards and with landowners for final design considerations as needed. Upgrades or changes could include, but are not limited to, road improvements, additional aggregate, and driveway changes.

Hayward Solar will continue to coordinate with County and State road authorities as the Project develops. Driveway changes using Township or County roadways will require an access permit from Hayward Township or Freeborn County, respectively, which will be obtained prior to construction.

Hayward Solar will obtain relevant permits from road authorities relating to access to 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. Hayward Solar 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.

3.1.8 Pipeline System

No pipeline system will be built, accessed or needed to accomplish the Project. As no pipelines will be needed for the Project, this section is not applicable to the Application.

3.2 Project Layout

The Project's final layout will optimize electrical generation and efficiency of the proposed solar Project while avoiding and minimizing human settlement, environmental, cultural resources, and infrastructure impacts. The Project's facilities will be sited to comply with the County's setback requirements, where feasible, and will also comply with other local, state, and federal regulatory standards. The preliminary Project layout can be found on **Figures 3 & 4** (see also **Appendix B**).

3.2.1 Setbacks

As described above, the Project is considered an LEF as defined in Minn. Stat. § 216B.2421, Subd. 2(1) and an LEGF as defined in Minn R. 7849.0010, subp. 13 and is therefore permitted by the Commission under Minn. Stat. § 216E.04 and Minn. R. 7850.2800-7850.3900. In designing the Project layout, Hayward Solar reviewed applicable setbacks and related requirements. While applicable rules and regulations for siting an LEF and LEGF do not require projects to meet local ordinances, Hayward Solar tried it's best to comply with Freeborn County (County) setbacks and applicable ordinances in addition to meeting State requirements.

Because it has a nameplate capacity of more than 40 kilowatts, the Project is considered a "Solar energy system, large" (large solar energy system) under Chapter 26 of the Code of Ordinances of Freeborn County, Minnesota (Ordinance). The Project Area mainly consists of cultivated land and is zoned as Agricultural (A) according to Freeborn County Zoning information. Large solar energy systems are conditionally permitted on lands zoned A in Freeborn County.

The setback regulations and distances for large solar energy systems in the County are included in **Table 4** and also shown on the Preliminary Facility Design in **Figure 4** (also **Appendix B**). Where setbacks differed for the same feature, Hayward Solar used the most stringent setback when possible.

As indicated in **Table 4** below, the Project design setbacks meet or exceed the County's setback requirements as provided in the Ordinance (Section 26-71). Hayward Solar sited and designed the Project taking into account the County's setbacks, in addition to State requirements. As shown below, Hayward Solar meets each County setback requirement. However, land constraints such as existing gas pipeline and transmission line easements, wetlands, trees and other factors 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 Project, and dwellings not owned by a participating landowner. Hayward Solar is committed to working with the County to meet setback requirements where feasible. In addition, all MNDNR buffer requirements under Minn. Stat. § 103F.48 have been met.

Table 4: Freeborn County Setback Requirements

Setback Type	County Setback Distance (feet)	Project Design Setback (feet) (closest to array)
Property boundary/property lines	100	>100
Road right-of-way	100	>100
Other right-of-way (railroads, power lines, recreation trails, etc.)	50	>50
Public Conservation Lands	100	>100
Wetlands, USFWS types III, IV, & V	100	>100
Public drainage ditch	50	>50
Public drainage tile	30	>50
Primary structure on adjacent properties in R-H, R-1, and R-2 zones	N/A	N/A
Primary structure on adjacent properties in "A" zone	750	>750
Primary structure on adjacent properties in PD, I, B-1, and B-2 zones	500	>500
Municipality, residential zone, campgrounds, churches, health care facilities	500	>500

N/A – not applicable.

In addition to the above County setbacks, additional standards are applicable to large solar energy systems as provided in Ordinance Sections 26-72, 26-74, 26-77, 26-78, and 26-80; Hayward Solar will work with the County in designing and constructing the Project to meet these County standards when practicable. These standards refer to general design and impact mitigation standards, as well as decommissioning standards.

Additionally, Hayward Solar implemented their own internal setback best management practices into the Project design as detailed in **Table 5**. Setbacks are calculated as the distance from the nearest solar array (**Figure 4** and **Appendix B**).

Table 5: Hayward Solar Initiated Setbacks

Setback Type	Project Design Setback (feet) (closest to array)
Non-participating off-property (not north of array)	100
On-property large tree lots	100

3.2.2 Project Development Area

Table 6 describes the Project facilities' estimated acreage within the approximately 1,272-acre Preliminary Development Area based on the preliminary design configurations (**Figures 2-4**).

Table 6: Estimated Project Facility Acreages in Preliminary Development Area

Project Facilities	Acres
Access Roads	22.74
Inverters	0.59
Project Substation	0.69
SMMPA Switchyard	2.32
Project O&M Building	0.23
Temporary Laydown Areas	10.0 - 15.0
Solar Modules (excludes vegetated spacing between modules)	965.9
Collection Lines	26.76
Sediment Basins, Riprap, Berms	13.73
Unused Area (acreage within the Preliminary Development Area with no facilities, including vegetated spacing between modules)	224.34-229.34
Project Total	**1,272.30**

3.3 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. Pre-construction activities will be completed between submittal of this Application and the start of construction. Pre-construction, construction, and post-construction activities for the Project include:

- Pre-construction
  - Geotechnical investigation;
  - Underground utility identification and location;
  - Design Project Substation;
  - Design solar array, access roads, and electric collection system; and
  - Procure necessary facility components (solar modules, tracking system, inverters, and transformers).
- Construction
  - Site preparation, grubbing, and grading;
  - Construct laydown areas and set up temporary job site trailers;
  - Civil construction of access roads;
  - Construct fencing;
  - Install PV pile foundation posts;
  - Tracker installation;
  - PV module installation;
  - Install below-ground or above-ground collection system;
  - Install electrical enclosure/inverter; and
  - 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 facility; and
  - Begin commercial operation.

3.3.1 Construction and Construction Management

Construction will begin after the necessary permits are received and the electrical interconnection process is finalized with MISO. Project 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 18.9 acres of the total Project Area will require grading (**Figures 3 & 4** and **Appendix B**). A total of 2,700 cubic yards of cut and fill is estimated for the Project arrays. Cut and fill volume estimates for the access roads, basins, inverter pads, substation, and SMMPA Switchyard are pending. Mass grading of the site will not be employed and will generally occur to "flatten" various areas of the site to facilitate installation of modules, inverters, access roads and the Project Substation and as provided in the AIMP.

In this first phase of construction, general site improvements will be made such as access improvements and preparation of the staging/laydown areas. Temporary staging/laydown areas will be approximately 10-15 acres and will be located in the northwestern portion of the Project Area near the proposed Project Substation, SMMPA Switchyard, and O&M building. The staging/laydown areas will be used for storage of construction materials and shipped equipment containers, receiving construction deliveries, and temporary parking for Project-related vehicles. Temporary construction offices will also be located onsite during construction.

The solar energy system (solar arrays and collection and distribution systems) will be installed next in conjunction with access roads within the arrays. The Project 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 with the grading that will be completed for other areas of the Project. 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 include stringing the electrical wires, installing the perimeter fence, and placing course, clear crushed rock throughout the interior of the fenced area and three feet outside the fence.

The SMMPA SMMPA Switchyard will be constructed simultaneously with substation construction. The SMMPA Switchyard may require minimal amounts of grading, which will be completed by SMMPA, if needed. The structures used for the SMMPA Switchyard will be determined by SMMPA, but will likely be made of wood or metal and will be less than 100 feet tall. The overall length of the proposed SMMPA Line Tap connecting the new SMMPA Switchyard to the existing Hayward-Murphy Creek 161 kV transmission lines is approximately 750-900 feet. The final activities for the SMMPA Switchyard will be connecting the Project to the regional transmission grid, as discussed in Sections 3.1.2 and 3.1.3.

An O&M building will be constructed in accordance with the procedures noted in Section 3.1.4. The 0.23-acre O&M facility will be located adjacent to the Project Substation and SMMPA Switchyard and will be constructed on the same timeline as the substation and SMMPA Switchyard.

Onsite construction personnel will consist of laborers, craftspeople, supervisory personnel, construction management personnel, civil and construction trades, as well as administrative and support staff. Hayward Solar will issue a Request for Proposal (RFP) to an Engineering, Procurement and Construction (EPC) contractor to construct the Project. Hayward Solar 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 selected EPC contractor 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 204 jobs during the construction and installation phases, and up to 10 indirect and 4 full time jobs during the operations phase.

Hayward Solar 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; and
- Truck-mounted auger or drill rig.

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

3.3.2 Commissioning

Equipment inspections will be conducted prior to commercial operations of the proposed 150 MW AC Project and in compliance with applicable SP requirements. Inspection and testing will occur for each component of the solar array, as well as the associated communication, meteorological, collection, and SCADA systems. Testing, inspections and commissioning will occur at periods during construction and upon completion of the construction phase.

3.3.3 Restoration

As portions of the Project near completion, temporary staging and laydown areas and other temporary disturbance areas will be restored. The Project 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 Vegetation Management Plan (VMP) (**Appendix E**) and the Stormwater Pollution Prevention Plan (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 yards) 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. Hayward Solar anticipates that the post-construction clean-up and site restoration activities will take approximately two to four 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/sedimentation. The required restoration management is designed to continue for three 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 Project 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 three 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 may be used when vegetation reaches a height of approximately 20 inches to bring it back to a height of roughly 6-8 inches and will 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, sheep may be used experimentally where grazing proves to be a more viable long-term management strategy, if feasible.

3.3.4 Operation and Maintenance

Following commissioning and commercial operation, the care, custody, and control of the Project facilities 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 Project. 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 Project will be professionally maintained and operated by Hayward Solar, an affiliate or a qualified contractor. Primary tasks include scheduled monthly and quarterly inspection(s) of electrical equipment, vegetation management as well as snow removal on access drives, as needed.

The expected service life of the Project is 30-35 years or longer based on the useful commercial lifespan of modules, and Hayward Solar estimates that the Project will result in up to two full-time positions to operate and maintain the Project facilities. A maintenance plan will be created for the Project 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 Project's life cycle. Like all technology and physical components, a certain amount of this is unavoidable and Hayward Solar

will plan for it and maintain the facility as needed. Once construction is complete the solar facility is expected to 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 7** in Section 3.3.4.5 below.

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 Project 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 modules to operate during an unscheduled outage of the tracker system.

The generating facility will be operated through a real-time control system for most operations functions, discussed further in Section 3.3.4.1.

3.3.4.1 Supervisory Control and Data Acquisition System

Performance monitoring of the Project will consist of a real-time and continuous assimilation of the data acquired by the onsite meteorological station, energy meter and SCADA. The SCADA system provides data on solar energy 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.

3.3.4.2 Equipment Inspection

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

- PV modules: visual check of the modules, tracking system and surrounding grounds to verify the integrity of the modules 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); and
- Solar Project Substation: scheduled visual inspections.

3.3.4.3 Performance Monitoring

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

3.3.4.4 Facility Maintenance

Housekeeping of the Project facilities will include access road maintenance, vegetation maintenance (method is to be determined based on plant design and the VMP; either traditional mowing, herbicides, or if feasible, sheep grazers will be used), fence and gate inspection, lighting system checks, and PV module washing at Hayward Solar's direction (if required - minimal to no PV panel washing is anticipated to be needed for the Project).

3.3.4.5 Maintenance Frequency

Table 7 provides more information on the anticipated frequency of the operations and maintenance tasks associated with the Project. The table represents the anticipated preliminary frequency of these tasks; the frequency of inspection may be varied based on facility demands and experience with performance of certain components and Project features.

Table 7: Project Operations & Maintenance Tasks and Frequency

Plant Device	Task	Preliminary Frequency
Photovoltaic (PV) Field	PV Panels visual check	Once Yearly
	Wiring and junction boxes visual check	Once Yearly
	Overview aerial thermal scan	Once Yearly
	Advanced diagnostics	At Owner's Direction
	PV strings and sting boxes faults	Once Yearly
	PV modules washing	No regular washing planned (only as site-specific conditions warrant)
	Vegetation Management (if necessary at site)	Up to three times a year depending on site conditions, and compatible with plant design and the VMP.
Electric Boards	Case visual check	Once Yearly
	Fuses check	Once Yearly
	Visual Torque check	Once Yearly
	Grounding check	Once Yearly
Inverter	Case visual inspection	Once Yearly
	Air intake and filters inspections	Once Yearly
	Conversion stop for lack of voltage	Once Yearly
	AC voltage and current check	Once Yearly
	Fuses check	Once Yearly
	Visual Torque check	Once Yearly
Support Structures	Visual check	Once Yearly
Photovoltaic (PV) Field	PV Panels visual check	Once Yearly
	Wiring and junction boxes visual check	Once Yearly
	PV strings measurement of the insulation	Once Yearly
	PV strings and sting boxes faults	Once Yearly
	PV modules washing	No regular washing planned (only as site-specific conditions warrant)

Plant Device	Task	Preliminary Frequency
	Vegetation Management (if necessary at site)	Up to three times a year depending on site conditions
Electric Boards	Case visual check	Once Yearly
	Fuses check	Once Yearly
	Surge arresters check	Once Yearly
	Torque check	Once Yearly
	DC voltage and current check	Once Yearly
	Grounding check	Once Yearly
Inverter	Case visual inspection	Once Yearly
	Air intake and filters inspections	Once Yearly
	Conversion stop for lack of voltage	Once Yearly
	AC voltage and current check	Once Yearly
	Conversion efficiency inspection	Once Yearly
	Data logger memory download	Once Yearly
	Fuses check	Once Yearly
	Grounding check	Once Yearly
	Torque check	Once Yearly
Support Structures	Visual check	Once Yearly
	PV modules torque check on random sample	Once Yearly

3.4 Decommissioning and Repowering

At the end of the Project's useful life Hayward Solar 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. A Project decommissioning plan is included in **Appendix F**.

3.4.1 Decommissioning

At the end of commercial operations, Hayward Solar will be responsible for removing all of the solar arrays and other associated facilities. At the end of the Site Permit terms, Hayward Solar reserves the right to extend operations of the Project by applying for an extension of the permit, if necessary, and continuing operation. Should Hayward Solar 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 Project at the end of its useful life (approximately 35 years or longer) would include removing the solar arrays (modules, racking and steel foundation posts), inverters, fencing, access roads, above-ground portions of the electrical collection system, lighting, substation, transmission and the O&M building. 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 is provided in **Appendix F** and is generally summarized below.

3.4.1.1 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.

3.4.1.2 Financial Resource Plan

Hayward Solar will be responsible for all costs to decommission the Project and associated facilities. Because of the uncertainty in predicting future decommissioning costs and salvage values, Hayward Solar will review and update the original decommissioning plan approved by the Commission in the 15th year. At that time, Hayward Solar will either enter into a surety bond agreement and create an escrow account or create a reserve fund for decommissioning purposes. Hayward Solar will abide by the applicable SP condition(s) and ensure the Project is decommissioned in accordance with the SP. In addition to MPUC permit conditions, Hayward Solar has included an obligation to decommission the Project components in applicable real estate agreements.

3.4.1.3 Removal and Disposal of Project Components

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

- **Modules:** Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed and shipped to an offsite facility for reuse or resale. Non-functioning modules 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 up to a depth of four feet. 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 project and taken to a recycling facility. Underground cables below a depth of four feet will be left in place;

- **Inverters, Transformers, and Ancillary Equipment:** All electrical equipment will be disconnected and disassembled. All parts will removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Hayward Solar's sole discretion, consistent with applicable regulations and industry standards;

- **Equipment Foundation and Ancillary Foundations:** The ancillary foundation for Hayward Solar 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 full depth. 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 of approximately 90 percent of Standard Proctor density. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Hayward Solar'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 Hayward Solar's sole discretion, consistent with applicable regulations and industry standards. The surrounding areas will be restored to pre-construction conditions to extent feasible; and

- **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 Hayward Solar unless otherwise restricted by federal, state, or local regulations; and
    2. If a road is to be removed, aggregate will be removed and shipped from the site to be reused, sold, or disposed of appropriately, at Hayward Solar'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. 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 to a depth of approximately 18 inches using a chisel plow or other appropriate subsoiling equipment. All rocks larger than four inches will be removed. Topsoil that was stockpiled during the original construction will be distributed across the open area. The access roads and adjacent areas that are compacted by equipment will be de-compacted.

Restoration/Reclamation of Facility

Hayward Solar will restore and reclaim the site to approximately the pre-construction condition consistent with the requirements of the Project lease agreements. Hayward Solar 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 use is identified, Hayward Solar will vegetate portions of the site disturbed by decommissioning activities with a seed mix meeting the requirements of the landowner. The goal of restoration in that instance will be to maintain natural hydrology and the plant communities growing on the site during operation of the Project to the greatest extent practicable while minimizing new disturbance and removal of native vegetation.

The decommissioning effort will implement best management practices (BMP's) to minimize erosion and to contain sediment on the Project to the extent practicable with the intent of meeting this goal include:

1. Minimize new disturbance and removal of native vegetation to the greatest extent practicable;

2. Removal of solar equipment and all access roads up to full depth, backfill with subgrade material and cover exposed subgrade material with suitable topsoil as necessary to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements;
3. Any topsoil that is removed from the surface for decommissioning will be stockpiled to be reused when restoring plant communities or when restoring agricultural uses. Once decommissioning activity is complete, topsoil will be re-spread to assist in establishing and maintaining perennial or annual plant communities, depending on the ongoing planned uses of the property;
4. Stabilize soils and return them to agricultural use or other beneficial use according to the landowner direction;
5. During and after decommissioning activities, install erosion and sediment control measures, such as silt fences, bio-rolls, and ditch checks in all disturbance areas where potential for erosion and sediment transport exists, consistent with storm water management objectives and requirements; and
6. Remediate any petroleum product leaks and chemical releases prior to completion of decommissioning.

Decommissioning and restoration activities at each site will be completed within 12 months after the end of commercial operations.

3.4.1.4 Post-Restoration Monitoring

Decommissioning of the Project site will comply with permits for National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater (CSW) 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, Hayward Solar'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.

3.4.2 Repowering

As the solar market continues to produce less expensive and more efficient solar modules, repowering the Project may be a viable option as the Project ages. Potential triggers for initiating a repower may be aging or faulty equipment, maintenance costs, extending the useful life of the Project, or increasing the generation output of the Project. Hayward Solar will continually evaluate the Project's generation output, maintenance costs, and other contributing factors in conjunction with available technology upgrades to determine if repowering the Project is a worthwhile investment. Any proposed repowering of the Project will abide by all local, state, and federal regulations. A new site permit application may be necessary and will be sought out if required.

4.0 Environmental Information

For existing conditions within the portions of land under Hayward Solar's control, area calculations are based on the Project Area (1,958 acres **– Figure 1**). This reflects the fact that final design may necessitate development in areas within the overall Project Area and not simply the Preliminary Development Area as previously defined (**Figure 2**). Additionally, for any discussions of resources that are located outside of the facility (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.

For approximating areas of temporary impact from the proposed solar facilities, the Preliminary Development Area is used (approximately 1,272 acres), which is the area needed for construction and operation of the facility based on preliminary design. To create the 1,272-acre Preliminary Development Area the following buffers were used on layout features to assess impacts and mitigative measures in the following sections:

- Access Roads – 20 foot;
- Array Fence Boundaries – 20 foot;
- Collection Lines – 25 foot;
- Transmission Line – 25 foot; and
- Utilities (O&M building, Project Substation, SMMPA Switchyard) – 50 foot.

4.1 Environmental Setting

The Hayward Solar Project is located within the political boundaries of Hayward Township in Freeborn County, Minnesota (**Figure 1**). The Project is located in a rural area approximately two miles east of the City of Hayward. Residences are scattered throughout the rural area where the land use is dominated by agricultural fields (predominately corn and dry beans planted in row crops). The Project Area is located on approximately 1,958 acres of land, immediately adjacent to the SMMPA's existing Hayward-Murphy Creek 161 kV HVTL (**Figures 1 & 2**). The Project is located on relatively flat fields conducive to solar energy generation development.

