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## Ogilvie Substation Solar Project

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## Ogilvie Substation Solar Project

The proposed Solar Project is a 1.88 MWac (2 x 940 kw based on electrical services) photovoltaic solar installation located on a 30-acre parcel on Hwy 23 just west of Hwy 65 (Parcel 02-01495-00) Arthur Township, Mora, Minnesota. The project will consist of several rows of fixed-tilt solar panels oriented east–west and spaced approximately 32 feet apart center to center.

The project has been designed to minimize land disturbance. No grading is required, and ground impacts will be limited to a mostly north–south electrical trench approximately 3 feet deep and 2 feet wide, which will connect the panel rows to centrally located electrical equipment. The solar racking will be supported by driven piles, which do not require soil excavation and have no ground disturbance impact. No internal access roads will be constructed, and the site will have access through an easement along the newly built access drive on the parcel to the west. The existing grass hay field where the solar will be constructed will remain intact. Solar panels and racking will avoid the jurisdictional wetlands on the Southern and Eastern sides of the parcel.

The project is expected to operate for 30 to 40 years and will be supported by a 25-year Power Purchase Agreement with East Central Energy (ECE). The facility is designed to serve a portion of the current daytime load at the Ogilvie Substation. We have the support of East Central Energy.

The ground coverage ratio of solar panels to the parcel is less than 9%. The remainder of the site will be left in its current state. Vegetation will be managed through rotational grazing or mowing to maintain a healthy grass cover.

The project is being developed by Shawn Markham, founder of Soltek, a Minnesota-based renewable energy developer and contractor, in partnership with Paul Kreidemacher, founder of MinnSolar, a Minnesota-based distributed generation solar contractor. Together, the development team brings more than 20 years of experience in renewable energy development and construction. Soltek and MinnSolar have an established working relationship with East Central Energy and have completed six projects together over the past approximately five years, including the Osprey Wilds Solar Project, which now supplies 100% of the energy needs at the Osprey Wilds Sandstone campus.

We look forward to working collaboratively with Arthur Township and area residents to bring this project forward. Our goal is to provide clean, locally generated renewable energy while maintaining strong land stewardship and preserving the natural character of the site.

### **Compatibility with the Comprehensive Plan and other Arthur Township Ordinances.**

On April 8<sup>th</sup>, 2024, Arthur Township adopted The Arthur Township Solar Ordinance, section 35 of the Arthur Township Zoning Ordinance. The proposed project has been designed in accordance with and shall meet the requirements of Arthur Township Zoning and the Solar Ordinance.

As stated in the summary, the project will not change the underlying use, vegetation, drainage, grading, or other physical attributes of the underlying parcel land and topography. The only civil work on the project will be the trenching for the electrical wires, keeping all electrical either on the solar racking, the electrical equipment, or underground.

Multiple map and drawing pages have been included in the application showing the dimensions, land use, structure height, access points, and wetland avoidance.

### **Impact Statements:**

Fire Protection Plan – the project will consist of standard electrical service equipment, Solar Edge inverters and optimizers, solar panels, and steel racking. Solar Edge Inverters and Optimizers are NFPA 70 rated and the number one choice for inverters on residential and commercial installation due to its architecture which quickly reduces the current in the DC electrical wires when AC power is lost or there is an electrical fault. The fact that the DC current is quickly reduced, but eliminates arcing and electrical fires common on 1000 and 1500 Volt DC systems without Solar Edge Technology. The modules themselves are comprised of aluminum and glass. Care will be taken during the growing season to keep tall grass away from the electrical equipment and each fall, areas adjacent to the electrical equipment and along the panels will be mowed to reduce and tall dead grass.

Sign Plan – there will be no signage on the project as it is not a place of business or commerce and will not be occupied.

Sound Source Control Plan – post construction, the project will have no full-time staffing, it is not a place of business or commerce so there will be limited to no traffic. The solar inverters have a max decibel rating of 60-67 dB(A), like background noise in an office or home appliances such as a dishwasher.