With the exception of I-90 (the interstate highway which creates a boundary to the Project's north) roads that surround the Project Area are local county or township roads. The Project Area is bordered on the west by 830th Avenue on the West, County Road 30 to the East, and 199th Street to the South. It is intersected by County Road 46 in the Northwest corner, 840th Avenue runs through the middle of the Project going north-south, and 200th Street intersects the Project through the middle going east-west. SMMPA's existing Hayward-Murphy Creek 161 kV HVTL goes directly through the northwestern section of the Project Area, allowing for a direct line connection through the proposed connection transmission line and new SMMPA Switchyard (**Figures 2 & 3**).

According to the National Resources Conservation Service (NRCS) Land Resource Region and Major Land Resource Area (MLRA), the Project site is located within the northern part of the Central Feed Grains and Livestock Region and the East Iowa and Minnesota Till Prairies (USDA, 2019). This MLRA is in the northwestern part of the till prairies and is characterized by Eastern Iowa and Minnesota Drift Plains, rolling loess prairies, lower St. Croix and Vermillion valleys, and Rochester/Paleozoic Plateau Upland. The area is generally flat, agricultural land with few wooded areas. The nearest section of the Albert Lea Lake is located approximately three miles away from the northwestern boundary of the Project. Drain tiles are located in the northwestern corner of the Project Area and ditches are located along 840th Avenue, 830th Avenue, 200th Street, and 199th Street (**Figures 4 & 6**).

The MNDNR and the U.S. Forest Service (USFWS) 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, 2020). Through the ECS, the State of Minnesota is split into

Ecological Provinces, Sections, and Subsections. The Project site is located within the Minnesota and Northeast Iowa Morainal Section of the Eastern Broadleaf Forest Province (222M). The Project is located in the Oak Savanna Subsection.

The Oak Savanna Subsection is part of a loess plain over bedrock or till in South-Eastern Minnesota and North Eastern Iowa. Elevation ranges from 300 to 400 meters. 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, 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, 2020).

4.2 Human Settlement

4.2.1 Public Health and Safety

The Project is located in rural Hayward Township, Freeborn County, MN which according to the 2010 United States Census Bureau (U.S. Census), has a population density of 12.7 persons per square mile of land area (U.S. Census Bureau, 2010). Hayward Township has a total area of 35.6 square miles and a population of 438 persons. If emergency personnel were needed at the Project, multiple agencies would likely respond, depending on the situation. These include the Freeborn County Sheriff, Hayward volunteer fire department, services from Albert Lea including the fire department, Marathon Health Hospital ambulance, and police department from Austin, all of which are within approximately 1.7 to 12 miles of the Project Area.

There are three towers that are a part of the Allied Radio Matrix for Emergency Response (ARMER) in Freeborn County (Minnesota Department of Public Safety, 2018). These ARMER towers are a part of Minnesota's Statewide Communication Interoperability Plan which aims to improve communication for emergency responders. The ARMER radio system operates by line of sight, talking to other ARMER towers. In order for the system to operate effectively multiple towers are needed to produce a solid blanket of coverage. The system can be interrupted if tall objects are proposed within the line-of-sight, typically at or near the top of a tower over 150 feet tall. There are no ARMER towers within one mile of the Project Area; the nearest ARMER tower is located in Oakland Township which is approximately five miles east of the Project (Minnesota Department of Public Safety, 2018).

While a Phase I Environmental Site Assessment (ESA) has not yet been conducted for the Project, Hayward Solar completed a Critical Issues Analysis (CIA) which included review of environmental records (i.e., an EDR environmental records data request) of the Project Area. The EDR report provided a review of federal, state, regional, and local records to assess whether the Project Area or facilities within the study area have experienced significant unauthorized releases of hazardous substances or other events with potentially adverse environmental effects[5].

[5] EDR performed a database search of the Project Area in accordance with the ASTM E 1527-13.

A review of facilities listed within the EDR (EDR Area/Corridor) Report was conducted and identified the following:

- The Project Area was not listed in any databases; and
- Nearby facilities within the study area were included in the following databases:
    - Three facilities in the MPCA "What is in My Neighborhood" (WIMN) database, which provides information about air quality, hazardous waste, remediation, solid waste, tanks and leaks, and water quality around Minnesota -
        - Crestwhite Hogs and Marshfield Enterprises, LLC are located approximately 0.16 miles and 0.45 miles, respectively, from the Project Area. Both facilities are identified as active feedlots. Neither of these locations are associated with a spill or release.
        - Alliance Pipeline–Albert Lea 25 facility is located approximate 0.37 miles east of the Project Area. The facility appears to be associated with an existing pipeline that which trends northwest-southeast through the northern portion of the Project Area (**Figures 4 & 6**). The WIMN database listing is for air quality and hazardous waste. This location has a Part 70 Air Permit issued from the MPCA. No violations are reported. This facility is also listed in the Air Permit (AIRs) database, which tracks facilities with air permits, and the Tier 2 database, which includes facilities that store or manufacture hazardous materials that submit a chemical inventory report. The AIRs database pollutants include volatile organic compounds, carbon monoxide, carbon dioxide, nitrogen oxides PM10, sulfur dioxide, and lead. The Tier 2 database listing for this location is indicated for sulfuric acid.

In addition to the three locations above, the EDR report identified seven "orphan" facilities (facilities which, because of poor or inadequate address information, could not be mapped by EDR). Six of the seven orphan sites are listed in the city of Albert Lea, outside of the study area. The seventh orphan facility is listed in the Spills database (Spills), which track releases reported to the MPCA. The listed address of the incident is the City of Hayward. No additional information was available related to date of the release, location, substance, quantity, or incident status of this spill.

As part of the CIA, the National Pipeline Mapping System (NPMS) was searched to assess whether pipelines are present in the Project Area and study area (NPMS 2019). The NPMS Public Viewer enables the user to view NPMS pipeline, liquefied natural gas plant and breakout tank data one county at a time, including attributes and pipeline operator contact information. The user can also view gas transmission and hazardous liquid pipeline accidents and incidents going back to 2002 for the entire US. NPMS pipeline data consists of gas transmission pipelines and hazardous liquid pipelines jurisdictional to Pipeline and Hazardous Materials Safety Administration.

Review of the NPMS data identified the following facilities:

- A crude oil pipeline is present transecting the Project Area northwest-southeast through the northern half of the Project Area (**Figure 6**). The pipeline is identified as "Masonville to Lerdal" and is operated by Kinder Morgan Cochin, LLC. No releases were identified within the NPMS Map Viewer; and

- A natural gas pipeline is present parallel to the crude oil pipeline and also transecting the Project Area northwest-southeast through the northern half of the Project Area (**Figure 6**). The pipeline is identified as "1" and is operated by Alliance Pipeline L.P. No releases were identified within the NPMS Map Viewer. This pipeline is in the approximate location of the Alliance Pipeline identified by EDR.

In addition to the EDR Report, Westwood accessed the MPCA "What's in your Neighborhood" website on January 14, 2021. This online application offers a way to access a wide variety of environmental information about a given site and location. The website provided data on:

- Potentially contaminated sites - Since the early 1980s when major federal and state cleanup programs were created, the MPCA has been aggressively searching for and helping to clean up contaminated properties, from very small to large. This website contains a searchable inventory of those properties, as well as sites that have already been cleaned up and those currently being investigated or cleaned up; and
- Environmental permits and registrations - This Web application also contains a searchable inventory of businesses that have applied for and received different types of environmental permits and registrations from the MPCA.

Review of the January 14, 2021 MPCA "What's in your Neighborhood" search indicates there are no records within the Project Area. Fifteen (15) records were noted near the Project Area and are summarized in **Table 8** below and shown in **Figure 5**.

Table 8: MPCA Sites within Project Vicinity

MPCA Site ID	Site Name	Site Status	Program Name
59062	Hartman Farm #102	Inactive	Feedlots
58870	Emily Cech Farm	Active	Feedlots
123449	Marshfield Enterprises LLC	Active	Feedlots
88960	Crestwhite Hogs	Active	Feedlots
88430	Rocking Pine Ranch	Active	Feedlots
58865	Lyle Family Farm - Sec 18	Inactive	Feedlots
4949	Alliance Pipeline - Albert Lea 25-A	Active	Multiple Programs
154904	Dan Matz property	Active	Solid Waste
213892	Oyer Trucking and Pumping, LLC	Active	SSTS
224874	SP 2482-74	Active	Stormwater
233670	Dairyland N-410	Active	Stormwater
235153	Austin MP 12.25 Replacement (WO 01097995)	Active	Stormwater
151050	Blazing Star Trail	Active	Stormwater
3368	Hayward WWTP	Active	Water Quality
119059	Albert Lea/Austin KOA Campground	Active	Water Quality

None of these sites are expected to have an adverse effect on the Project.

Impacts and Mitigative Measures

Construction and operation of the Project will have minimal impacts on the security and safety of the local populace and the level of use/service potentially needed by the Project is expected to be low. The Project is being engineered and designed, and will be constructed to meet applicable NSC, MISO, SMMPA, state and local electrical standards and therefore will pose a minimal safety and security risks to the public. As discussed in Section 3.1.6 above, the Project arrays will be fenced/secured and access allowed for authorized personnel via lockable gates. The Project

Substation and SMMPA Switchyard will also be fenced with controlled/locking access gates. Signs will be posted to warn unauthorized persons not to enter fenced areas and of the presence of electrical equipment associated with Project facilities.

While it is possible that portions of the Project facility (e.g., arrays, etc.) could be damaged or affected by extreme weather events, the Project will be designed and constructed such that Project materials are not expected to leave the Project site. Hayward Solar will regularly inspect the Project for damage and, if found, will repair or replace impacted materials and dispose of generated waste in accordance with applicable requirements.

Hayward Solar takes health and safety of its Project team and partners seriously and requires all parties involved with the Project to implement well-developed, comprehensive health and safety plans and protocols. While difficult to quantify, during construction an emergency incident or accident may occur and would be addressed as needed by Project personnel and local responders (as required).

Hayward Solar is gathering information to coordinate with all emergency and non- emergency response teams for the Project, including law enforcement agencies (Freeborn County Sheriff, Albert Lea and Austin Police Departments), Hayward Volunteer Fire Department, Albert Lea and Austin Fire Departments, Albert Lea Medical Center/Mayo Clinic Health System, Austin Medical Center, ambulance services from Mayo Clinic Ambulance Service and 911 services. The type and number of responding agencies will depend on the incident requiring emergency services.

For construction and operation of the Project, Hayward Solar 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 contractors will be required to comply with local, state, and federal regulations regarding installation of the Project facilities and use standard construction-related health and safety 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 all Project facilities to prevent public access.

While there are ARMER towers in the Project vicinity (i.e., within 5.0 miles), the Hayward Solar Project will not impact this communication system as Project facilities are proposed well below the typical height of a tower and line-of-sight near the top of these towers (i.e., greater than 150 feet above ground). Hayward Solar anticipates the tallest Project facility to be the transmission line poles and associated conductors that will connect the Project Substation/SMMPA Switchyard to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL which include 2-4 poles that will be from 60-90 feet in height and approximately 750-900 feet in length (i.e., SMMPA Line Tap) depending on final Project design. The Project solar array panels will be no more than 20 feet in height and not impact the ARMER system. As such, no mitigation concerning the ARMER system is proposed.

Review of environmental records in the EDR Report and MPCA database indicated no sites located within the Project Area. A number of sites are located in the vicinity of the Project Area, though none are expected to impact the Project. Prior to construction Hayward Solar will conduct a Phase I ESA of the Project Area to confirm these findings and refresh review of potential environmental site impacts to the Project.

4.2.2 Displacement

As previously indicated, the Project is located in an agricultural area with relatively few residences and widely dispersed farmsteads among row crop farm fields. Two locations within the Project Area contain farming operations (one includes a farmstead). The farmstead is located within the southwest corner of the Project Area north of the intersection of 190th Street and 840th Avenue (**Figures 2-4**). This is the Thompson farmstead and the occupants are participating landowners in the Project; it includes a home, barn and several outbuildings, silos and several grain storage bins. The farmstead is surrounding by trees and vegetation on the south, west and north sides of the farmstead. The outbuildings, storage bins, barn, and silos are located north, northeast and east of the home at the site. The home is located approximately 680 feet southwest of the nearest point to the Project Area. The Project will not displace or require removal of any part of this farmstead.

The second location contains an area with grain storage bins and handling equipment which is located south of County Road 46 and southwest of the I-90/CR 46 interchange (**Figures 2-4**). The grain storage/handling area is used for agricultural production and is occupied only during certain times during the year for this purpose. The landowner of this parcel is participating in the Project and Project facilities (Project Substation, new SMMPA Switchyard, O&M building and transmission line facilities) are being planned in the vicinity of the existing structures. The Project will not displace or require removal of any part of this grain storage/handling area.

Impacts and Mitigative Measures

Because the Project will not displace or require removal of any part of the existing farmstead or grain storage/handling area located within the Project Area, no mitigation is proposed. To mitigate potential impacts to these areas and land uses, Hayward Solar is and will continue to work with the participating landowners and coordinate the Project design and construction to ensure the Project will not interfere with existing facilities.

4.2.3 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 decibel 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.

Common sound sources within an agricultural and/or rural environment such as the Project Area include, but are not limited to, sound from farm equipment such as tractors and combines, farm support vehicles and equipment, grain handling/storage/drying operations, sound generated from traffic on surrounding roadways, sounds from birds, and wind rustling through the vegetation. Typically the ambient acoustic environment of a rural or agriculturally-oriented community has continuous sound levels (Leq, which is an energy-based time-averaged noise level) ranging from 30 dB(A) to 60 dB(A) (CDC, 2019). According to ANSI/ASA S12.9-2013/Part 3, rural residential areas have a typical daytime noise level of 40 dB(A) and a typical nighttime noise level of 34 dB(A).

Background noise in the vicinity of the proposed Project facilities is typically a result of farming equipment/operations, wind, and vehicles. The Project Area is situated south of and adjacent to I-90, a major interstate highway that crosses southern Minnesota from east to west (**Figures 2-4**). An inactive Gavilon Grain LLC rail line crosses through the northern portion of the Project which is adjacent to County Road 46. A number of smaller local roads are located around and within the Project Area. A Freeborn County Trails snowmobile trail crosses through the center portion of the Project Area (along township road T-236) and along the northern Project Area border (south of and adjacent to I-90) as shown in **Figure 6**. Each of these infrastructure involve transportation and recreation activities of motorized vehicles that emit noise during various time of the day and year including, but not limited to, agricultural machinery, commuter traffic, snow mobiles, animal and insect activity, and landscaping activities. Additionally, SMMPA's Hayward-Murphy Creek 161 kV HVTL and a number of overhead electric distribution lines cross through and near the Project Area. A comparison of typical noise-generating sources is outlined below in **Table 9**.

Table 9: Common Noise Sources

Sound Pressure Level (dB(A))	Common Noise Source
110	Rock band at 5 m
100	Jet flyover at 300 m
90	Gas lawn mower at 1 m
85	Food blender at 1 m
75	Shouting at 1 m
70	Vacuum cleaner at 3 m
60	Normal speech at 1 m
55	Large business office
50	Dishwasher in next room, quiet urban daytime
40	Library, quiet urban nighttime
30	Bedroom at night
20	Quiet rural nighttime
0	Threshold of hearing

The MPCA has the authority to adopt noise standards pursuant to Minnesota Statute Section 116.07, Subd. 2. The adopted standards are set forth in Minnesota Rule Chapter 7030. The MPCA standards require A-weighted noise measurements. Different standards are specified for daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) hours. The noise standards specify the maximum allowable noise volumes that may not be exceeded for more than 10 percent of any hour (L10) and 50 percent of any hour (L50). Household units, including farmhouses, are included in Noise Area Classification (NAC) 1 with an L10 of 55 dBA and L50 of 50 dBA. **Table 10** shows the MPCA state noise standards in NACs 1-3.

Table 10: MPCA State Noise Standards - Hourly A-Weighted Decibels

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

Source: Minn. R. § 7030.0040

Impacts and Mitigative Measures

The Project will create some intermittent noise during construction (during a limit construction timeframe) and operation of the planned facilities, each of which is discussed below. One farmstead is located within the Project Area; 8 other farmsteads, several rural residences and the Albert Lea/Austin KOA Campground are located in the vicinity of the Project Area (**Figures 6 & 7**). To assess potential noise impacts from operation of the Project, Hayward Solar conducted noise modeling of the Project Substation transformer and inverter step-up transformers (discussed below; see also **Appendix G**).

The amount of noise will vary based on what type of construction is occurring at the Hayward Solar Project on a given day. These noise impacts will be temporary. During construction, noise will be emitted by Project construction vehicles and equipment. Project construction noise will be similar to noise emitted from current farming operations (e.g., tractors plowing, planting or harvesting crops, tractor trailers moving grain, grain handling and storage, and other related farming operations) and nearby road traffic from vehicles. The amount of noise will vary based on what type of construction is occurring at the Project on a given day and time of the day. These noise impacts will be temporary.

Construction associated noise will likely be perceptible at the few adjacent residences (see **Section 4.2.2** and **Figures 2-4 & 7**). Hayward Solar will ensure that construction vehicles and equipment are equipped with properly functioning mufflers and associated noise-control devices and required contractors to maintain these devices.

Grading equipment, bobcats, and other construction equipment are anticipated to emit noise between 76-85 dBA at 50 feet (U.S. Department of Transportation [USDOT], 2017). Noise associated with these types of equipment will primarily occur during the initial site preparation with grading and access road construction expected to last approximately 8-12 weeks. Hayward Solar anticipates pile driving for installation of piers for the rack supports (foundations of the solar panels) will create the most noise measured at 101 dBA at 50 feet (USDOT, 2017). Installation of each rack support takes between 30 seconds to 2 minutes depending on the soil conditions; Hayward Solar anticipates this activity will take up to 3-5 months (depending on construction crew size) across the Project site.

Finally, installation of the solar panels on the tracking system would emit noise levels similar to general construction equipment described above. Typically, a forklift is used to place individual panels on the tracking rack system. The noise from any of these construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. Note that construction activities will be sequenced; site preparation may occur at a portion of the Project site while pile driving occurs at a different location at the same time. As stated above, these noise impacts will be temporary and limited to daytime hours.

The main source of noise from the Project during operation will be from the inverters (which includes the air conditioners housed in each) and to a lesser extent from the step-up transformers and rotation of the tracking systems. To account for ambient noise in the Project Area in the model, a typical daytime ambient noise level of approximately 40.0 dBA was conservatively used as an industry standard and factored into the analysis (see **Appendix G**). Results of noise modeling indicate that the Project will not cause or contribute to an exceedance of Minnesota's noise standards during operation of the Project (**Figure 7**; see also **Appendix G**). **Table 11** summarizes the anticipated distance to reach the most stringent MPCA noise

standard (50 dBA) and lower from the inverters/trackers and the Project Substation 34.5 to 161 kV power transformer modeled for use at the Hayward Solar Project.

Table 11: Noise Model Results for the Project

Decibel Levels	Inverter Distance to dB(A) Levels (feet)	Project Substation Transformer Distance to dB(A) Levels (feet)
50	66	56
45	129	97
40	250	173
35	450	304

Hayward plans to use Sungrow, or equivalent, inverters. These inverters produce 67 dBA at their source. Because the inverters are located within the solar arrays, the noise levels from the Project equipment are not expected to be discernible from background noise levels at homes in the vicinity. Sungrow indicates that its inverters will produce a maximum noise level of 79 dBA at 1 meter. As indicated in **Table 11** above, the distance the noise level would decrease to 50 dBA is 66 feet (for the inverters) and 56 feet (for the transformer); no noise impacts are anticipated. Accordingly, the Project will not cause or contribute to an exceedance of Minnesota's noise standards. The distance of the nearest inverter to a residence is approximately 1,050 feet, which is the farmstead residence located within the southern end of the Project Area and whose landowner is participating in the Project (**Figure 7**). Based upon the noise model results included in **Table 11**, no impacts to this residence are anticipated.