Lighting Plan – there will be no lighting on the project as it is not a place of business or commerce and will not be occupied.

Hours of Operation – post construction there will be no hours of operation as it is not a place of business or commerce and will not be occupied other than periodic maintenance.

Estimated Traffic – post construction there will be no traffic as it is not a place of business or commerce and will not be occupied other than periodic maintenance.

Number of Employees – post construction there will be no employees.

Demand on Utility Services – there will be no demand on the utility services. The project will produce clean renewable energy for the community, not consume it.

**List of Adjacent Property Owners / 10 Properties closest**

First Seller	First	Last	Address	City	State	Zip
Robert	Sharon	Steffen	1019 Imperial Street	Ogilvie	MN	56358
<b>Neighboring Properties</b>						
Gregory	Tami	Fosmark	1986 Hwy 23	Mora	MN	55051
Andrew	Megan	Felland	1723 Mahogany St	Mora	MN	55051
Shawn	Lindsey	McGrew	1964 Hwy 23	Mora	MN	55051
Mary		Poelman	1972 Hwy 23	Mora	MN	55051
Amanda		Nelson	1973 Hwy 23	Mora	MN	55051
Kathryn		Nelson	1967 Hwy 23	Mora	MN	55051
Donald		Servin	205 121 Ave NW	Minneapolis	MN	55448
Robert		Davidson	13290 Otchipwe Ave	Stillwater	MN	55082
Theodore	Linda	Maher	2018 Highway 23	Mora	MN	55051
Jycenta		Nielsen	2022 Highway 23	Mora	MN	55051
Donald		Sauve	2026 Hwy 23	Mora	MN	55051
Gregory		Rowley	2028 Hwy 23	Mora	MN	55051
James	Bonnie	Greski	2032 Hwy 23	Mora	MN	55051
William		Dahlberg	2016 Kingston Trl	Mora	MN	55051
Kyle		Sweningson	2020 Kingston Trl	Mora	MN	55051
Daniel		Rowland	2024 Kingston Trl	Mora	MN	55051
Ron		Kadlec	2030 Kingston Trl	Mora	MN	55051
RHTC			2031 Rowland Road	Mora	MN	55051

### **Interconnection Agreement**

The project has preliminary approval from East Central Energy; however an interconnection agreement is not available. Under the DER system (the process for connecting a generation project to the grid at this scale) the Interconnection Agreement is not completed and signed until further along in the process, after the project has officially moved forward and the interconnection request is made.

East Central Energy will plow the new service electrical cables to each of the two electrical services planned for the project site.

### **Visual Impact Analysis**

The project will have limited visual impacts based on its location and its surroundings. There is no grading, land use, or vegetation changes planned for the parcel. The project will be set back from Hwy 23 more than 500 feet (approximately 540 feet planned).

The West, North, and East views from the project consist of existing trees and wetlands which will not be removed or altered during construction or operation. Below is the view of the parcel looking North, showing existing vegetation on the 3 of the 4 sides of the projects, and the setback from the road.



Racking and module height will be limited to 11 feet or 132” above existing grade further limiting any visual impact. The panels themselves will be fenced in with a common field fence, 5’ of woven wire attached to driven wood posts.

## **Stormwater Management**

The proposed project will have no civil work, as the foundations are driven piles which do not disturb the ground. Access to the site will be through an existing gravel driveway via a permanent easement when the land sale closes (prior to construction). The only earth disturbance will be the excavation and backfill of a single electrical trench that will connect each of the rows of solar panels to the two electrical services.

Since there is no major civil work planned for the project, the underlying vegetation is remaining, the existing drainage is not being modified, and the overall ground coverage is less than 9% with 20 plus feet of vegetated surface between each row, there will be no concentrated or turbid water requiring stormwater management.