Under certain weather conditions (e.g., rain, fog, high humidity, snow and hoar frost) HVTLs can experience electrical discharges on the conductors that result in a broadband crackling noise or a low humming tone at twice the frequency of the transmission frequency. The noise levels from operation of the short length of the Project 161 kV Gen-Tie Line are not expected to be discernible from operation of the existing SMMPA Hayward-Murphy Creek 161 kV HVTL and other overhead electric distribution lines and background noise levels at residences in the vicinity. Given another SMMPA's Hayward-Murphy Creek 161 kVHVTL exists within the planned Project Gen-Tie Line vicinity, it is not expected that noise from the proposed Project Gen-Tie Line or the Project facilities would significantly alter existing noise conditions. Additionally, all electrical equipment will be designed to National Electrical Manufacturer Association Standards.

In summary, during construction Hayward Solar will mitigate potential noise impacts by limiting construction to daylight hours and use of construction equipment and vehicles with properly functioning mufflers and noise-control devices. No noise impacts are anticipated during Project operation; therefore, no mitigation measures are proposed. Hayward Solar will confirm during final Project design that MPCA noise limits will be met.

4.2.4 Radio and Television Interference

There is one set of radio and television towers (KAAL TV & KAUS FM) located within one mile of the Project Area boundary to the southeast. Corona from transmission line conductors can generate electromagnetic interference at the same frequencies that radio and television signals are transmitted.

Impacts and Mitigative Measures

Neither the Project Gen-Tie Line connecting the Project Substation to the new SMMPA Switchyard or the SMMPA Line Tap connecting the new SMMPA Switchyard to the existing SMMPA 161 kV line are anticipated to cause an adverse impact to radio or television transmission due to their relatively short lengths and because the location where these would be installed is mainly agricultural fields and not near rural residences, farmsteads or other businesses.

Loose hardware on a transmission line can increase this interference. Frequency interference can disrupt the reception of these signals depending on the frequency and strength of the radio and television signal. AM radio frequency interference typically occurs under a transmission line and dissipates within the road right-of-way to either side. FM radio receivers usually do not suffer from interference from transmission lines. Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz); and the interference rejection properties in FM radio systems make them limit amplitude disturbances. Television interference is unusual but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. Due to the short lengths of planned new 161 kV transmission line and their planned location, as well as regularly scheduled maintenance that would be conducted by Project personnel, interference to reception from loose hardware is not expected for the Project.

Impacts to radio and television reception from the Project to nearby receptors are not expected; therefore, no mitigation measures are proposed. If radio or television interference occurs due to the Project, the Hayward Solar will work with the affected landowner/business to restore reception to pre-Project quality.

4.2.5 Aesthetics

The Project Area is located in a rural, flat, agricultural setting (**Figures 1, 2 & 5**). The topography of the Project Area is generally flat with elevations ranging from 1232 to 1265 feet above sea level. Farmsteads in the area (often containing a farmhouse with barns, machine sheds and grain storage) are sprinkled across the landscape approximately ¼ to one mile apart. Most farms have planted windbreaks consisting of trees and shrubs around them. Untilled lines of trees and shrubs can be seen along fence rows.

Paved and gravel roads form grids around farm fields separated by 1/2 to one mile with I-90 along the north edge of the Project. Few remaining surface water features exist as the area now has numerous drain tiles and ditches to remove water from agricultural fields. As discussed in Section 4.1, land use within the Project Area is predominantly agricultural. Corn and soybeans are the most common agricultural crops grown. Cattle and hogs are also raised in the area.

The POI for the Project will be a new SMMPA Switchyard to be located within the northwest portion of the Project Area (**Figure 4**). A short 161 kV Project Gen-Tie Line will extend between the Project Substation and new SMMPA Switchyard; as part of SMMPAs construction of the new SMMPA Switchyard, an in/out 161 kV SMMPA Transmission Line will be installed by SMMPA between the new SMMPA Switchyard and the existing SMMPA 161 kV Hayward-Murphy Creek HVTL (**Figure 3**).

There is one farmstead within the Project Area along 840th Avenue; there are 11 residences on parcels and two observation points within the Albert Lea/Austin KOA Campground adjacent to

the Project Area (see **Figure 5**). **Table 12** provides distances to the nearest residences to the Project (and shown in **Figure 5**), including approximate distance to the Preliminary Development Area boundary and approximate distance to the edge of solar arrays based upon the current preliminary design.

Table 12: Proximity of Residences to the Project

Residence/Receptor Site	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) [1]
1	2,399	2,898
2	756	872
3	710	812
4	758	823
5	779	832
6	1,726	1,804
7	722	792
8	2,602	2,954
9	724	783
10	1,041	1,374
11	2,197	2,461
12 Albert Lea/Austin KOA Campground - Pool	741	781
13 Albert Lea/Austin KOA Campground - Campsite	704	744

[1] Based on current Project preliminary design.

Residence 1 is located adjacent to the northwest portion of the Project Area west of 830th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence, including east side adjacent to the Project.

Residences 2-5 are located within 250 feet of each other adjacent to the west portion of the Project Area. Residence 2 has existing vegetative screening along the south and buildings to the east and north sides. Residence 3 is located south of Residence 2. It has existing vegetative screening along the north, south and east sides. Residence 4 is located west of Residence 3. It has existing vegetative screening along the north and east side. Residence 5 is located west of Residence 4. It has existing vegetative screening along the south, north and east sides.

Residence 6 is located adjacent to the southwest portion of the Project Area southwest of the intersection of 190th and 840th Avenues. This residence has existing buildings and vegetative screening around three sides of the residence, including north and west and south.

Residence 7 is located 2,100 feet north of Residence 6 and northwest of the intersection of 190th and 840th Avenues. This residence has existing buildings and vegetative screening around four sides of the residence.

Residence 8 is located southeast of the intersection of CR 30 and 190th Street along the southeast portion of the Project Area. This residence has existing buildings on the north and west and vegetative screening around four sides of the residence.

Residence 9 is located southwest of the intersection of CR 30 and 200th Street along the east portion of the Project Area. This residence has existing buildings on the south and west and vegetative screening around west and north sides of the residence.

Residence 10 is located west-northwest of the intersection of CR 30 and 200th Street along the east portion of the Project Area. This residence has existing buildings on the north and vegetative screening primarily around west and north sides of the residence.

Residence 11 is located north of the intersection of CR 46 and I-90 along the north portion of the Project Area. This residence has existing buildings on the south and vegetative screening primarily around north and southwest sides of the residence.

Viewpoint 12 is at the swimming pool and viewpoint 13 is at the camping area in the Albert Lea/Austin KOA Campground located north of I-90 along the northeast portion of the Project Area, which is south of I-90. These features have sparse plantings of trees and shrubs to the south between the campground and the interstate and proposed Project. Five additional trees are within I-90's south right-of-way.

Impacts and Mitigative Measures

The Project will convert predominately agricultural land (see **Table 15** in Section 4.2.11.2 and associated discussion) to a solar facility and will alter the current viewshed. Rows of solar PV panels separated by perennial vegetated will be constructed over most of the Preliminary Development Area (**Figure 4** and **Appendix B**). Solar PV use dark anti-reflective glass panels that are designed to absorb sunlight to produce electricity. The images in Section 3.0 provide a reference for how the Hayward Solar Project will appear during operation. PV panels commonly used for this type of project absorb up to 98 percent of the incoming sunlight depending on the angle of the sun, glass texture and use of anti-reflective coatings. Therefore, during operation of the facility there will be little glare from the panels used for the Project.

Solar arrays will occupy most of the disturbed area of the Project (**Figure 4** and **Appendix B**). Electrical transformers and inverters, a Project Substation, a POI/new SMMPA Switchyard, an O&M building, and access roads will utilize the rest of the disturbed area. Most of the facility, including the solar arrays, will be low-profile, typically less than 12 feet tall. While the Project will create additional aesthetics compared to current predominately agricultural land use, the Project facilities (Project Substation, O&M building, SMMPA Switchyard, new overhead electric lines, etc.) will be similar to existing facilities associated with farming and utilities serving the area. Since the Project Area and vicinity are generally flat and due to existing trees along agricultural fields and vegetative cover along windbreak, the visual impact of the Project is expected to be limited to surrounding land and higher elevation points (e.g., the I-90 overpass located on the north end of the Project). The feedback that Hayward Solar has gathered so far from public outreach efforts completed for the Project to date has not indicated aesthetic or visual concerns associated with the Project from the surrounding landowners or community. As stated above and in Section 5 below, the Project has garnered strong positive landowner involvement and support, as well as overall wide community support.

The Project Substation and new SMMPA Switchyard will contain transmission pole A-frame deadend structures that will support above ground conductors. The deadend structures will be 90-100 feet in height. These transmission facilities will be grouped together and connect to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL that crosses through the northern portion of the Project Area approximately 750-900 feet north of the planned new SMMPA

Switchyard site and span over CR 46. They will be visible from the local roadways and about 1,200 feet from the nearest residence (Residences 1-5 and 11; see **Figures 3 & 4** and **Appendix B**). From outside the facility these structures would be most visible from I-90 and CR 46. Other power poles with heights up to 100 feet are located in the vicinity of the Project and adjacent to roadways and the rail line. The addition of Project transmission facilities is not expected to significantly alter the viewshed or increase visual impacts.

The Project solar arrays (surrounded by security fence) will be visible from adjacent roadways and parcels up to approximately 1/2 mile given their relative low profile and color. Project fencing will look similar to existing agricultural field fencing. While relatively few trees exist within the Project Area, Hayward Solar has designed the Project to avoid tree clearing which will somewhat break up the view of the arrays in some areas.

Exterior security lighting will be installed at the O&M building and Project Substation; as needed by maintenance personnel, lights will be used if work or maintenance is required after dark. A motion sensing, down casting security light will be installed at the locked entrance of the Project. Switch activated lights will be placed at each inverter for repair purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operation of the Project.

4.2.6 Socioeconomics/Environmental Justice

The Project is in a rural area within Hayward Township and no incorporated communities are located within the Project Area. The incorporated communities that are geographically closest to the Project Area are Hayward (1.6 miles west), Albert Lea (6.5 miles west), and Austin (8 miles east). Albert Lea is also the nearest larger city to the Project Area. Data is provided at the Township, County, and State levels for the purpose of comparing the demographics in the Project Area to a larger area. There is no indication that any minority or low-income population is concentrated within the Project Area or that the PV solar panels will be placed in an area occupied by a minority group.

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 (EPA, 2021). Minority and/or low-income communities are often concentrated in small geographical areas within the larger geographically and/or economically defined population. Minority communities and low-income communities may constitute a very small percentage of the total population and/or geographical area.

This discussion does not address every socioeconomic 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.

4.2.6.1.1 Population and Race

Population and race characteristics for Hayward Township, Freeborn County, and Minnesota State are detailed in **Table 13**. The township has a very small population compared to the County. The population of Freeborn County according to the 2010 Census was 31,255 with a median age

of 44.2 years. Hayward Township had a population of 250 and a median age of 44.5 years. While the size of Hayward Township is an incredibly small percentage of Freeborn County as a whole, the median ages are almost identical.

The predominant race in Hayward Township and Freeborn County is White (alone, not Hispanic or Latino). Less than 10 percent of the population is categorized as a minority population. The largest minority population in Freeborn County 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 13: Population and Race Characteristics in Minnesota

Category [1]	Hayward Township	Freeborn County	Minnesota
Total Population	250	31,255	5,303,925
Median Age	44.5	44.2	37.4
Race and Hispanic or Latino Origin			
One Race (%)	100	98.3	97.6
White (%)	98.0	93.2	85.3
Black or African American (%)	0.0	0.7	5.2
American Indian or Alaska Native (%)	0.0	0.2	1.1
Asian (%)	1.6	0.8	4.0
Native Hawaiian/Pacific Islander (%)	0.0	0.1	0.0
Some Other Race (%)	0.4	3.4	1.9
Two or More Races (%)	0.0	1.7	2.4
Hispanic or Latino Origin (of any race) (%)	2.0	8.8	4.7
White Alone, not Hispanic or Latino (%)	94.4	89.4	83.1
Population Density (per square mile)	7.02	44.2	66.6

1 Data retrieved from the 2010 Census.

4.2.6.1.2 Housing

Freeborn County had 14,231 total households in 2010 with 1,054 vacant housing units. While Hayward Township had 114 occupied housing units and 9 vacant. The housing characteristics are detailed in **Table 14**.

Table 14: Housing Characteristics

Category [1]	Hayward Township	Freeborn County	Minnesota
Total Households	123	14,231	2,347,201
Average Household Size	2.19	2.32	2.48
Total Housing Units			
Occupied	114	13,117	2,091,548
Vacant	9	1,054	256,694

1 Data retrieved from the 2010 Census.

In the nearest metropolitan area, Austin, Minnesota, there are approximately 527 vacant housing units (U.S. Census Bureau, 2010). In addition, according to the City of Austin's website (austinmn.com) numerous hotels, guest houses, and campgrounds are available in the greater

Austin area. These residences and temporary housing statistics suggest the local area would support an influx of construction workers if needed.

4.2.6.1.3 Income and Poverty

As shown in **Table 15**, the per capita income for Freeborn County was $23,645 in 2010. Hayward Township had a slightly lower estimated per capita income of $19,750. Hayward Township has a higher unemployment rate than Freeborn County as a whole, but a percentage of individuals living below poverty level.

The primary industries in Freeborn County are classified as Manufacturing (21 percent), Health Care and Social Assistance (17 percent), and Retail Trade (12 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, Hayward Township has a lower estimated per capita income, a higher unemployment rate, and lower number of persons living below the poverty level than Freeborn County.

Table 15: Income and Poverty

Category [1]	Hayward Township	Freeborn County	Minnesota
Per Capita Income	19,750	23,645	28,563
Unemployment Rate (population over 16 years) (%)	12.8	2.7	5.9
Persons Living Below Poverty Level (%)	5.0	11	11.6

[1] Data retrieved from the 2010 census.

Hayward Solar evaluated the Minnesota Areas of Environmental Justice Concern interactive map created by the Minnesota Pollution Control Agency (MPCA, 2021) 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.

The Project is not within an MPCA-identified area of concern for Environmental Justice. In Hayward Township (census tract 1810), about 22 percent of residents reported income less than 185 percent of the poverty level. The only area within Freeborn County that meets the area of concern for environmental justice is the Town of Albert Lea, about 7 miles southeast of the Project. No portion of the Project Area includes over 50 percent people of color.

Impacts and Mitigative Measures

No measures to mitigate socioeconomic or environmental justice impacts are needed because the Project is anticipated to achieve a positive socioeconomic benefit. Owners of land where the Project will be constructed have entered into lease or purchase contracts with the Applicant and are compensated for the use of the land based upon these agreements. Of the seven participating landowners involved with the Project, six currently farm their own respective land (one of the participating landowners farms another participating landowner land); as such, no tenant farmers outside of the participating landowner group actively work the Project Area land.

The Project is designed to be socioeconomically beneficial to the landowners and those who reside near the Project Area, local governments, and communities. Landowner compensation is established by voluntary option leases or purchase agreements between the landowners and Hayward Solar for lease or purchase of the land for the Project. The development of solar energy in this part of Minnesota has been important in diversifying, supporting, and strengthening the personal income tax base of southeastern Minnesota. As no areas of concern for environmental justice were found within the Project Area, this Project would diversity and support the personal income tax base of the area with no negative impact to minority groups or other groups/areas of concern. Additionally, there are no tenant farmers at risk of losing farmland.

Hayward Solar conducted a land use study concerning the Project; a copy of the *Land Use Analysis of the Hayward Solar Project* (dated January 2021) is included in **Appendix H**. The land use study concludes that, when using a real-options analysis, the land use value of solar leasing far exceeds the value for agricultural use when considering the development of the Project. The Project will cover approximately 1,272 acres, roughly 0.3 percent of the farmland in Freeborn County. The analysis indicates the price of corn would need to rise to $12.72 per bushel, or yields for corn would need to rise to 410.2 bushels per acre, by the year 2052 for corn farming to generate more income for the landowner and local community than the solar lease. Alternatively, the price of soybeans would need to rise to $40.66 per bushel or yields for soybeans would need to rise to 137.8 bushels per acre, by the year 2052 for soybean farming to generate more income for the landowner and local community than the solar lease. At the time the land use report was prepared average corn and soybean prices were $3.26 and $8.29 per bushel, respectively, and average yields were 186.7 and 49.9 bushels per acre, respectively.

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 Freeborn County or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states. 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. Hayward Solar will issue an RFP to contractors to construct the Project. Hayward Solar 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 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. The operations and maintenance of

the facility will require approximately four long-term personnel. The Project anticipates that sufficient temporary lodging and permanent housing will be available within Freeborn County, and within the Albert Lea and Austin areas, to accommodate construction laborers and long-term personnel.

The Hayward Solar Project is expected to produce beneficial socioeconomic effects to the area. Wages will be paid, and expenditures will be made to local businesses and landowners during the Project's construction and operation. Lease options and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project is expected to generate annual property tax revenue of $305,000 for Freeborn County and approximately $76,000 for Hayward Township. It is also expected to support 204 jobs during the construction and installation phases, and four permanent jobs during the 35-year operational life of the Project. The Project will also contribute to the local economy through land lease payments to participating landowners and direct/indirect purchases of goods and services.

Temporary construction jobs within Freeborn 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, Hayward Solar will annually generate $2.5 million in economic output by supporting approximately 25 indirect jobs and distributing nearly $1.5 million in direct earnings. 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. The socioeconomic impacts associated with the Project will be positive; therefore, no mitigation measures are proposed.

4.2.7 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 (2010), the population of Freeborn County derives from a mostly European heritage accounting for approximately 89% of the population, followed by 8% Hispanic, and 3% African American, Native American and Asian American. The majority of the population in Freeborn County identifies as Caucasian with an ethnic background of European origin. The region surrounding the Project has cultural values tied to the area's Norwegian, German, and Native American heritage, and the agricultural economy. 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.

Cultural representation in community events appears to be more closely tied to art, food, seasonal events, national holidays, and municipal events than to those based in ethnic heritage. Examples of regional cultural events include summertime festivals such as the Freeborn County Fair (freeborncountyfair.com, 2020).

Construction of the proposed Project is not expected to conflict with the cultural values and heritage of the area.

Impacts and Mitigative Measures

Construction and operation of the Project would not impact public participation in the regional community cultural events noted above, as the Project Area is located outside of municipal areas. Therefore, no impacts to cultural values are anticipated and no mitigation measures are proposed.

4.2.8 Recreation

Recreational opportunities in Freeborn County primarily include snowmobiling, swimming, hiking, camping, bicycling, nature walking, picnicking, and fishing, and opportunities to explore museums, parks, nature centers, and Albert Lea Lake (**Figure 8**).

Information from the MNDNR, Freeborn County and other federal Geographic Information System (GIS) databases were reviewed to identify recreational resources within and near the Project. With the exception of a Freeborn County Trail 133 (a snowmobile trail – see **Figure 8**), there are no designated public (federal, state, or local) recreational lands within the Project Area boundaries. Trail 133 crosses through the center of the Project Area and northern border. A setback buffer was created so that the Project design avoids this crossing trail (**Figures 3 & 4**) and no Project facilities interact with Trail 133.

According to the MNDNR Recreational Compass, there are no state forests, national forests, or national wildlife refuges within close proximity to the Project boundaries. Additionally, there are no state-owned Off-Highway Vehicle (OHV) trails and no MNDNR SNAs identified within a mile of the Project boundaries (MNDNR 2014). Also, no lakes with public access are located in the Solar Project boundary.

Primary recreational resources identified within roughly 5 miles of the Project Area boundary area shown in **Table 16** and **Figure 8**.

Table 16: Recreational Resources

Resource	Approximate Distance to Project Area Boundary
Freeborn County Trails (Snowmobile Trail 133)	Crosses through Project Area
Albert Lea/Austin KOA Campground	0.10 mile
Blazing Star State Trail	1.8 miles
Albert Lea Lake	3.3 miles
Myre-Big Island State Park	3.6 miles
Juglans Woods AMA	4.4 miles

The nearest public recreational resource to the Project is the Freeborn County Snowmobile Trail 133, followed by the Albert Lea/Austin KOA Campground, a campground located on the other side of I-90, across the northern edge of the Project. The campground provides lodging, RV sites, tent sites, and a pool. Additionally, a portion of nearby nature trail, Blazing Star State Trail, is located about 1.8 miles from the western edge of the Project Area boundary.

The nearest MNDNR Aquatic Management Area (AMA) is the Juglans Woods AMA, located over four miles southwest of the Project Area and the nearest state park is the Myre-Big Island State Park, located over three miles west of the Project Area in Albert Lea. Similarly, there are no County or city parks within one mile of the Project Area.

Impacts and Mitigative Measures

The Project will avoid the Freeborn County Snowmobile Trail 133; however, during construction

it may be necessary to temporarily cross through the trail area from time to time. Hayward Solar will mainly construct the Project during non-winter months thereby avoiding impacts to use of Trail 133 by snowmobilers. If construction activities are required during winter months when Trail 133 is in use, Hayward Solar and its contractors will coordinate with operators of Trail 133 to ensure impacts are minimized and construction activities are safely performed in the vicinity of Trail 133.

Except for potential minimal impacts to Trail 133, no other significant impacts to recreational opportunities are anticipated and, therefore, no other mitigative measures are proposed.

4.2.9 Public Services and Infrastructure

4.2.9.1 Public Services and Utilities

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, potable water, sanitary systems, and utilities. Freeborn County provides Police services to the area where the Project is proposed; the Hayward Volunteer Fire Department provides fire protection and first responder medical services to the Project Area (Hayward 2021). The Project is sited between Albert Lea and Austin Medical Centers.

The Project is located in an area where private wells and septic systems are used at rural and farmstead residences. Review of the MDH County Well Index identified two active irrigation wells within the Project boundary (see also Section 4.5.2). A sealed well was identified near the proposed access roads off County Road 46 (**Figure 9**).

There are numerous telephone services and broadband providers in Freeborn County (MDEED 2020).

Two high voltage transmission lines cross the Project Area; one is the SMMPA Hayward-Murphy Creek 161 kV HVTL located in the northern portion of the Project and the other is the ITC Midwest LLC 161 kV HVTL located in the southern portion of the Project. Approximate locations of these transmission lines are displayed on **Figure 6**. According to the National Pipeline Mapping System, a Pembina Cochin crude oil pipeline and Alliance Pipeline natural gas pipeline pass through the northern portion of the Project Area as displayed on **Figure 6** (NPMS 2021).

No AM, FM, microwave, television, or other radio towers were identified in the Project Area according to publicly available FCC sources. One microwave tower was identified within one mile of the Project boundary.

Impacts and Mitigative Measures

Hayward Solar 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. Hayward Solar 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 utilities; if conflicts are unavoidable Hayward Solar 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 Project will interconnect into the existing Hayward-Murphy Creek 161 kV HVTL. During interconnection construction work associated with the new SMMPA Switchyard, customers may experience short outages when the Hayward-Murphy Creek 161 kV HVTL 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 are anticipated to be of short duration and closely coordinated with utilities and landowners.

Both gas pipelines that cross the Project Area have been avoided by Project facilities with the exception of proposed electrical collection lines. Encroachment agreements will be executed and utility locations will be marked prior to construction to avoid impacts from construction and operation activities. The encroachment agreements will specify coordination and construction methods required for the crossing and actions to take to complete the crossing in a safe, secure and agreed-to manner. Often the depth of the pipeline requires that the collection line be bored underneath the pipeline to maintain the 36" minimum clearance (additional clearance may be required in the encroachment agreement depending on the specific pipeline). The pipeline company will mark the line location prior to construction (e.g., via 811 call), and often will expose the pipeline ("pothole") to confirm the exact location and depth prior to the boring. In accordance with applicable encroachment agreement requirements, collection lines will cross the pipeline ROW's as close to a 90-degree angle as possible using a minimum clearance of 36 inches between Project collection lines and existing pipelines in all directions. High-density polyethylene conduit or other shielding will be used to protect the collection lines.

4.2.9.2 Roadways

Access to the Project will be via existing County and Township roads as shown on **Figures 2-4**. The major roadway in the area is I-90 located immediately north of the proposed Project. Other roads that surround the Project Area are local County or Township roads. The Project Area is bordered by County Road 46 in the northern portion and bound by County Road 30 to the east. Annual Average Daily Traffic (AADT) counts based on Minnesota Department of Transportation's (MnDOT's) 2017 Publication of traffic volumes for Freeborn County are provided in **Table 17** and displayed on **Figure 6** (MnDOT, 2017).

Table 17: Annual Average Daily Traffic in the Project Vicinity

Roadway	Year	AADT Traffic Volume Total
I-90 (north of Project Area to Hayward, MN)	2017	11,900-12,000
County Road 46 (crosses Project Area to Hayward, MN)	2017	1,950
County Road 30 (850th Ave eastern boundary of Project Area)	2017	470

Source: MnDOT, 2017

There will be several access points to the Project. The northern portion of the Project will be accessed from County Road 46 (East Main Street), 200th Street (T-121) and T-236. The southern portion of the Project will be accessed from County Road 30 (850th Avenue), 200th Street, and T-236. Access from I-90 is not currently being contemplated for the Project.

Impacts and Mitigative Measures

Access to the Project will be via existing Township and County 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 Project are shown on **Figures 2-4 & 6** (see also **Appendix B**). Hayward Solar is working with Freeborn County staff on a road use agreement to address road use and related concerns. This agreement will be completed prior to start of construction.

During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of Project facilities, primarily through additional construction worker traffic, equipment and material deliveries and potentially slow-moving construction vehicles. Hayward Solar will secure necessary local permits for road access and other ancillary aspects of the Project.

Overall construction traffic will use the existing State and County roadway system to access the Project site and facilities to deliver construction materials and personnel. Traffic during construction is estimated to average 150-200 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction.

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 seasons. However, these delays should be minimal for the relatively short construction delivery period. Overweight or oversized loads are unlikely given the type of construction and materials required for the Project. If they are required, Hayward Solar will obtain the appropriate approvals prior to construction.

After construction is complete, traffic impacts during the operational phase of the Project are expected to 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; traffic function in the Project Area will not be impacted as a result.

4.2.9.3 Other Transportation Infrastructure

One railway crosses the northwestern portion of Project Area (**Figures 1 & 6**). SMMPA will construct its 161 kV SMMPA Line Tap from the SMMPA Switchyard across the railway to SMMPA's existing 161 kV transmission line. SMMPA will be responsible for securing any necessary encroachment agreements with the railway owner prior to construction to minimize impacts to rail traffic.

According to the Federal Aviation Administration (FAA), there are no FAA-registered airports located within three nautical miles of the Project Area.

Impacts and Mitigative Measures

One railroad is located in the Project Area (**Figure 6**). SMMPA will be responsible for securing any necessary encroachment agreements with the railway owner prior to construction to

minimize impacts to rail traffic installing and operating the planned 161 kV SMMPA Line Tap connecting the SMMPA Switchyard to the existing SMMPA line (**Figure 4** and **Appendix B**). The agreement and easement will include provisions that will avoid impacts to railway operations during construction and operation of the Project.

There are no FAA-registered airports in the Project vicinity that will be affected by the Project; therefore, no mitigation is needed or planned concerning airports.

4.2.10Land Use and Zoning

4.2.10.1 Zoning

Based on Freeborn County zoning information, the Project Area is zoned agricultural. Review of the County Beacon GIS Viewer (see Beacon - Freeborn County, MN - Map (schneidercorp.com)) indicates Project land parcels are classified as agricultural or actively farming agricultural properties. Land parcels are shown as agricultural on the 1990 Land Use Map, although zoning is not indicated on this map. The County's Zoning Ordinance outlines standards for "large solar farms and solar facilities" (Freeborn County, 2017).

Hayward Solar is coordinating with County and Township local officials regarding the Project (see Section 5.0 below). As noted in Section 26-71 of the Freeborn County Renewable Energy Ordinance, development of large solar energy systems within the agricultural district is a conditionally permitted use (Freeborn County, 2017). The Freeborn 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 Power Plant Siting Act (Minnesota Statutes 216E). Minnesota Statutes §216E.10, Subd. 1 states that the SP is the only site approval required for construction of the proposed Project. A SP supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances put in place by regional, county, local and special purpose governments. Regardless, Hayward Solar has applied County standards to the Project where feasible.

The proposed Project will consider the setback requirements noted in the Renewable Energy Ordinance where practicable and as discussed in Section 3.2.1.

4.2.10.2 Land Use

The Project is located within a rural landscape, and therefore the primary land use in the Project Area is agricultural (96.6%; U.S. Geological Survey [USGS], 2011); see **Table 18** and **Figure 10**. The remainder of the Project Area consists of developed land (3.2%) and a small amount of herbaceous or hay/pasture land (0.1%). The remaining identified land use is a minor area (less than 0.1%) of mixed forest.

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 CR 46, CR 30, CR 102, 200th Street, and T-236 (Figure 6). The small area (2.6 acre) of herbaceous lands within the Project Area is associated with roadside ditches. The small amount of mixed forest surrounds the rural residence located in the southwestern portion of the Project Area.

Table 18: Land Use Within the Project Area

Land Use Type	Acres in Project Area	Percent of Total Acreage
Cultivated Crops	1,892.61	96.64%
Developed, Low Intensity	16.93	0.86%
Developed, Medium Intensity	2.38	0.12%
Developed, Open Space	43.75	2.23%
Hay/Pasture	0.31	0.02%
Herbaceous	2.27	0.12%
Mixed Forest	0.13	0.01%
Total	**1,958.4**	**100.0%**

Farmsteads are sparsely scattered outside of the Project Area generally situated near public roads. One farmstead is located in the Project Area; however, proposed Project facilities have been sited around the residence and setbacks implemented. Based on review of available aerial photography, there are seven residences located on parcels adjacent to the Project Area as highlighted on **Figures 1, 2 & 10**.

Hayward Solar reviewed Freeborn County's *Land Use Policy Plan* (1982) during preparation of the Project design. As feasible, the Project has been designed in compliance with the goals and policies of the *Land Use Policy Plan*. The *Land Use Policy Plan* acts as a basis for the Freeborn County Zoning Ordinance and as a guideline to be used to make adjustments to the land use system of the County. Policies of the Agricultural District are to preserve and conserve protect agricultural areas for agricultural purposes. *The Land Use Policy Plan* states that non-farm uses should not be allowed to locate on agricultural land unless a need for the use is demonstrated and other suitable locations are not available.

Hayward Solar has demonstrated a need for the use of a solar energy facility in this location in the CN Application and throughout this Site Permit Application being submitted to the Commission for approval. Hayward Solar has demonstrated the lack of other suitable locations (see Section 2.3). Since Project land will be temporarily leased from participating landowners and land will be returned to agricultural land uses upon decommissioning of the Project, the Project will further the County's goals of providing long-term agricultural opportunities.

Impacts and Mitigation

The Project will temporarily change the land use from agricultural to solar energy generation use within the Preliminary Development Area (**Figures 2-4**). The temporary conversion of agricultural land to the solar facility will have a relatively minimal impact on the rural character of the surrounding area or Freeborn County. As discussed further in Section 4.3, Land-based Economies, of the 462,416 acres in Freeborn County the majority is classified as agricultural land. Impacts to 1,272 or less acres of agricultural land within the planned Project facility would reduce the amount of agricultural land in the County by less than 1%. Expected land use impacts within the Preliminary Development Area are provided in **Table 19**.

Table 19: Expected Land Use Impacts – Preliminary Development Area

Land Use Type	Acres in Preliminary Development Area	Percent of Total Acreage
Agricultural	1,265.7	99.48%
Developed	5.8	0.45%
Herbaceous/Hay/Pasture	0.8	0.06%
All other land uses	0	0%
Total	**1,272.3**	**100.0%**

Even though Hayward Solar proposes impacting a relatively small percentage of available farmland in Freeborn County with the Project, Hayward Solar has coordinated with DOC-EERA, MDA, and other applicable stakeholders concerning the Project AIMP (**Appendix D**) and VMP (**Appendix E**), as discussed below. The 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 VMP was developed to address revegetation of the Project site in accordance with DOC-EERA draft guidelines and other applicable agency concerns. Hayward Solar met with MDA staff on December 10, 2020 to discuss the AIMP and VMP plan contents and site-specific characteristics. MDA reviewed and approved the AIMP and VMP for the Project (see Section 5.0 and **Appendix A** for agency correspondence).

Normal agricultural activities can continue within some portions of the Project Area not converted to solar modules, access roads, O&M building, transmission facilities, and fencing. After the useful life of the Project, the current agricultural land use would be restored by removing the solar facility. Hayward Solar prepared a Decommissioning Plan which will be implemented upon completion of the Project (see Section 3.4 and **Appendix F**).

The Project is not anticipated to preclude current or planned land use on adjacent parcels. Upon decommissioning and removal of the Project, the affected parcels may be returned to the existing agricultural use or transitioned to other planned land uses.

The Project has been designed in compliance with the Freeborn County Land Use Policy Plan. Agricultural activities will be resumed upon decommissioning of the Project. Components of the Project may be located in areas where there is a planned extension of water, sewer, or other services. Construction of the Project would not preclude the future orderly extension of these services across property under Hayward Solar's control as these extensions would likely be accomplished by utilizing existing public rights-of-way which will not be impacted by the Project.

As the Project is subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act, the CN and SP to be issued by the MPUC will serve as approval of the Project. Hayward Solar will continue to coordinate with Freeborn County on other potential permits for the Project (e.g., road use agreement, driveway permits, etc.).

Because no permanent land use or zoning impacts are anticipated, no additional mitigation measures are proposed beyond those described above.

4.3 Land-Based Economies

4.3.1 Agriculture

According to the U.S. Department of Agriculture's (USDA's) 2017 Census of Agriculture, of the 462,000 acres that comprise Freeborn County approximately 394,024 acres are cropland. A total of 1,076 individual farms are located in Freeborn County with the average farm size at 366 acres. The top crops (in acres) include corn, soybeans, 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, 2017).

The 2017 market value of agricultural production in Freeborn County was approximately $364 million. Livestock, poultry, and their products accounted for approximately 39 percent of the total value of agricultural production, while crop sales accounted for the remaining 61 percent (USDA, 2017).

Agricultural use encompasses nearly 100% of the land within the Project Area, with corn and soybean crops covering roughly 96% of the total land area according to AcreValue (AcreValue, 2020). The remaining land is mostly made up of other agricultural land.

Impacts and Mitigative Measures

As indicated in **Table 19** above, the Project will temporarily impact approximately 1,266 acres of agricultural land within the Preliminary Development Area (**Figures 2-4** and **Appendix B**) and will not result in a significant impact to land-based economies in the Project vicinity as this acreage constitutes less than 1/2 of 1% of the agricultural land in Freeborn County (462,000 acres). Agricultural production would continue in the surrounding areas during construction and operation of the Project.

Areas disturbed during construction will be repaired and restored to pre-construction contours and characteristics as much as practicable. 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 certain areas within the Project Area but outside the fence of the Preliminary Development Area during construction and operation of the Project. Similarly, if mowing or grazing vegetation management strategies are used, some agricultural activities would continue within the Preliminary Development Area.

Measures to mitigate topsoil removal include limiting removal to areas designated for spot grading and construction of roads and structures. Impacts to soils 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, which will be specifically prepared for the Project, and as provided below. BMPs during construction and operation for general agricultural impact mitigation is outlined in the Project AIMP included in **Appendix D**. Vegetation management during construction and post-construction Project operations will be implemented in accordance with the Project VMP included in **Appendix E**.

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, primarily native 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.

As discussed in the SWPPP, AIMP (**Appendix D**) and VMP (**Appendix E**), the following is an overview of best practices and mitigation planned during construction:

- Hayward Solar will contract with a third-party environmental monitor to periodically observe earthmoving activities during Project construction to ensure appropriate measures are taken to properly segregate and handle the topsoil;
- Topsoil will be separated from the other subgrade/subsoil materials when earthmoving activities, excavation, or trenching are taking place;

- Construction activities will be halted if weather conditions pose a risk to worker safety and/or would cause significant soil compaction or rutting;
- The construction plan will remain flexible and implement new practices/procedures as needed under the directive of adaptive management;
- Stripped topsoil will be stored on site and any topsoil that is respread will be loosely compacted;
- While performing foundation work, stripped topsoil will be stored for later use and once the construction is complete, topsoil piles will be distributed in a thin layer adjacent to the Project Substation and SMMPA Switchyard areas and the topsoil revegetated with an appropriate seed mix;
- Trenching activities will require excavation of topsoil and subgrade materials (which will be segregated) and ultimately backfilled with unscreened native backfill and covered with topsoil;
- Silt fencing on the downside of all hills, near waterways, and near drain tile inlets will all be used to minimize erosion;
- Soil drainage conditions as they currently exist will be preserve as if damage occurs, Hayward Solar will fix it as soon as practicable; and
- Construction-related debris and unused material will be removed by Hayward Solar.

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

As provided in the lease option agreements, payments will be made by Hayward Solar to the owners of the land used for the Project. These payments will replace the revenue which would have been generated if agricultural production were continued by the landowners. In fact, based upon an analysis completed by Strategic Economic Research (see **Appendix H**), the land use value of leasing the land for solar far exceeds the value for agricultural use when considering the development of the land for the Project.[6] For example, the price of corn would need to rise to $12.72 per bushel from current pricing of $3.26 per bushel or yields for corn would need to rise to approximately 410 bushels per acre by the year 2052 from the current approximate yields of 187 bushels per acre to generate more income for the landowner and the local community than the solar lease.

4.3.1.1 Prime Farmland

Soil characteristics within the Project Area were assessed using the Soil Survey Geographic database (SSURGO) (Soil Survey Staff, 2020). The SSURGO database is a digital version of the original county soil surveys developed by NRCS for use with GIS. It provides the most detailed level of soils information for natural resource planning and management. Soil maps are linked in the SSURGO database to information about the component soils and their properties (USDA, NRCS, 2020). **Table 20** lists the USDA/NRCS classified soil types located within the Project Area (**Figures 11 & 12**).

[6] Land Use Analysis of the Hayward Solar Project (January 2021), Strategic Economic Research (**Appendix H**).

Table 20: Prime Farmland Classifications within Preliminary Development Area

Farmland Classification	Area (Acreage)	Percent of Preliminary Development Area
Prime Farmland	58.1	4.6
Prime Farmland if Drained	590.3	46.4
Statewide Importance	623.7	49.0
Not Prime Farmland	0.00	0
TOTAL	**1272.1**	**100**

Slightly more than half of the Preliminary Development Area is located on prime farmland/prime farmland if drained and almost half is located on farmland of statewide importance (discussed below) as shown on **Figure 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). It contains soils that are considered to be nationally significant. 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, 2019).

Approximately 58 acres of prime farmland and 590 acres of prime farmland if drained are located within the Preliminary Development Area (**Figures 2 & 11**). These acreages of prime farmland would be temporarily taken out of production for the life of the Project but would not be permanently removed. Hayward Solar identified and assessed two other potential sites for the Project in an attempt to find a site that would otherwise be compliant with the '*prime farmland exclusion rule'* found in Minnesota Rules 7850.4400, subp. 4 (Rule). Hayward Solar ruled out the two potential sites during its review of possible sites and does not have any leases or purchase options that would allow it to use the optional sites for the Project. Moreover, Hayward Solar does not have condemnation rights and therefore is unable to force any landowner to grant Hayward Solar any lease, easement or purchase option.

Hayward Solar conducted a prime farmland assessment to review the feasibility and prudency of potential sites as well as the prime farmland impacts (see Prime Farmland Assessment in **Appendix C**). The detailed assessment identified no other feasible or prudent sites in comparison to the Project Area (concerning prime farmland impacts) and concluded that the two otherwise Rule compliant sites were not feasible or prudent areas for siting the Project. Accordingly, there are no feasible or prudent alternatives to the proposed Project Area for the Project. The detailed Rule assessment, which was prepared following guidance issued by the DOC EERA in May 2020 as it relates to the Rule,[7] is included in **Appendix C**.