## **Screening and Buffering**

The project is proposed for a land parcel that has existing tree vegetation on the East, North, and West sides creating a natural screen and buffer for the project. The South end of the project which faces Highway 23 will be set back from the road a minimum of 500 feet. The land between the array and the road is an existing wetland buffer which is not being disturbed. With the first panels a minimum of 500 feet from the road, and looking across the wetland, it is reasonable that no additional screening is needed between the project and the road as well. Below is a photo of the proposed site in the summer. The solar will only be in the darker green areas of the field (currently a hay field).



## **Maintenance**

The project will employ fixed tilt racking which requires no maintenance as there are no moving parts. The system itself will only require maintenance when an inverter faults out. This may require trouble shooting or replacement.

Site or vegetation maintenance will be accomplished through grazing with sheep or mechanical mowing of the existing vegetation. Regardless of method, vegetation inside the fence and roughly 12 feet outside of the fenced project will be maintained so that it generally does not exceed 18 inches in height. It is anticipated that the site will need to be mowed 3 times per year if it is not grazed. If it is grazed during the growing season, it will be mechanically mowed each fall at the end of the growing season. Invasive weed species will be controlled through the mowing process or removed separately as needed.

### **Historical and Cultural Impact Avoidance**

The project is being constructed on an existing farm field (currently hay production). The underlying use of the ground will not be changed from the installation of the solar project. There will be no grading or land disturbance outside of the single electrical trench and the installation of the driven pile foundations and fence posts. Since the project is being constructed and operated in this way, there will be no historical or cultural disturbance as typically defined when demolition or grading were to occur.

## Environmental Impact

The solar project would not be environmentally detrimental to the public health, safety, and welfare of the neighborhood and community. The project will be constructed with steel and aluminum fixed tilt racking, free of any petrochemicals or other liquids which may be released over time due to wear or tear. The fixed tilt racking and solar will have no moving parts and require no maintenance other than occasional repair or replacement of inverters due to warranty failures. The inverters are electrical components which contain no hazardous materials or fluids. The only electrical components on site which will contain fluids or oil will be the transformers provided by the electrical utility, which will be of similar construction to any 3 phase service transformer at any residential or commercial place of business in Pokegama Township.

The project will utilize Crystalline silicon solar modules are non-toxic, chemically stable, and environmentally safe throughout their lifecycle. They are made mostly of glass, aluminum, and silicon, contain no hazardous substances in usable form, and are safely installed in millions of locations worldwide—including residential neighborhoods and agricultural land.

Why Crystalline Silicon PV Modules Are Non-Toxic and Safe - Crystalline silicon photovoltaic (PV) modules are made primarily from materials that are abundant, stable, and non-toxic. They do not contain hazardous liquids, gases, or radioactive materials, and they pose no risk during normal operation.

1. Core Materials Are Benign - A typical crystalline silicon solar panel is composed of:
  - Glass (≈70–75%) – the same type used in windows
  - Aluminum frame – widely used in construction and food packaging
  - Silicon cells – refined sand (silica), the second most abundant element in the Earth's crust
  - Encapsulant (EVA or similar polymer) – an inert plastic used in medical and food applications
  - Backsheet (polymer) – stable and non-reactiveNone of these materials are classified as toxic or hazardous under U.S. EPA or OSHA regulations.
2. No Hazardous Substances in Normal Use
  - Crystalline silicon panels do not contain cadmium, lead-based solder in meaningful quantities, mercury, or arsenic compounds in forms that are mobile or bioavailable.