In addition to prime farmland, approximately half (49%) of the Preliminary Development Area is on farmland of statewide importance. These areas are classified as soils that, although they do not have national significance and are not considered prime farmland, are of statewide importance for agriculture. In addition to that distinction, farmland of statewide importance does not carry the same protections as Prime Farmland as discussed above.

[7] *Solar Energy Production and Prime Farmland – Guidance for Evaluating Prudent and Feasible Alternatives* (Minnesota EERA, May 19, 2020). See also https://mn.gov/eera/web/doc/13929/.

Additionally, the Project site was chosen due to the capacity of and proximity to the SMMPA Hayward-Murphy Creek 161 kV transmission line, (thus minimizing the need for extensive new transmission facilities), the presence of one of the largest concentrations of non-prime farmland soils in Freeborn County, willing landowners and community interest in the Project, the lack of farmsteads and rural residences and human settlement impacts, the lack of other environmental constraints, adequate roads for access, flat terrain, and overall need for renewable energy generation.

Impacts and Mitigative Measures

Grading activities with the greatest potential to affect topsoil conditions is likely to be for the grading associated with construction of access roads and the Project Substation. Grading estimates completed for the Preliminary Development Area indicate that roughly 18.9 acres of grading and 2,700 cubic yards of cut and fill for the Project arrays (**Figures 2 & 11**; see also **Appendix B**). Cut and fill volume estimates for the access roads, basins, inverter pads, substation, and SMMPA Switchyard are pending. This represents only about two percent of the Preliminary Development Area that will require grading.

Areas to be graded are shown in **Appendix D** as part of the AIMP. Areas are limited and include approximately 7.3 acres of prime farmland. The majority of soil disturbances will occur during the first phase of Project construction when grading takes place. Soils may need to be moved in some areas to "flatten" parts of the Project site to lessen further disruption and avoid erosion. The earthwork activities will be completed using typical earthmoving construction equipment – scrapers, bulldozers, front-end loaders, excavators and skid-steers. Topsoil will be separated from subsoil/subgrade to maintain the integrity of the productive, topsoil. Once topsoil is respread, appropriate seed mixes will be spread to maintain the soil, avoid erosion, and enhance nutrient cycling.

Topsoil handling will first include stripping topsoil that sits higher than other areas that need to be leveled. Topsoil will be pushed outside of the cut/fill areas and collected into designated spots for later use. This topsoil will be separated from subsoil/subgrade materials. Once topsoil is removed from the cut/fill areas, the sub-grade materials will be removed as required from on-site hills and relocated to on-site low spots. In the limited instances where subsoil and topsoil will both be excavated and held in the same area, a thin straw mulch layer will be used to facilitate effective separation. Prior to relocating subgrade materials to the low spots, top soil in the low areas will be stripped and set aside before the fill is added, then respread over the new fill. The sub-grade materials would be compacted in place. When compaction is complete, the topsoil spoil piles will be re-spread over the reconditioned sub-grade areas. While in piles, topsoil will be windrowed or piled and loosely compacted and/or tracked with stormwater and wind erosion BMPs in place.

Because the Project will result in a temporary land use without significant grading, minimal loss of soils or opportunity for future agricultural production is expected when the Project is decommissioned. In addition to topsoil being separated from subsoil/subgrade, once respread, seed mixes will be spread over the topsoil to avoid erosion, maintain the integrity of the soil, and improve nutrient cycling. BMPs are further discussed in the accompanying Project AIMP and VMP (**Appendices D & E**, respectively).

Impacts to soils will occur during the construction and decommissioning stages of the Project. Because the Project location is on relatively level existing agricultural fields, construction will require minimal grading to provide a level surface for the solar arrays. Impacts to soils would be

temporary and minor and would be mitigated through the proper use and installation of BMPs such as stockpiling topsoil for later spreading and seeding and minimizing soil compaction to work areas to the degree practicable. Hayward Solar will also develop a SWPPP that complies with applicable MPCA rules and guidelines. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.

As indicated above, Hayward Solar has prepared an AIMP and VMP outlining how soils and vegetative cover will be managed during and after construction for preservation of soils and creation of beneficial habitat (**Appendices D & E**, respectively).

4.3.2 Forestry

The Preliminary Development Area is located solely on agricultural land (**Figures 2 & 10**). 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.

Impacts and Mitigative Measures

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

4.3.3 Tourism

This region draws tourists to participate in recreational activities such as festivals, fairs, markets, 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 4.2.8, and local community festivals and other events (**Figure 8**). Examples of local community festivals include summertime events like the Freeborn County Fair (freeborncountyfair.com, 2021).

With the exception of Freeborn County Trail 133 (a snowmobile trail), no recreation resources are located in the Project Area (**Figure 8**), further discussed in Section 4.2.8. The nearest public recreational resource to the Project is Albert Lea/Austin KOA Campground, a campground located north of I-90 on the northern border of the Project Area. Additional resources are a few miles away.

Impacts and Mitigative Measures

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

Freeborn County Trail 133 is used by snowmobilers during the winter. The Project is designed to avoid siting Project facilities within, crossing or near Trail 133 which will allow full use of the trail during winter months once the Project is constructed and operating. During construction temporary use of the Trail 133 area may be necessary for crossing to access certain parts of the construction areas. In the event that this use is needed during winter months when the snowmobile trail is open, Hayward Solar will coordinate with trail operators to ensure no impacts will occur and safe construction practices will be implemented at that time. If use of Trail 133 is

needed during Project construction, Hayward Solar anticipates such use to be infrequent and limited in time and location as the majority of construction would occur during non-winter periods.

Hayward Solar will construct the Project facilities within the limits of the Project Area and no road closures are anticipated during active construction. Hayward Solar will closely coordinate construction activities with County, Hayward Township and City of Hayward staff if any closures are determined necessary. The annual events hosted by the 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 public access to these events is anticipated during construction or operation of the Project.

With the possible exception of potential use of Trail 133 area during limited construction periods, no other impacts to tourism and recreational activities are anticipated. Besides the mitigative measures indicated above to address possible use of Trail 133, no mitigation measures are proposed.

4.3.4 Mining

According to the MnDOT County Pit Maps, there are no mines located within the Project Area. No active or inactive pits are located within 5 miles of the Project Area.

Impacts and Mitigative Measures

No impacts to mining operations are anticipated; therefore, no mitigation measures are proposed.

4.4 Archaeological and Historical Resources

Hayward Solar has been investigating and evaluating archaeological and historical resources at and within the Project Area over the past year. Investigations include desktop review, file searches and field studies of the Project Area. Additionally, Hayward Solar engaged cultural resource regulatory and tribal stakeholders to introduce the Project, request comments and gain feedback as detailed in Section 5 below (see also **Appendices A-1, A-2 & I-1**). As requested by the DOC and in general accordance with Governor Walz Executive Order 19-24 (dated April 4, 2019) which orders state agencies to conduct meaningful and timely consultation with Minnesota Tribal Nations, Hayward Solar sent a Project introduction letter and map the Minnesota Tribal Nations requesting feedback on the Project.

Prior to conducting cultural resources field investigations, Tetra Tech, Inc. (Tetra Tech) performed a review of records for cultural resources in February 2020 and analysis of this review is provided in the Phase I Cultural Resource Survey Report (CRS Report) dated September 15, 2020 (see **Appendix I-2**). This review included a request for data from the Minnesota State Historic Preservation Office (SHPO) and a review of the online Portal maintained by the Office of the State Archaeologist (OSA). The records review study area included the Project Area (except for a land parcel added later which is further discussed below) and a one-mile buffer. As SHPO offices were closed due to the COVID-19 pandemic, in-person review at SHPO and OSA could not be performed to review previous survey reports.

A review of archaeological data indicated that no previously recorded archaeological sites had been identified in the study area. Four architectural resources were previously recorded in the study area. Petran Farms (SHPO Inventory #FE-HRD-001) was previously recorded immediately

northwest of the Project Area. Petran Farms has not been evaluated for listing in the National Register of Historic Places (NRHP). Bridge 9727 and 9728, (SHPO Inventory #FE-HRD-009 and FE-HRD-010) are located immediately north of the Project Area. Bridge 9729 (SHPO Inventory #FE-OAK-002) is located approximately one mile east of the Project Area.

Tetra Tech's review determined a significant portion of the Project Area was historically within a large wetland suggesting that most of the Project Area was of low potential for unrecorded prehistoric cultural resources. An archaeological survey model was developed to ascertain the areas of highest potential for unrecorded cultural resources. These areas included elevated locations on the borders of the former wetland as well as locations that could contain historic structures based on a historic documents review.

Approximately 287 acres of Project Area determined to have potential for unrecorded archaeological resources (Survey Corridor) were surveyed by Tetra Tech on May 1st and 6th, 2020. Field methods consisted of pedestrian survey. No archaeological resources were identified within the reviewed Project Area Survey Corridor. One archaeological site was identified in an area that is no longer part of the Project. Site 21FE0090 is an historic artifact scatter that is recommended not eligible for listing in the NRHP. Archaeological survey of a recently added additional ~300 acres will take place on April 1 and 2, 2021. The results of the cultural resources investigations will be submitted to SHPO following completion of all fieldwork (**Appendix I-2 & I-3**). The MPUC/DOC will be updated as coordination with SHPO continues.

Impacts and Mitigative Measures

No previously recorded archaeological or historic sites will be directly impacted by the proposed Project. A Phase I archaeological survey of the Survey Corridor (high potential areas) was completed in May 2020, and no archaeological sites were identified within the Survey Corridor. The CRS Report is attached in **Appendix I-3**.

Since this survey was completed in early May 2020, the Project Area was slightly modified to include an additional land parcel at the north end of the study area north of the existing rail line at the Project Area (**Figures 2-4**). Tetra Tech will complete follow up file review and, if needed, field survey of this area in early 2021 and supplement the CRS Report as applicable. Field review of the area was completed on April 1 and 2, 2021. Follow up results will be submitted to the SHPO for review. The MPUC/DOC will be updated with the results of the survey as well as SHPO's comments.

As part of potential mitigation, an Unanticipated Discoveries Plan was developed that outlines steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction. The Unanticipated Discoveries Plan is **Appendix D** of the CRS Report attached in **Appendix I-3**.

Should previously unknown archaeological resources be inadvertently encountered during Project construction and/or operation, work will stop and the discovery will be examined by an archaeologist. If the discovery is determined to be a cultural resource, SHPO and OSA will be notified. With regard to a discovery of potential human remains, procedures would be followed to verify if the remains are human and that the appropriate authorities would become involved quickly and in accordance with local and state guidelines.

4.5 Natural Environment

4.5.1 Air

Minnesota has a good record of complying with federal air quality standards, and the State's air quality has been improving for most pollutants. Currently all areas of Minnesota are attainment areas except for an area in Dakota County (EPA 2021). Much of this decline in pollution is attributed to lowered emissions from major facility or "point sources" from enforcement of the Clean Air Act (CAA) and subsequent amendments. The CAA requires that the U.S. EPA establish National Ambient Air Quality Standards (NAAQS) for various pollutants, including carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution and sulfur dioxide. The Project Area presently meets federal air quality standards.

In recent years, because of an increased understanding of the health effects of certain pollutants, air quality standards have become stricter and acceptable thresholds for some pollutants have been lowered including the daily fine particle standard, the ozone standard, and lead standards. However, according to the MPCA *Air Quality in Minnesota: 2013 Report to the Legislature*, the majority of air pollutants of most concern today come from smaller, widespread sources that are not regulated in the way power plants and factories are and include things such as cars, trucks, construction equipment and residential wood and garbage burning.

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, PM2.5, 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 and unhealthy, or very unhealthy (MPCA, 2020b).

The Project is located nearest to the air quality monitor in Rochester, Minnesota. This station is located approximately 45 miles northeast of the Hayward Solar Project. This station monitors for O3 and PM2.5. The most recent annual AQI Days for Rochester for the years 2015-2019 is provided in **Table 21** (MPCA, 2021c).

Table 21: Days in Each Air Quality Index Category (Rochester, Minnesota)

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

Source: MPCA, 2021c.

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 days 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 Mitigative Measures

Minor temporary effects on air quality are anticipated during construction of the proposed Project as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust from wind erosion of agricultural land that becomes airborne during dry periods of construction activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Exhaust emissions, primarily from diesel and other carbon-based fueled equipment, will vary with the phase of construction. Emissions from construction vehicles will be minimized by using modern equipment with lower emissions ratings and properly functioning exhaust systems. 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. These effects will most likely be less than the historic emissions from farm machinery and fugitive dust produced during normal farming operation that would otherwise typically occur within and near the Project site.

Post-development emissions will be less than current and historic emissions due to the cessation of farming and the installation and maintenance of perennial native plantings and other vegetation planned at the Project site under solar panels and other areas disturbed by construction. While some dust may be produced from use of planned gravel access road from O&M vehicles, this emission is expected to be minimal, temporary and infrequent throughout the year. Emissions generated during operational activities will further be limited in duration and frequency from use of relatively few trucks, cars and other related O&M vehicles as part of O&M activities associated with the Project.

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions. Additional BMPs will be implemented as part of the VMP and AIMP (see Section 4.3.1 and **Appendices D & E**) which will also address emissions (e.g., mulching exposed soils, installing and maintaining vegetative cover, engineering controls, reducing vehicle and equipment speed, maintaining equipment and exhaust/mufflers, etc. Additional practices may include watering or treating haul and access roads and other exposed dust producing areas, containment of excavated material, protection of exposed soil, soil stabilization, and treating stockpiles to control fugitive dust. As part of the required construction stormwater permit that will be obtained for the Project, a NPDES construction stormwater permit and associated SWPPP will be developed prior to construction and implemented during construction that will include BMPs to minimize to potential for fugitive dust.

The Project 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 Project 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.

4.5.2 Soils, Geology and Groundwater

Soils, underlying geologic bedrock formations, groundwater and other hydrogeologic resource features of the Project Area were identified during desktop evaluations and included use of:

- applicable GIS layers (NRCS Soils of Freeborn County, Minnesota County Well Index, Karst Feature Mapping of Minnesota, USGS Topographic Mapping);
- public data sources including the Freeborn County Soil Survey (USDA 1980) and the Freeborn County Geologic Atlas (Mankato State University 1991); and
- observations made during various field studies conducted within the Project Area during 2020.

The following summarizes this information.

4.5.2.1 Soils

The Soil Survey of Freeborn County (USDA 1980) indicates that the soils of Freeborn County are primarily deep loamy soils (**Figure 12**). The soils were formed in glacial till and to a lesser extent in glacial outwash, lacustrine sediments, alluvium and organic material. The different parent materials, topography and native vegetation account for the variety of soils in the County.

The soils within the Project Area are typically drained muck or loamy muck soils or silt loam soils suited for the existing agricultural production when drained (**Figure 12**). As indicated in **Table 22,** soils within the Project Area mainly consist of silty clay loam, clay loam and muck soils with most of the land used and classified as farmland. Most of the Project Area is on level to nearly-level topography, which is consistent with the current row-crop agricultural production. Large areas of hydric soils are present across the Project Area where historic wetlands were present prior to drainage (e.g., installation of drain tiles and county ditches) or where wetlands are presently located (**Figures 9 & 15**).

Table 22: Project Area Soils

Map Unit Symbol	Map unit name	Acres	Percentage Soil Unit Hydric	Farmland Classification
377	Merton silt loam, 1 to 3 percent slopes	15.7	8	All areas are prime farmland
L84A	Glencoe clay loam, 0 to 1 percent slopes	26.2	100	Prime farmland if drained
386	Wacousta mucky silt loam	108.4	100	Prime farmland if drained
129	Cylinder loam, 0 to 2 percent slopes	1.1	15	All areas are prime farmland
190	Hayfield silt loam, 1 to 3 percent slopes	7.8	15	All areas are prime farmland
227	Lemond loam, 0 to 2 percent slopes	6.0	100	Prime farmland if drained
183	Dassel loam	6.2	100	Prime farmland if drained
392	Biscay clay loam, 0 to 2 percent slopes	76.3	100	Prime farmland if drained
940	Maxcreek-Barbert complex	23.6	95	Prime farmland if drained
160	Fieldon loam, 0 to 2 percent slopes	93.7	100	Prime farmland if drained
380	Havana silt loam	0.6	85	Prime farmland if drained
239	Le Sueur loam, 1 to 3 percent slopes	62.5	15	All areas are prime farmland
381	Newry silt loam, 1 to 3 percent slopes	0.1	8	All areas are prime farmland
252	Marshan silt loam	15.5	97	Prime farmland if drained
253	Maxcreek silty clay loam	63.4	92	Prime farmland if drained
247	Linder sandy loam, 0 to 3 percent slopes	10.1	6	All areas are prime farmland
318	Mayer loam, swales	0.7	96	Prime farmland if drained

Map Unit Symbol	Map unit name	Acres	Percentage Soil Unit Hydric	Farmland Classification
282	Hanska loam, 0 to 2 percent slopes	53.2	95	Prime farmland if drained
L13A	Klossner muck, 0 to 1 percent slopes	718.5	100	Farmland of statewide importance
255	Mayer loam, 0 to 2 percent slopes	105.9	95	Prime farmland if drained
400	Wacousta silt loam	106.8	100	Prime farmland if drained
5	Dakota loam, 0 to 2 percent slopes	4.9	6	All areas are prime farmland
L85A	Nicollet clay loam, 1 to 3 percent slopes	5.5	10	All areas are prime farmland
L83A	Webster clay loam, 0 to 2 percent slopes	16.4	95	Prime farmland if drained
L78A	Canisteo clay loam, 0 to 2 percent slopes	57.0	100	Prime farmland if drained
136	Madelia silty clay loam, 0 to 2 percent slopes	83.0	94	Prime farmland if drained
140	Spicer silty clay loam, 0 to 2 percent slopes	119.5	98	Prime farmland if drained
83	Maxcreek silty clay loam, swales	0.9	100	Prime farmland if drained
123	Dundas silt loam, 0 to 2 percent slopes	7.7	90	Prime farmland if drained
134	Okoboji silty clay loam, 0 to 1 percent slopes	65.9	100	Prime farmland if drained
393	Udolpho silt loam	8.5	97	Prime farmland if drained
391	Spicer silt loam, depressional	32.2	100	Farmland of statewide importance
300	Dassel mucky loam	54.6	100	Prime farmland if drained

The majority of the soils are hydric (approximately 74% or 1,353 acres) or predominately hydric (majority of soil components rated as hydric) (20% or 378 acres). The remaining 6% (108 acres) of soils are predominantly non-hydric (minority of soil components are rated as hydric) (**Figure 12**). The majority of soil in the Project Area is classified as muck and loamy or silty loam formed from lacustrine sediments on moraines or till plains (USDA NRCS 2019c).

According to the USDA NRCS SSURGO Web Soil Survey (USDA SSURGO 2021) (**Figure 12)**, approximately 50% of the Project Area is considered prime farmland, if drained, 38% is farmland of statewide importance. An additional 6% of the Project Area is prime farmland (USDA NRCS 2018).

Impacts and Mitigative Measures

Impacts to soils will occur during both the construction and, to a much lesser degree, operational stages of the Project. Grading impacts will primarily be with the construction of foundations for the Project Substation, O&M building, access roads, and spot grading for the solar arrays, foundations and inverter skid locations. Use of direct-embedded pier foundations for the inverters will further minimize impacts to soil.

While minimal, impacts to soils will also occur associated with the few poles to be installed for the associated transmission line. Because the Project is located on relatively level existing agricultural fields, a relatively small 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 use of low-impact equipment and methods, regrading and tilling these areas following construction.

During operation of the Project, ongoing soil compaction could occur from the use of access roads. This impact is expected to be negligible, confined to the roadbed and mainly from relatively light duty maintenance vehicles. Overall, the Project is expected to reduce the potential for erosion by establishing permanent vegetation, in contrast to the current amount of exposed soils common to row cropping in the existing agriculture fields. Potential erosion will be further minimized by dressing access roads with gravel and installing culverts under access roads where necessary to redirect concentrated surface water runoff.

Because the Project will disturb more than 50 acres, Hayward Solar will submit the NPDES application and SWPPP to MPCA for review and approval prior to construction and obtaining coverage under the General Construction Stormwater Permit program. The NPDES permit application to discharge stormwater from construction facilities will be prepared and submitted to the MPCA to acquire this permit. BMPs will be used during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion from 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 include BMPs such as silt fencing (or other erosion control devices), revegetation plans, and management of exposed soils to prevent erosion.

Implementing the Project VMP and AIMP will also further minimize and mitigate soil impacts. Finally, the Project design includes installation of stormwater runoff ponds in accordance with MPCA regulations to collect and treat runoff from the Project during its operation.

4.5.2.1 Geology

According to the Geologic Atlas of Freeborn County Minnesota (Mankato State University 1991), Freeborn County's present land surface is the result of the actions of glacial ice and its flowing meltwaters. Surface materials are primarily glacial drift deposits. These deposits are composed mostly of glacial till, characterized by a matrix of sand, silt and clay with scattered pebbles, cobble and few boulders. These deposits lay over bedrock surfaces and range in depth from 50 to 200 feet deep. The bedrock underlying this glacial drift is late Cambrian to middle Devonian sedimentary rock consisting of sandstones, shales or carbonates. This bedrock was deposited in shallow marine waters that flooded the area around 500 million years ago.

The Minnesota Geologic Society's (MGS) Depth to Bedrock mapping indicates bedrock depths are 100-200 feet below ground level in the Project Area. **Figure 13** is a map of the MGS depth to bedrock mapping in the Project Area.

Karst features are formed primarily of limestone, make the topography "porous", and make the area's water resources more challenging to protect (MPCA 2021). Contaminants can quickly find routes from the surface into groundwater. Petroleum and other chemicals leaking from underground storage tanks can quickly move into groundwater. Spilled manure can cause fish kills many miles from the release point. Chemicals used on the landscape can reappear at unexpected times and in unexpected locations.

According to the University of Minnesota, Department of Geology and Geophysics and the MNDNR Ecological and Water Resources Division's Karst Mapping, susceptible geologic features, including sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst

conditions are not present in the vicinity of the Project Area. The mapping indicates the nearest karst feature is located approximately nine miles east of the Project Area. **Figure 14** maps the Project Area and the nearest mapped karst features.

Impacts and Mitigative Measures

Due to the thickness of surficial materials of approximately 100-200 feet at the Project site (MGS, 2018), excavation or blasting of bedrock is unlikely for the Project. Karst features have not been identified at the Project site and should be not a concern for the Project. Geotechnical soil borings will be completed by Hayward Solar as Project design and engineering advances; this information will be assessed for potential impacts to geologic resources. If any, impacts of the proposed Project to available geologic resources are likely to be limited; therefore, no mitigative measures are proposed.

4.5.2.2 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: (1) bedrock; and (2) unconsolidated sediments deposited by glaciers, streams, and lakes. The Project is located within the 2-South-Central Province, which is characterized by thick clayey glacial drift with limited extent sand aquifers overlying Paleozoic sandstone, limestone, and dolostone aquifers. In this province, groundwater is typically derived from sedimentary bedrock aquifers (MNDNR, 2001).

Based on information from the USGS Ground Water Atlas, the Project Area is underlain by the Upper Carbonate aquifer system. The aquifer system consists of limestone, dolomite, and dolomitic limestone and is underlain by shale, dolomitic limestone, and limestone (USGS 1992). The dominate use of the water is for the public drinking supply (44.7%t) and agriculture (25.5%) (Mankato State University 1991). The aquifer is recharged through downward movement of water from the overlying surficial aquifer system.

According to the Geologic Atlas of Freeborn County Minnesota (Mankato State University 1991), Freeborn County's groundwater is found in unconsolidated glacial deposits and in the underlying sedimentary bedrock. The four main aquifers in Freeborn County are the Cedar Valley-Maquoketa-Galena aquifer, the St Peter-Prairie Du Chien-Jordan aquifer, the Franconia-Ironton-Galesville aquifer and the Mt Simon-Hinckley aquifer. Most wells in Freeborn County draw from the uppermost bedrock aquifer, usually the Cedar Valley-Maquoketa-Galena aquifer. The Minnesota Well Index Data (MDH 2021) indicates that the wells in the vicinity of the Project Area draw water from the Cedar Valley-Maquoketa-Galena aquifer.

Under the federal 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 Wellhead Protection Area (WHPA) encompasses the area around a drinking water well where contaminants could enter and pollute the well.

Public and non-public community water supply source-water protection in Minnesota is administered by the MDH through the Wellhead Protection program. WHPAs for public and community water-supply wells are delineated based on a zone of capture for 10-year groundwater

time-of-travel to the well and are available through a database and mapping layer maintained by MDH (MDH SWP Mapper 2021). A search for WHPAs in the MDH Source Water Protection Mapper indicated there are no WHPAs in the Project Area; the nearest WHPAs are the 6,437 acre Albert Lea Drinking Water Supply Management Area (DWSMA) around the 4,881 Albert Lea Wellhead Protection area located approximately five miles west of the Project Area and the 1,257 acre Glenville DWSMA around the 789 acre Glenville Wellhead Protection Area located approximately three miles south of the Project Area (**Figure 9**).

The MDH uses a vulnerability rating method in which points are assigned for conditions that represent a perceived risk to a well (MDH 2018). The evaluation includes each of the criteria noted below, where such information is available. Vulnerability assessments consider the following: geologic sensitivity; well construction; maintenance; and use. Higher point totals suggest relatively greater well vulnerability and vice versa. A numeric cutoff is used to categorize "vulnerable" from "nonvulnerable" wells. The Albert Lea DWSMA is classified as low vulnerability and the Glenville DWSMA is classified as moderate vulnerability by the MDH.

The MDH Well Index (**Figure 9**) maps 15 wells in the database within one mile of Project Area with average depth to groundwater ranging from 28 to 60 feet below ground surface. **Table 23** summarizes all the wells within 1-mile of the Project Area. These wells appear to be for either residential water supply or farm irrigation.

Table 23: MHD Well Index within 1 Mile of Project Area

Unique Well ID	Well Name	Well Elevation (feet/amsl)	Drilled Depth (feet)	Casing Depth (feet)	Depth to Bedrock (feet)	Well Installation Date	Well Use
103482	PACOVSKY, EDDIE	1262	155	145	110	8/7/1975	Undefined
134859	BOTHNOY, KEITH	1260	156	131	107	5/23/1977	Undefined
415343	CHRISTENSON, KEITH	1280	190	175	160	7/22/1985	Undefined
134879	HANSEN, FLOYD V.	1260	201	174	168	6/1/1971	Undefined
142658	WAGEN, WINFRED	1275	185	160	160	5/7/1977	Undefined
442241	MADSON, RICHARD M.	1265	186	171	157	7/11/1988	Undefined
139572	KROUSER, GEORGE	1270	225	198	140	9/5/1983	Undefined
132530	GAARD, MARVIN	1275	171	159	145	2/3/1977	Undefined
714768	INGEBORG LEGREID TRUST	1279	200	149	146	9/23/2004	Undefined
541395	MC AKRON, WILLIAM	1249	205	124	110	10/7/1994	Undefined
259664	HOLIDAY PARK GOLF COURSE	1249	NA	NA	NA	NA	Undefined
103506	WESTERGAARD, ELDAR	1283	173	159	140	9/29/1975	Undefined
226443	FREDIN, NORM	1249	118	113	NA	1960	Undefined
142871	GRANT, ROGER	1273	150	134	118	8/1/1978	Undefined

Unique Well ID	Well Name	Well Elevation (feet/amsl)	Drilled Depth (feet)	Casing Depth (feet)	Depth to Bedrock (feet)	Well Installation Date	Well Use
779204	SMERUD, JONATHAN & DANA	1276	260	180	NA	5/2/2011	Undefined
501429	TUFTE, BETTY	NA	171	150	NA	8/17/1989	Undefined
489840	SCHLENKER, RALPH	NA	185	131	NA	10/1/1991	Undefined
542305	LYLE, WILLIAM	NA	171	150	143	8/22/1994	Undefined
687235	HOMMERDING, TRAVIS	NA	186	166	NA	6/19/2003	Undefined
628238	PEAK, ED	NA	200	114	141	10/11/1999	Undefined
651806	LEARN, FRANK	NA	200	158	152	9/18/2000	Undefined
663277	ALLIANCE PIPELINE	NA	155	131	NA	11/6/2001	Undefined
767562	DEVRIES, DIRK	NA	186	153	NA	10/3/2008	Undefined

The Well Index indicates three irrigation wells are located within the Project Area (**Table 24,** see also **Figure 9**). The Well index indicates that the Petran Farms well (Unique ID 214500) is located approximately 400 feet north of 1200th Street and 2,800 feet east of County Road 102 in the northcentral portion of the Project Area (**Figure 9**). The Paul H. Petran well (Unique ID 214499) is located approximately 2,700 feet north of the first well (**Figure 9**). The Well Index indicates that the Steve Ladlie, LLC (Unique Well ID 0072977) well is located approximately 1,500 feet north of 190th Street and 500 feet east of 830th Avenue.

Table 24: MHD Well Index within the Project Area

Unique Well ID	Well Name	Well Elevation	Drilled Depth	Casing Depth	Depth to Bedrock	Well Installation Date	Well Use
214499	PETRAN, PAUL H.	1245	396	254	134	7/31/1956	Undefined
214500	PETRAN FARMS	1242	424	112	107	12/1/1965	Undefined
0072977	STEVE LADLIE, LLC	NA	231	231	NA	01/09/2006	Undefined

Impacts and Mitigative Measures

Due to the relatively shallow nature of construction work to be performed for the Project, impacts to groundwater resources both at the site and surrounding areas are not anticipated. Hayward Solar will be completing additional geotechnical studies closer to the construction date to further inform the Project's design, engineering, and construction techniques. As previously mentioned, there are no designated sole source aquifers or WHPAs at or nearby the Project Area.

Project facilities are not likely to affect the use of existing water wells. Project facilities within the Preliminary Development Area are located at least 600 feet from the nearest occupied residence, thereby minimizing the risk of impacts to private wells in the area. Three wells are identified within the Project Area. The status of these three wells is unknown, but the wells will be identified and avoided if possible or properly decommissioned if avoidance is impossible and the underlying landowner consents. If an unknown well is discovered that was not mapped on available mapping resources, Hayward Solar will assess whether the well is open, coordinate with the underlying landowner and cap it, if necessary and approved by the underlying landowner, in accordance with MDH requirements.

A water supply well will be installed at the O&M building as part of the Project. This well will be installed following MDH guidelines and will be for potable water in the building.

Construction of Project facilities is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock are not anticipated. Any dewatering required during construction will be managed in accordance with the SWPPP and discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts. If dewatering is necessary, Hayward Solar will obtain a Water Appropriation Permit from MNDNR if the applicable permit thresholds are expected to be exceeded during construction.

Impacts to groundwater resources (including aquifers) are not anticipated during facility operation of the Project as water supply needs will be quite limited. The O&M building will require potable water for facility personnel and O&M uses and will be satisfied with a single domestic-sized water well. A domestic water well license will be acquired by an approved well drilling contractor prior to installation, construction and use of the O&M building water well.

Based on the small amount of increased impervious surface area that will be created by Project components (access roads, inverter skids, Project Substation, O&M building, and new SMMPA Switchyard totaling approximately 26.6 acres [see **Table 6** in Section 3.2.2]), the Project will likely have minimal impacts on regional groundwater recharge. The foundations of the tracking rack system will likely be a driven steel pier and will not require concrete, although some concrete foundations may be required. The depth that the foundations will be installed at an estimated range of 10-14 feet below ground surface (depending on soil conditions) and would, therefore, not impact aquifer resources.

Project operation 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. No chemicals are planned to be used for PV module washing activities and ionized water is typically used. Herbicides may be used for vegetation management which will follow applicable regulatory use and management requirements or as required by applicable permit(s). Pesticides may be used around inverters and other electrical cabinets to control insects and any use would also follow applicable requirements.

A SPCC plan will be required for the Project Substation transformer. The transformer will be properly designed, constructed and operated per the SPCC plan and in accordance with EPA and MPCA requirements; it will be equipped with required secondary containment to contain a potential spill or leak and to prevent impacting the ground from transformer oil.

4.5.3 Rivers, Streams and Lakes

Surface water features in the Project Area and within one mile of the Project boundary are shown on **Figure 9**. No rivers, streams, lakes or MNDNR Public Watercourses or Waterbodies are within the Project site (MNDNR 2020). The nearest MNDNR Public Waterbody is Lake Albert Lea (MNDNR ID 240017400), located approximately 3 miles west of the Project Area (**Figure 9**). The nearest MNDNR Public Watercourse is a named stream (Peter Lund Creek) located approximately 0.5 miles west of the Project Area, flowing to the west into Lake Albert Lea. The National Hydrography Dataset (NHD) indicates there are no NHD mapped waterbodies within the Project Area. There are ten segments of two named NHD watercourses, comprised of public ditches, within the Project Area (**Figure 9**).

According to the Freeborn County Drainage Ditch and Tile data (**Figures 6 & 9**), the northern portion of the Project Area contains seven segments of County Ditch 62, which flows south and west into Peter Lund Creek, which then flows into Lake Albert Lea and ultimately to the Shell Rock River. The far southern portion of the Project site contains two segments of County Ditch 47 which flows west into County Ditch 62 (**Figures 6 & 9**). In addition to the mapped ditches on the site, a Y-shaped branch of the County tile system drains the northern parcel within the project area flowing to the southwest into a branch of County Ditch 62.

The National Wetlands Inventory (NWI) depicts six wetlands in the southeastern portion of the Project Area as shown in **Figures 9 & 15**. All six of these wetlands are mapped in the NWI as PEM1Af wetlands[8]. PEM1Af wetlands are wetlands in farmland that have been farmed most years but are visibly wet in two of the three consecutive image years. Wetlands within the Project Area were delineated in the field in April 2020 as shown in **Figure 15** (described in the Wetland Delineation Report dated September 18, 2020 and further discussed in the following Section **Error! Reference source not found.**).

FEMA floodplain mapping for the Project Area indicates that it is located in an Unmapped FEMA Panel (Panel Number 27047C0265 dated November 19, 2014) and is mapped as Zone X Area of Minimal Flood Hazard. FEMA defines Zone X as: Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone X is the area determined to be outside the 500-year flood elevation. The nearest Flood zones are portions of Peter Lund Creek approximately three miles west of the Project Area and the fringes of Woodbury Creek, approximately two miles east of the Project Area.

The Project Area is located within the Shell Rock River Watershed (SRRW) (**Figure 9**) which extends from south-southeastern Minnesota (in Freeborn County) into nine north-northcentral Iowa counties; the physical watershed forms part of the larger Cedar River Watershed. The SRRW in Minnesota encompasses approximately 246 square miles and lies completely within Freeborn County. The watershed is located in the Western Corn Belt Plains ecoregion and is a tributary to the Cedar River. Most of the land in the watershed area is cropland (~72%).

Three sub-watersheds in Minnesota make up the SRRW: Fountain Lake; Shell Rock River; and Goose Creek (**Figure 9**). In Minnesota, the Shell Rock River is 12 miles in length (prior to entering Iowa), and is classified as a warm-water (Class 2B) resource. The river begins at the outlet of Albert Lea Lake and is essentially flowing lake water derived from the lake's 145.9 square mile watershed. It is a low-gradient stream, lacks distinct riffle areas, and has minimal pool habitat.

The Project is further located in the eastern portion of the sub-watershed boundary called the Peter Lund Creek Sub-watershed (**Figure 9).** The Project Area drains to the Peter Lund Creek which is a minor watershed district encompassing approximately 17.9 square miles.

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[8] The USFWS NWI description code for the PEM1Af wetland type includes the: **P** System (Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergent, etc.); **EM** Class (Emergent characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens); **1** Subclass Persistent (dominated by species that normally remain standing at least until the beginning of the next growing season); **A** Water Regime Temporary Flooded (surface water is present for brief periods, but the water table usually lies well below the ground surface for most of the season); and special modifier **f** Farmed (f armed wetlands occur where the soil surface has been mechanically stripped or physically altered for production of crops, but where hydrophytes would become reestablished if the farming were to discontinue).

As indicated in the 2014 Second Generation Water Management Plan (WMP - dated December 31, 2015), the SRRW begins in the extensive tile networks of its agricultural lands which flow into a network of ditches and straightened streams before entering a series of lakes around Albert Lea. The Shell Rock River begins at Albert Lea Lake and flows south through the Iowa border where it joins the West Fork of the Cedar River near Cedar Falls, Iowa after 113 miles.

No other surface water resources other than those above are located within a mile of the Project Area.

Impacts and Mitigative Measures

The Project is being designed and engineered in a manner to avoid and minimize impacts to wetlands and water resources to the greatest extent practicable. During construction appropriate BMPs will be implemented and maintained to additionally mitigate potential impacts in accordance with a MPCA construction stormwater permit and SWPPP that will be in place for the Project. During operation, stormwater ponds will be used to collect and treat/discharge runoff following MPCA regulations.

Potential impacts to water resources and applicable mitigative measures are discussed in more detail in Section **Error! Reference source not found. Error! Reference source not fo und.**. No impacts to MNDNR Public Waters or FEMA floodzones are anticipated; therefore, no other mitigative measures are proposed.

On March 26, 2021 the Shell Rock River Watershed District (SRRWD) issued a letter of support for the Project. The SRRWD letter indicates that the District is in the process of completing its One Watershed, One Plan, water management plan and that habitat and native vegetation are critical factors of success to the plan. The SRRWD indicated support of the vegetation and habitat management plans that are being included in the SPA for the Project and that such grasses and plantings will reduce some existing issues the SRRWD is seeing near the Project with erosion, stream sedimentation and increased phosphorous. The SRRWD also indicated that this Project can be restorative to soil nutrient levels while providing stabilization to topsoil that can be lost when agricultural lands are tilled. Hayward Solar will continue to discuss the Project with SRRWD staff as permitting of the Project advances. Stakeholder outreach efforts and results like this are included in the SPA document.

Specific to the SRRWD, there are a number of measures and actions that Hayward Solar would take in designing, constructing and operating the Project that would directly and indirectly benefit and improve the water quality in this District, including:

1. the Project would decrease the amount of nutrients (including phosphorous and nitrogen) applied to the Preliminary Development Area during the 30-35 year life of the Project (i.e., row crop agricultural operations would temporarily cease during Project operation);
2. nutrients at the Project site would be better managed through incorporation, installation, establishment and maintenance of native vegetative plant species, as detailed in the VMP and AIMP that will be implemented for the life of the Project;
3. a stormwater management system (i.e., stormwater pond) will be designed, engineered, constructed and operated in accordance with applicable MPCA rules and regulations which will effectively address stormwater runoff from the Project site;

4. during construction of the Project, a NPDES construction stormwater runoff permit will be obtained from the MPCA and a SWPPP will be implemented before, during and after construction to address, manage and control erosion, stormwater runoff from construction activities and re-establishment of vegetative cover post-construction;

5. with the installation and establishment of native prairie vegetative cover in combination with the stormwater management facilities (ponds) to be in place during operation of Project facilities, water storage capacity may be increased and control structures could help improve site soil health and related conditions. While existing county drain tile and judicial drainage ditches will be maintained across the Project site to maintain neighboring agricultural land uses and field drainage, installation of the above Project facilities will improve downstream water quality, and improve site soils over time; and

in addition to the above benefits, Hayward Solar will explore active involvement in additional SRRWD watershed management plan-stated goals, including assisting with on-going monitoring of water quality at the Project site, conserving and restoring upland and wetland to provide natural buffering to upstream pollutants (in addition to Project plans that accomplish this already), enhancing native vegetation to increase waterfowl nesting areas, finding ways to engage more local capacity and funding sources, engaging the public through BMP cost share projects, and conducting education and public outreach using the Project as an example.

4.5.4 Wetlands

Wetlands were delineated in the Project Area by Tetra Tech from April 27-30, 2020, and April 1-2, 2021 (**Appendix K**). The wetlands and streams delineated by Tetra Tech are indicated on **Figure 15**. There are no NWI or NHD water resources mapped on this portion of the Project Area and none were identified in the field delineation. There are hydric soils mapped on this portion of the Project Area. A review of aerial photography indicates there are two suspect areas that could be delineated as wetlands.

The results of the Tetra Tech field delineation are described in the Wetland Delineation Report dated September 18, 2020, which was subsequently updated in April 2021 (**Appendix K**). The delineation was completed using a level two routine determination method set forth in the USACE 87 Manual and the Midwest Regional Supplement. A total of 17 wetlands were identified during the field survey for the Project. These wetlands were delineated as PEMA, PEMAf, PEMAx, PEMB, PEMC, or PEMCx as indicated in **Table 25** below (see also **Figure 15**).

Table 25: Delineated Wetland Summary Table

Wetland ID	Wetland Classification		Area (acres)
	Circular 39	Cowardin	
WA001	Type 1	PEMAf	0.97
WA002	Type 1	PEMAf	0.77
WA003	Type 1	PEMAf	1.01
WA006	Type 1	PEMAf	1.75
WA007	Type 1	PEMAf	0.31
WA013	Type 1/3	PEMAf/PEMAx/PEMCx	2.69
WA015	Type 1/3	PEMAx/PEMCx	0.77
WA016	Type 1	PEMAx	0.72

Wetland ID	Wetland Classification		Area (acres)
	Circular 39	Cowardin	
WA019	Type 1	PEMAf	0.15
WA021	Type 1	PEMAf	0.15
WA025	Type 1	PEMAf	0.35
WA033	Type 1	PEMAf	0.43
WA039	Type 1/2/3	PEMA/PEMC/PEMB/PEMCx	2.63
WA045	Type 1	PEMAf	0.75
WA046	Type 1	PEMAf	1.77
WA047	Type 1	PEMAf	3.26
WA054	Type 1	PEMAf	0.89
Total Delineated Wetland Acreage in Project Area			**19.37**

A total of six intermittent ditches (R4SBAx, R4SBCx), and two perennial ditches (R2UBHx) were delineated within the Project Area (**Figure 15**). Delineated Ditches are summarized in **Table 26** below.

Table 26: Delineated Ditch Summary Table

Stream ID	Ditch Type	Cowardin Class	Ditch Name	Average Width (ft)	Surveyed Length (ft)	Surveyed Area (acres)
SA008	Intermittent	R4SBCx	Unnamed	15	3,600	1.12
SA009	Perennial	R2UBHx	County Ditch Number 12	28	7,270	5.00
SA012	Intermittent	R4SBCx	Unnamed	30	5,200	2.83
SA013	Intermittent	R4SBAx	Unnamed	5	1,300	0.15
SA042	Intermittent	R4SBCx	Unnamed	20	3,825	2.06
SA049	Perennial	R2UBHx	Unnamed	35	2,130	1.72
SA050	Intermittent	R4SBCx	Unnamed	18	4,995	1.91
SA053	Intermittent	R4SBCx	Unnamed	18	3,015	1.26
Total Within Project Area					31,335	16.00

Delineated wetland boundaries were reviewed in the field by the Freeborn County Technical Evaluation Panel (TEP) on October 8, 2020. Following the TEP meeting, the official approval of the delineated wetland boundaries from the Freeborn County SWCD was received in a Notice of Decision dated October 27, 2020 (**Appendix K**). A letter dated December 14, 2020 approving the delineated wetland boundaries from the USACE was also issued for the Project (**Appendix K**). Delineated wetlands comprise 19.37 acres (**Table 25**), approximately 1% of the Project Area overall. **Figure 15** depicts the location and extent of delineated wetland boundaries.

It should be noted that Tetra Tech delineation did not initially include the northernmost ~30 acres or southwestern most ~300 acres of the Project Area (**Figure 15**) because these areas were added to the Project Area after initial work in 2020 was completed. The ~30 acres is the portion of the Project located immediately south of I-90 and north of the rail line and the ~300 acres is the portion at the southwest corner of the Project Area. Both areas were field delineated in early April

2021 and new findings will be provided to the USACE, Freeborn SWCD and other applicable regulatory agencies as needed when the field data is compiled.

Impacts and Mitigative Measures

The Project is being designed in a manner to avoid and minimize impacts to wetlands and water resources to the greatest extent practicable as shown in the Preliminary Facility Design (**Figure 4**) and Preliminary Site Plan (**Appendix B**). Wetlands and ditches within the Hayward Solar Project are potentially regulated under:

- The Minnesota Wetland Conservation Act of 1991, as amended, administered in this area by the Freeborn County SWCD;
- Section 404 and 401 of the Federal Clean Water Act administered by the USACE and the MPCA; and
- Minnesota Statute 103G.245, administered by the MNDNR.

Potential impacts to wetlands on the Project may include temporary impacts associated with the installation of electrical collection lines and temporary access roads during construction of the Project. No access road or Project facilities (Project Substation, O&M building, new SMMPA Switchyard, transmission line/poles) are located in a wetland or water resource area. Permanent impacts may result if direct-embedded piers require concrete foundations to address problematic soil conditions and from the establishment of access roads for operation of the Project.

The driven piers used to support the solar arrays and inverter skids are not anticipated to result in a loss of wetland under the 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 (Minnesota Rules 8420.0111, subp. 26 and 32). Further, the driven piers are not expected to constitute wetland fill under Section 404 of the CWA as they likely to fall under a structural discharge activity of the USACE Minnesota Regional General Permit (RGP)-003.

Temporary construction impacts will be minimized by using BMPs 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. Construction operations will be designed and controlled to minimize and prevent material discharge to nearby wetlands.

Depending on final Project design, a Joint Application Form for Activities Affecting Water Resources in Minnesota may be submitted for the Hayward Solar Project; the Joint Application is the accepted means for initiating review of proposals that may affect a water resource (wetland, tributary, lake, etc.) in the State of Minnesota under state and federal regulatory programs. The need for this approval will be evaluated with final Project design information.

Applicants for MNDNR Public Waters permits must use the MPARS online permitting system for submitting applications to the MNDNR. However, because the Project facilities do not cross Public Waters, Hayward Solar does not anticipate this MNDNR permit is required for the Project.

<u>Minnesota Wetland Conservation Act</u>

Depending on the final wetland impacts associated with the Project and final Project design, construction activities may qualify for a No Loss, exemption, or require a permit under the WCA. If a permit is required, any proposed wetland impact would require full sequencing under the WCA and address wetland avoidance, impact minimization, rectification, and replacement (if applicable). The need for this will be determined as final Project design is completed.

Section 404 of the Federal Clean Water Act

Under Section 404 of the federal CWA, the USACE regulates the discharge of dredged and fill material into waters of the U.S. After coordination and application submission, authorization from the USACE would likely fall under one of the categories of activities of the Minnesota RGP-003.

Section 401 Water Quality Certification

Projects required to obtain an Individual Section 404 Permit are also required to obtain an MPCA Section 401 Water Quality Certification (WQC) to ensure they comply with the State water quality standards in Minnesota Rules Chapter 7050, as amended. If the Project secures approval under Minnesota RGP-003, Section 401 WQC is automatic provided the Project follows the specific pre-determined certification requirements. Because the Project is unlikely to require an Individual Section 404 Permit from the USACE, a project-specific, MPCA Section 401 WQC is unlikely to be required as part of the wetland permitting process.

Minnesota Public Waters Act and MNDNR Public Waters Permits

The MNDNR requires a Public Waters Work Permit for any alteration of the course, current, or cross section below the Ordinary High Water level of MNDNR public waters, wetlands, and watercourses. Because no MNDNR public watercourses or waterbodies are mapped or have been identified within the Project Area, no impacts to the MNDNR public watercourses are expected from the Project. Therefore, a Public Waters Work Permit will not be required for the Project.

Should the Project result in permanent, unavoidable impacts to wetlands or water resources, impacts will be replaced in accordance with the WCA and Section 404 of the federal CWA. Additionally (and as applicable) the Project will comply with MNDNR/Minnesota Board of Water and Soil Resources (BWSR) buffer rule around public ditches.

4.5.5 Vegetation

The Project Area lies within the Oak Savanna subsection of the Minnesota and Northeastern Iowa Morainal section of the Eastern Broadleaf Forest Province, as defined by the MNDNR Ecological Classification System (ECS) (1999). The ECS system categorizes regions of the State using associations of factors such as climate, geology, topography, soils, hydrology, and vegetation.

The MNDNR Minnesota Land Cover Classification System (MLCCS) incorporates more detailed land cover information including human-modified cover classifications; however MLCCS data does not cover the Project Area. The National Land Cover Database (NLCD) data was used as an alternative for general land cover descriptions in the Project Area. According to the NLCD, a majority of the Project Area consists of cultivated crops/hay/pasture (97%). Error! Reference s ource not found.7 summarizes the land cover classifications according to the NLCD. NLCD Land cover mapping is depicted in **Figure 10**.

Table 27: NLCD Land Cover

Land Cover Type	Acres	Percent of Project Area
Cultivated Crops/Hay/Pasture	1,892.94	96.66%
Developed (open space to high intensity)	63.06	3.22%
Herbaceous	2.27	0.11%
Deciduous Forest	0.13	0.01%
Total	**1,958.40**	**100%**

The Minnesota Biological Survey (MBS) includes areas of the State with varying levels of native biodiversity and may contain high quality native plant communities, rare plants, animals, and/or animal aggregations. According to the MBS Sites of Biodiversity Significance, there are no sites within the Project Area; however, there is one site assigned a high rank for biodiversity significance just northwest of the Project Area (**Figure 16**). The aforementioned MBS site also corresponds with a mapped Native Plant Community (NPC). There are no NPC sites within the Project Area.

The National Conservation Easement Database (NCED) provides a comprehensive picture of privately owned conservation easement lands in the U.S. A review of this data indicated there are no NCED areas within the Project Area.

Impacts and Mitigative Measures

Little impact to vegetation will occur as a result of construction and operation of the Project. Since there are no Minnesota County Biological Survey, NPC or NCED sites mapped within the Project Area, impacts are unlikely, and other wetland, forest and potential native plant communities will be avoided to the extent practicable.

A majority of the Project infrastructure and facilities are located within areas currently in row-crop agriculture. A limited amount of tree clearing may be necessary to prevent shading of some panels; however, the Project was designed to avoid and minimize the need for tree removal and relatively few trees are located within the Project Area. Overall the Project will result in a net improvement to vegetative cover in the Project Area because of revegetation efforts in former agricultural areas and the significant decrease in the use of herbicides and pesticides typical of agricultural practices through implementation of the Project AIMP and VMP plans (discussed above), as well as the SWPPP.

Hayward Solar will avoid and minimize impacts to vegetation to the extent practicable within the context of the Project and applying applicable buffers and setbacks. Hayward Solar has designed the Project utilizing a PV system of single-axis trackers which minimize the amount of ground shading on the Project site. The PV system is installed on driven pier foundations which minimizes the amount of ground disturbance associated with installation. Land disturbance is limited to what is necessary to establish fences, access roads, rack installations, array grading, O&M building, Project Substation, SMMPA Switchyard, and temporary laydown/staging areas used during construction. During construction Hayward Solar will implement the SWPPP developed for the Project site and BMPs to prevent erosion and promote soil stabilization in disturbed areas, as well as implement the AIMP and VMP plans.

To mitigate potential impacts to vegetation, Hayward Solar anticipates site restoration, seeding, establishing, maintaining and monitoring disturbed areas and areas below the PV arrays in accordance with the AIMP and VMP plans. Control of invasive and noxious weeds will be ongoing during the operation of the Project.

4.5.6 Wildlife

As noted in Section 4.5.5 above, vegetative cover in the Project Area consists of four main cover-types: Cultivated Crops/Hay/Pasture (97% of Project Area), Developed (3%), herbaceous cover (0.1%) and forest (0.01%) as shown in **Figures 10 & 16**.

Overall the Project Area is dominated by agriculture land primarily used for row crop production; primarily corn and soybeans. These are annual temporary cover types that will be utilized by a small number of common wildlife species on a limited seasonal basis. Species that will utilize these areas include white tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*) and woodchuck (*Marmota monax*). During Project development, agricultural land within the Project Area will be seeded with native perennial grasses, apart from the Project Substation, O&M building, SMMPA Switchyard, inverter skids, and access roads, which will be converted to developed land and impervious surfaces. The conversion of row crops to perennial grasses will create higher quality habitat, which in turn, benefits wildlife.

Bird species that will utilize these areas include ring-necked pheasant (*Phasianus colchicus*), red-winged blackbird (*Agelaius phoeniceus*) and other small perching birds and common raptors such as red -tail hawks (*Buteo jamaicensis)*. After harvest, the fields may offer short term foraging areas for common waterfowl including Canada geese (*Branta Canadensis*) and mallards (*Anas platyrhynchos*). The conversion of row crop production to native perennial grasses will provide habitat for ground nesting birds.

Reptiles and amphibians accustomed to agriculture habitats, including common garter snake (*Thamnophis sirtalis*), northern leopard frog (*Lithobates pipiens*) and American toad (*Anaxyrus americanus*) will also use the cropped fields at certain times of the year for foraging. However, due to the relative lack of diverse vegetation cover and habitat structure, and the temporary seasonal nature of the cover, even these common species' use of the cropped field habitat is likely limited to occasional foraging in the fields.

Impacts and Mitigative Measures

The Project layout is designed to avoid those portions of the Project Area with the highest concentration of high quality habitat and water resources. BMPs outlined in Sections 4.5.4 and 4.5.5 concerning wetlands and vegetation will serve to protect, prevent and mitigate potential impacts to vegetation within the Project Area. The SWPPP, AIMP and VMP plans will also be implemented during construction, post-construction and operational phases of the Project. With vegetation being converted from row crop production to native perennials, impacts on wildlife will be positive. The establishment of native perennials will reduce soil erosion and runoff, introduce nutrients into the soil, reduce the use of pesticides and herbicides, and provide beneficial habitat to pollinator species and ground nesting bird species.

Movement of large mammals, such as white-tailed deer, will not be impeded within the Project Area. As discussed in Section 3.1.6 above, lightweight agricultural woven wire fencing extending approximately 8 feet above grade will be used around the Project arrays/construction units for safety and security purposes to prevent larger wildlife and the public from access Project electrical

equipment. This fencing will be topped by 3-4 strands of smooth wire (and not barbed wire). There will be wide corridors between fenced areas throughout the Project Area (see **Figure 4** & **Appendix B**). The arrangement of the fenced areas of the Project array relative to existing roads and utilities provide various pathways through the Project Area which would allow wildlife to cross. These corridors will allow larger wildlife various options to cross unimpeded through the Project Area.

4.5.7 Rare and Unique Natural Resources

Tetra Tech submitted a formal MNDNR Natural Heritage Information System (NHIS) Data request for the Project Area on January 4, 2021 (**Appendix A-1 & Appendix L**). In response, the MNDNR reviewed the proposed Project and stated the Project will not negatively affect any known occurrences of rare features.

USFWS Information for Planning and Consultation (IPaC), received on April 2, 2021, (**Appendix L**) identified one federally threatened species (the northern long-eared bat [*Myotis septentrionalis*; NLEB]) within or near the Project Area. Suitable NLEB habitat consists of a variety of forested habitat near water sources (MNDNR 2018). According to MNDNR and USFWS (2020), there are no known NLEB maternity roost trees or hibernaculum in Freeborn County.

The USFWS (2018) adapted a habitat connectivity model for the federally endangered rusty-patched bumble bee (*Bombus affinis*; RPBB), to identify the zones around current (2007-2017) RPBB records where there is a high potential for the species to occur. 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 the greatest potential for species presence. RPBB presence is assumed within High Potential Zones where suitable habitat is present. 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; and Uncertain Zones, which contain the maximum dispersal potential from historic records of the species observed between 2000 and 2006. According to this model, there is approximately 352 acres of RPBB Low Potential Zone within the one-mile Project buffer (**Figure 16**). Nesting sites include underground and abandoned rodent cavities or clumps of grass (i.e., bunchgrasses), and overwintering sites include patches of undisturbed soil along woodland edges (USFWS 2017).

Impacts and Mitigative Measures

The Project Area is highly disturbed (97% cultivated crops/hay/pasture and 3% developed areas), therefore water resources and high quality habitat will be completely avoided. The MNDNR formal response to the NHIS request for the Project did not identify species of concern and the MNDNR stated the Project will not negatively affect any known occurrences of rare features.

No negative impacts on rusty patched bumble bees are expected because the RPBB Low Potential Zone does not fall within the Project Area, and with the establishment of native perennials, negative impacts to Rusty patched bumble bee is not expected. There are very few trees and water sources within the Project Area, so impacts to northern long-eared bat and their habitat is not expected. Additionally, few trees are expected to be removed for construction of the Project.

BMPs outlined in Sections 4.5.4 and 4.5.5 concerning wetlands and vegetation will serve to protect, prevent and mitigate impacts to potential rare features within the Project Area. The SWPPP, AIMP and VMP will also be implemented during construction, post-construction and

operational phases of the Project, when applicable. Hayward Solar will also provide training to on–site personnel to educate and avoid impacts to potential rare features.

4.6 Climate Change

Minnesota is recently more actively taking action against 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. As indicated in EO 19-37, climate change is a complex problem, of which the impacts disproportionately affect disadvantaged communities. As such, EO 19-37 indicates that State leaders and policy makers must consider existing disparities based on race, gender, geography, and economic status in the State's response to climate change and consider equity in decision making (MPCA 2020).

The Next Generation Energy Act (NGEA) of 2007 set statutory goals to reduce greenhouse gas emissions in the state by 30% of 2005 levels by 2025, and 80% by 2050. Minnesota fell short of its 2015 goal of 15% and is not on track to meet the 2025 goal (EO 19-37). 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 (MPCA 2020).

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. Additionally, as described above, the Hayward Solar Project is expected to offset approximately 261,871,072 pounds (118,783 metric tons) of carbon dioxide equivalent annually and provide electricity for approximately 28,000 homes annually (EPA 2020).

While solar projects do offset a large sum of greenhouse gases, there are emissions to be considered. Generally speaking, the amount of CO2 equivalent (CO2eq) produced during the lifespan of a solar project comes out to approximately 20-50 grams per kilowatt (National Renewable Energy Laboratory [NREL], 2012). About 60-70% of that comes from the manufacturing of the panels and construction of the solar farm. Another 20% of the CO2eq comes from the operational processes and the rest comes from decommissioning and disposal. However, the solar farm pays off this debt within approximately three years of operation (GVEC Solar, 2021). While there is an initial carbon debt that needs to be "paid off," solar farms have a far smaller carbon debt to pay off than fossil fuels, so the carbon footprint of the area is immediately reduced.

The Project has been designed with resiliency in mind as climate continues to change in Minnesota. 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, which is of importance to Project engineers when designing stormwater infrastructure that will be in place for the life of the Project. Reviewing the historical frequency of heavy rainfall events was done by NOAA Atals-14 to also look at the potential for increased heavy rainfall in the

future due to climate change. However, there were not any conclusions drawn on how to estimate what those increases may look like for the Midwest (NOAA Atlas 14 Vol 8, 2013). NOAA Atlas 14 Volume 3, prepared for Puerto Rico and the US Virgin Islands, indicates that there has not historically been a consistent impact of climate change on the annual maximum series of precipitation (NOAA Atlas 14 Vol 3, 2008).

Impacts and Mitigative Measures

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

4.7 Potential Cumulative Impacts

As defined in Minnesota Rules 4410.0200, subp. 11, "cumulative impact" means the impact on the environment that results from incremental effects of the project in addition to other past, present, and reasonably foreseeable future projects regardless of what person undertakes the other projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Minnesota Rules 4410,0200, subp. 11a defines cumulative potential effects as:

> "... the effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects."

Cumulative impacts are combined, incremental effects of human activity. These impacts are to be understood to in relation to other past, present, and reasonably foreseeable future actions regardless of who takes the action. While an individual activity may be insignificant by itself, minor impacts in combination with other actions may cause a larger issue in a region or to an important resource. Potential cumulative impacts could arise from other projects or significant activities being built or taking place within the environmentally relevant area.

Hayward Solar is not aware of other existing or planned for solar energy generation projects to be located in Freeborn County. Hayward Solar has maintained several relationships with various stakeholders throughout the development of the Project. These stakeholders included federal, state, and local agencies, as well as local organizations, the local community, and landowners. As discussed in Section 5, Hayward Solar has conducted extensive agency, municipal and landowner/public outreach for the Project. No information concerning plans for other solar energy projects, other infrastructure projects or other project in the vicinity of the Project Area was identified in that outreach effort. Additionally, Hayward Solar has no plans to expand the Project after it is constructed.

A review of the Freeborn County website, and known MnDOT District 6 projects, did not reveal any projects proposed or planned within or near the Project Area that would be expected to interact negatively, or create significant cumulative impacts with the proposed Project.

Impacts and Mitigative Measures

Other planned projects in the Project vicinity have not been identified by Hayward Solar that

would contribute to potential cumulative impacts with the Project; therefore, no mitigative measures are proposed.

4.8 Unavoidable Impacts

The Hayward Solar 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 environmental are not entirely avoidable; temporary minor impacts will occur in some circumstances. Hayward Solar has taken steps to minimize the long-term effects of these impacts by implementing mitigation measures where warranted.

Impacts and Mitigative Measures

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 summarized below. The majority of these unavoidable impacts will be temporary in nature, will occur during Project construction, and will be rectified through SWPPP, VMP and AIMP plan 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;
- Wildlife displacement; and
- Exposed soils from grading activities and potential for soil erosion and sedimentation.

While temporary, 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; and
- Infrequent vehicle trips from maintenance vehicles traveling to and from the site.

Beyond the above-described mitigative measures that will be implemented for the Project, no other mitigation is proposed.

5.0 Agency and Public Outreach

Prior to preparing and filing this Application, Hayward Solar completed extensive and comprehensive engagement with local, state and federal regulatory stakeholders to introduce the Project, request comments and gain feedback. Additionally, Hayward Solar contacted the eleven recognized Minnesota Tribal Nations for comments. To assist with and implement this effort, Hayward Solar employed Good Steward Consulting (GSC), a community relations, public affairs/communication consultancy focusing on renewable energy projects which is based in Albert Lea, MN. Hayward Solar and GSC will continue to engage with interested stakeholders throughout the CN application and Application process.

On December 16, 2020, Hayward Solar sent a Project introduction letter and map to federal and state agencies, Minnesota Tribal Nations, and local cities and townships requesting feedback on the Project, its' location, resources in the Project vicinity, required permits and approvals, known constraints and other potential concerns[9]. The agency list and sample of the outreach letter are included in **Appendix A-1**. Correspondence from Minnesota Tribal Nations are included in **Appendix I**. The agencies and stakeholders contacted are summarized in **Table 28** along with dates of follow up correspondence.

Responses received as of April 20, 2021 are included in **Appendices A-2, I, K & L**. A summary of responses and meetings with stakeholders is included in the table below. Hayward Solar and GSC will continue to work with local, state, federal agencies, and Minnesota Tribal Nations as the Project advances.

Table 288: Summary of Correspondence

Agency	Response Date and Summary
Federal	
USACE, St. Paul District	Regulatory file/submission letter dated October 13, 2020, indicating receipt of delineation review. On December 14, 2020, the USACE issued a letter indicating it had completed preliminary review of the Project wetland delineation report, the USACE generally concurred with water resource boundaries shown and the delineation can be used for planning and permitting purposes. (See **Appendix K**).
USFWS – Minnesota Wisconsin Field Office	No formal written response to date. IPaC (listing of species) responses were obtained on January 19, 2021 and April 2, 2021 from the USFWS for the Project (see **Appendix L**). (Note a joint meeting with USFWS and MNDNR staff and Project representatives was held on December 22, 2020 to discuss the Project. See summary below).
Federal Aviation Administration	No written response to date. (Note a telephone call took place on December 22, 2020 regarding FAA filing options for the Project.)
State	
Minnesota Historical Society – SHPO	Phase 1 Archaeological survey recommended in writing on January 21, 2021. (See **Appendix I**).
MNDNR	MNDNR issued initial Natural Heritage Review letter for the Project on May 20, 2020 (see **Appendix L**). Follow up response on December 18, 2020, requesting a shapefile of the Project. Early coordination comments sent via email on January 27, 2021. (Note a joint meeting with USFWS and MNDNR staff and Project representatives was held on December 22, 2020 to discuss the Project. See summary below). Follow up requests for updated Natural Heritage Review were made to the MNDNR. Review is attached in **Appendix L**.
Minnesota Pollution Control Agency (MPCA)	No response to date.
Minnesota Department of Agriculture (MDA)	Written response on January 19, 2021 indicated guidance on the AIMP and VMP are to be given, but general Project guidance cannot be given until those are ready. (Note a meeting with MDA staff and Project representatives was held on December 10, 2020 to discuss the Project. See summary below). Comments from MDA on the

[9] Note that the introduction/request for comment letter was both emailed (December 16, 2020) and sent via U.S. Postal Service. Also, Hayward Solar sent an introductory letter to the USACE on January 4, 2021.

Agency	Response Date and Summary
	Project Draft AIMP were received on March 22, 2021. Comments from MDA on the Project Draft VMP were received on April 7, 2021.
Minnesota Department of Transportation – District 6 (MnDOT)	On December 21, 2020, MnDOT requested a more detailed map of the that includes driveways and clearer boundaries of easements to help identify potential right-of-way issues. As of January 7, 2021, MnDOT has requested site plans that include driveways and clearer boundaries of easements to help identify potential right-of-way issues. Map was sent on January 12, 2021. As of February 23, 2021, MnDOT has no other concerns.
Minnesota Department of Commerce (DOC)	No written response to date. (Note a meeting with the DOC and Project representatives was held on December 14, 2020 to discuss the Project. See summary below.)
Minnesota Department of Employment & Economic Development (MDEED)	No response to date.
Minnesota Department of Health	No response to date.
Local	
Freeborn County Board of Commissioners	No written response to date. (Note a phone call with Dan Belshan, Freeborn County Commissioner and Project representatives took place on January 8, 2021 to discuss the project and a meeting between Freeborn County Commissioners and Project Representatives occurred on January 19, 2021 and February 16, 2021. See summary below.)
Freeborn County Public Works	Phil Wacholz- County Engineer and Director of Public Works participated in the Introduction meeting held on January 11, 2021. Phone call with Ted Herman on February 3, 2021. See summaries below.
Freeborn County Environmental Health	Meeting with Rachel Wehner on August 19, 2020 prior to submitting the wetland delineation report for review. Her comments on the delineation report were issued on October 27, 2020. Rachel Wehner- Freeborn County Environmental Health Coordinator participated in the Introduction Meeting held on January 11, 2021.
Freeborn County SWCD	No response to date.
Hayward Township	No written response to date. (Note a meeting with the Hayward Township Board of Supervisors and Project representatives was held on January 6, 2021 to discuss the Project. See summary below.)
City of Hayward	No written response to date. (Note a Hayward City Council meeting took place on February 8, 2021. The Hayward Solar Project was introduced during the public forum. See summary below.)
Albert Lea Economic Development Agency (ALEDA)	Originally contacted on October 12, 2020 to introduce the idea of the Project. Meetings have been held on November 5, 2020 and November 18, 2020. See summary below.
Shell Rock River Watershed District	Originally contacted on November 16, 2020 to discuss and explain the type of project. Meetings with SRRW District with Project representatives have been held on January 29, 2021 and February 12, 2020. Letter of Support received on March 26, 2021. See summary of meetings below.
Albert Lea Area Schools	No response to date.

Federal written correspondence has included the FAA's and USFWS's responses, with USFWS advising Hayward Solar to use their IPaC system to receive the most beneficial feedback. Hayward Solar used the IPaC and results are in Section 4.5.7. The FAA suggested filing even though the Project does not exceed the notice criteria, to which Hayward Solar complied.

State of Minnesota correspondence has included responses from the MNDNR, MnDOT, MDA, and SHPO. The MNDNR's Cynthia Warzecha advised Hayward Solar that the contact until submission of the Application would be Joanne Boettcher. Ms. Boettcher recommended referencing MNDNR's Commercial Solar Siting Guidance; using GIS data layers; establish native, pollinator friendly vegetation; submitting an updated NHIS review request for any change in Project footprint; and wildlife friendly erosion control and invasive species prevention best management practices. Thorough field investigations, minimizing impacts to wetland or mucky soils, avoidance of the native prairie remnants, and stringent erosion control efforts were also recommended.

Hayward Solar referenced the MNDNR's Commercial Solar Siting Guidance throughout the Aapplication process and has included several GIS data layers in figures throughout this Application. These layers were also referenced and native prairie remnants avoided when designing the Project. As seen in the VMP, native, pollinator friendly seeds will be planted, and invasive species prevention best management practices will be used (**Appendix E**). Hayward Solar is committed to stringent erosion control. This will be reflected in the SWPPP that will be prepared for the Project. Additionally, minimizing impacts to wetland or mucky soils is outlined in the AIMP (**Appendix D**).

MnDOT's John Keranen called to request a more detailed map of the proposed highways and planned Project access points to public roads which were provided. MnDOT recommendations about driveway placement were also given and utilized in the Aapplication. As of February 23, 2021, MnDOT has no other concerns. MDA's Steve Roos, DOC, and MNDNR were provide draft copies of the VMP and AIMP for review and comment. Mr. Roos provided comments on the draft AIMP in March 2021 and Hayward Solar revised the AIMP based upon these comments and will continue to work with the MDA as needed to complete the AIMP. On April 7, 2021 the DOC provided combined agency comments on the draft VMP to Hayward Solar. Hayward Solar revised the VMP using these comments and will continue to work with the agencies as needed to complete the VMP.

A formal letter of support from the Shell Rock River Watershed District was written and received by the Applicant on March 26, 2021. In regards to other local agencies and organizations, no written responses have been received but several meetings have been held as detailed below.

Table 29 includes a summary of tribal responses to Project outreach efforts to date. Hayward Solar will continue to update the Minnesota Tribal Nations on the Project and will keep the Nations informed during the comment period. All Tribal Correspondence can be found in **Appendix I**.

Table 29: Summary of Tribal Correspondence

Tribes	
Tribal Historic Preservation Office Lower Sioux Indian Community	No response to date.
Tribal Historic Preservation Office Upper Sioux Community	An Upper Sioux Community representative sent an email on February 5, 2021 indicating no known sites with direct APE; however, they were aware of sites in the area. The representative requested a copy of the report. When complete, copy of the cultural resource report will be sent.
Tribal Historic Preservation Office Prairie Island Indian Community	No response to date.
Shakopee Mdewakanton Sioux Community	A Shakopee Mdewakanton Sioux Community representative sent a request on December 18, 2020 to be kept informed of Project progress and be notified in the event of an inadvertent discovery.
Bois Forte Tribal Historic Preservation Office	No response to date.
Fond du Lac Tribal Historic Preservation Office	No response to date.
Grand Portage Tribal Historic Preservation Office	No response to date.
Leech Lake Tribal Historic Preservation Office	No response to date.
Mille Lacs Tribal Historic Preservation Office	No response to date.
Red Lake Nation	No response to date.
White Earth Nation Tribal Historic Preservation Office	No response to date.
Minnesota Indian Affairs Council Cultural Resources	No response to date.

Responses from Tribal Nations have been limited to a response from the Shakopee Mdewakanton Sioux Community in which it was requested that they be informed of Project progress and be notified should any applicable discoveries be made, and a response from the Upper Sioux Community in which they indicated no known sites in the direct APE and requested a copy of the report. Hayward Solar is committed to informing the Shakopee Mdewakanton Sioux and Upper Sioux Communities, as well as all Tribal Nations in Minnesota State of Project progress and will send the complete cultural resource report to the Upper Sioux Community.

In addition to the above outreach and responses, Hayward Solar held various meetings with State and local representatives to introduce the Project and review comments and concerns. A summary of the completed meeting notes and upcoming events are included in **Table 30** below. Meetings notes are included in **Appendix A-3**.

Table 29: Summary of Agency Meeting Notes

Date	Outreach Type	Attendees/Contacts	Notes
August 7, 2020	Project Communication partner meeting	Timberly Ross-Tenaska, Laura Cunningham, Mariah Lynne, Abby Flatness, Emily Light - GSC	Introduction to Project and scope of communication needs
August 19, 2020	Hayward Solar Freeborn County	Rachel Wehner – Freeborn County, Mike Roth and Joe Finocchiaro – Tenaska, and	An introductory meeting was held with

Date	Outreach Type	Attendees/Contacts	Notes
	Pre-Application Meeting Agenda	Kathy Bellrichard and Adam Holben – Tetra Tech	Freeborn County to discuss the project, wetlands and waters survey, and Application status. Meeting Agenda Attached.
October 12, 2020	Albert Lea Economic Development Agency (ALEDA) - Virtual Meeting	Phillip Johnson, Director and Laura Cunningham, GSC Project Relationship Manager	Introduction of Utility Scale Solar to ALEDA
October 22, 2020	Project Introduction Meeting with Partner Firms	Tenaska Team – Kyle Gerking, Tenaska Engineering, Michael Roth, Tenaska Development, Joe Finocchiaro, Tenaska Environmental, Ryan Loftus, Tenaska Project Coordination, Timberly Ross, Tenaska Public Relations Arevon Team – Garima Kalra, Arevon Energy Project Management Public Relations Team – Mariah Lynne, Laura Cunningham, Richard Welch, GSC (Community Relations) Legal Team – Jeremy Duehr, Fredrikson & Byron Tetra Tech Environmental Team – Adam Holven and Clara Stahlmann Roeder, Tetra Tech Environmental Westwood Engineering & Permitting Team – Katie Penning, Engineering and Project PM, Mitchell Ott, Engineering, Joe Sedarski and Jake Schaffer, Permitting	Discussion of permitting, roles, and design
November 2, 2020	Project Introduction Call	Kristi Swalve Hantelman, Hayward Solar Project neighbor, Mariah Lynne, and Laura Cunningham- GSC Team	Discussion of solar array, Community Representative role, and grazing potential
November 5, 2020	ALEDA / Greater Jobs Incorporated - Virtual Meeting	Mariah Lynne - Owner GSC, Laura Cunningham, GSC Project Relationship Manager, and Phillip Johnson - ALEDA Director	General Overview of Hayward Solar Project and request for partnership
November 6, 2020	Hayward Solar Project Public Relations Team Meeting	Tenaska Team – Michael Roth, Tenaska Development, Joe Finocchiaro, Tenaska Environmental, Timberly Ross, Tenaska Public Relations Arevon Team – Garima Kalra, Arevon Energy Project Management Public Relations Team – Mariah Lynne, GSC	Discussion of public outreach plan, upcoming meetings, and community discussion

Date	Outreach Type	Attendees/Contacts	Notes
		Fredrikson & Byron – Jeremy Duehr, Esq., Legal Westwood – Joe Sedarski, Permitting	
November 16, 2020	Shell Rock River Watershed District - Hayward Solar Project Introduction	Andy Henschel, Director, Courtney Phillips, Project Manager, and Laura Cunningham, GSC Project Relationship Manager	Informal discussion and explanation of utility-scale solar arrays
November 18, 2020	ALEDA Board - Virtual Meeting	Phillip Johnson - Director, Noelle Hagen - Assistant Administrator, Board members; Tricia Dahl, Mark Heinemann, Bryan Skogheim, Sarah Nelson, Nate Jansen, Richard Murray GSC - Mariah Lynne, Laura Cunningham, Tracy Skaar Tenaska - Mike Roth, Timberly Ross	Project Presentation and request for Economic Impact Study. Meeting Agenda Attached
December 10, 2020	MDA Introductory Meeting	Stephan Roos and Jordyn Bucholtz – MDA, Michael Roth – Tenaska, Sean Sosa - Arevon, Jeremy Duehr - Fredrikson, and Joe Sedarski – Westwood	Meeting notes attached in **Appendix A-3** (with presentation)
December 14, 2020	DOC Introductory Meeting	Louise Mitch, David Birkholz, and Andrew Levi – DOC; Michael Roth – Tenaska; Sean Sosa- Arevon, Jeremy Duehr – Fredrikson; and Joe Sedarski – Westwood	Meeting notes attached in **Appendix A-3** (with presentation)
December 14, 2020	Decision to hire a Community Representative	Tracy Skaar, Hayward resident, Project supporter	N/A
December 14, 2020	Hayward Solar Project Presentation	Phillip Johnson, Tom Jensen - Freeborn County Administrator, Candace Pesch - Freeborn County, Laura Cunningham - GSC, Mariah Lynne - GSC, Tracy Skaar - Community Representative	Slides attached (**Appendix A-3**)
December 18, 2020	Holiday postcard mailing	Project landowners and community stakeholders	List attached (**Appendix A-3**)
December 22, 2020	USFWS and MNDNR Introductory Meeting	Cynthia Warzecha and Joanne Boettcher – MNDNR, Dawn Marsh - USFWS, Michael Roth – Tenaska, Garima Kalra – Arevon; Jeremy Duehr – Fredrikson, Adam Holven and Kathy Bellirichard – Tetra Tech, and Joe Sedarski and Lucas Wandrie – Westwood	Meeting notes attached in **Appendix A-3**
January 2021	Project website created	www.haywardsolarproject.com	N/A
January 4, 2021	Office availability of Community Representative	Tracy Skaar- Hayward resident, Project neighbor, farmer, firefighter, community advocate - Contact: tracy@haywardsolarproject.com	Office times-pending due to Covid-19 (will be posted online

Date	Outreach Type	Attendees/Contacts	Notes
			and on the office signage)
January 4, 2021	Opening of Local Project Office in Freeborn County	Hayward Solar Project Address: 137 N. Broadway, Albert Lea, MN 56007 Phone: 507-320-3142	Project information available
January 6, 2021	Hayward Township Board Meeting	Hayward Township Board members: Loren Lair (chairperson), Keith Iverson, Mic Skaar, Brad Haugen, Sue Runden, Cindy Haugen, Tracy Skaar- Hayward Solar Project Community Representative, Laura Cunningham - GSC, Mike Roth - Tenaska (via phone), Garima Kalra - Arevon (via phone) and Charlie Kermes - Hayward Township outgoing board member	Meeting notes attached in **Appendix A-3**
January 8, 2021	Tetra Tech call with Freeborn County Commissioner (Hayward District)	Adam Holven - Tetra Tech, Dan Belshan - Freeborn County Commissioner	Discussion on Project Area and a few Project questions (**Appendix A-3**)
January 11, 2021	Hayward Solar Project Presentation	Tetra Tech, Tenaska, Arevon, Westwood, Freeborn County leaders, and GSC	Slides attached (**Appendix A-3**)
January 19, 2021	Freeborn County Commissioners Meeting	Freeborn County Board Members, Freeborn County Administrator, Freeborn County Auditor Treasurer, Freeborn County Attorney, Tracy Skaar- Community Representative, Laura Cunningham - GSC	Meeting notes attached in **Appendix A-3** *Team members attended to listen to budget information
January 22, 2021	Hayward Solar Project Introduction Call	MN Representative Peggy Bennett, District 27A and Laura Cunningham - GSC Project Relationship Manager	Brief discussion on location and solar array development
January 27, 2021	Hayward Solar Projects Promotional Items	250 hats, pens, and T-Shirts to handout as GSC team members and the Community Representative explain and educate the community about the Project. These items promote awareness of the Project and create a positive community image.	Mock-ups attached (**Appendix A-3**)
January 29, 2021	Shell Rock River Watershed Staff Virtual Presentation of Hayward Solar Project	Andy Henschel, District Administrator, Courtney Phillips, District Project Manager, Mike Roth - Tenaska, Garima Kalra - Arevon, Laura Cunningham - GSC Project Relationship Manager, Shane Glinski - GSC Assistant Project Manager	Slides attached - request for letter of support (**Appendix A-3**)
February 2, 2021	Hayward Township Board Meeting	Hayward Board Members, Tracy Skaar - Community Representative	Meeting notes attached in **Appendix A-3**
February 8, 2021	Hayward City Council Meeting	Tracy Skaar - Community Representative to attend Hayward City Council to address the council and introduce the Hayward Solar Project	Meeting notes attached in **Appendix A-3**