- Any trace elements used in manufacturing are fully encapsulated between layers of glass and polymer, preventing exposure to people, soil, or groundwater.
  - Panels are solid-state devices—no fluids, fumes, or emissions are released during operation.
3. Chemically Stable and Non-Leaching
- Panels are designed to withstand decades of outdoor exposure (hail, rain, snow, heat).
  - Independent testing (e.g., TCLP leachate tests) shows crystalline silicon modules do not leach contaminants into soil or water—even if damaged.
  - Because of this stability, panels are often classified as non-hazardous solid waste at end of life.
4. Safe in Fire or Weather Events
- In fires, crystalline silicon panels behave similarly to laminated safety glass.
  - They do not explode, aerosolize toxins, or release dangerous smoke beyond what is typical of common construction materials.
  - Emergency responder guidance from fire agencies confirms no special hazmat procedures are required.
5. Widely Approved and Regulated - Crystalline silicon PV modules are:
- Certified under UL, IEC, and IEEE safety standards
  - Approved for installation on homes, schools, hospitals, farms, and commercial buildings
  - Deployed globally for over 40 years with no evidence of public health impacts
6. End-of-Life and Recycling
- Panels are recyclable, with glass and aluminum recovery rates exceeding 90%.
  - Recycling programs further reduce any potential environmental impact and keep materials out of landfills.

Photovoltaic (PV) solar energy is not environmentally detrimental; rather, it provides clear and measurable environmental benefits compared to conventional energy generation. PV systems generate electricity directly from sunlight without combustion, extraction, or ongoing resource consumption. Once installed, solar panels operate silently and emission-free, producing power without releasing air pollutants, greenhouse gases, or toxic byproducts into the environment.

One of the most significant environmental advantages of PV solar is its minimal water usage. Traditional power generation methods—such as coal, natural gas, nuclear, and even some bioenergy facilities—require large volumes of water for fuel processing, cooling, and steam generation. In contrast, PV solar requires no water for electricity production, except for

occasional panel cleaning. This dramatically reduces strain on local water resources, protects aquifers and surface waters, and is especially beneficial in regions experiencing water scarcity or drought.

PV solar also eliminates the need for fossil fuel extraction, transportation, and combustion, all of which carry environmental risks. Fossil fuel–based energy generation is associated with air pollutants such as sulfur dioxide, nitrogen oxides, particulate matter, and mercury, which contribute to smog, acid rain, respiratory illness, and ecosystem damage. Solar generation avoids these pollutants entirely, improving air quality and reducing public health impacts while also lowering carbon dioxide emissions that drive climate change.

Additionally, PV solar facilities have a relatively small and reversible environmental footprint. Solar panels are mounted above ground, do not require mining or drilling during operation, and can coexist with agriculture, grazing, and pollinator habitat. At the end of a project’s life, the land can be restored, and the panels themselves are recyclable, with glass and aluminum recovery rates exceeding 90 percent. This makes PV solar a sustainable, long-term energy solution that aligns with environmental stewardship and responsible land use.

PV solar energy provides clean, reliable electricity while conserving water, eliminating fuel-related pollution, and reducing greenhouse gas emissions. Compared to conventional energy sources, it represents a clear environmental improvement and a practical pathway toward a cleaner, more resilient energy system.

# Ogilvie Substation Solar Decommissioning Plan

## 1. Project Overview

**Project Name:** Ogilvie Substation Solar

**Project Size:** 2 x 940 kW (AC) Solar Photovoltaic Facility

**Location:** Arthur Township, Minnesota (Kanabec County)

**Estimated Project Life:** 30–40 years from commercial operation date

This Solar Decommissioning Plan has been prepared to outline the procedures, responsibilities, and estimated costs associated with the decommissioning and site restoration of the above solar project at the end of its useful life or upon early termination of operations.

## 2. Purpose of the Decommissioning Plan

The purpose of this plan is to:

- Ensure the orderly removal of all solar energy system components
- Restore the project site to a condition reasonably similar to its pre-project state
- Protect public safety and the environment

## 3. Triggering Events for Decommissioning

Decommissioning of the facility shall occur upon the earliest of the following:

1. End of the project's useful life (anticipated 30–40 years)
2. Permanent cessation of electricity generation
3. Abandonment or non-operation of the facility for a continuous period of 12 months

Decommissioning activities shall commence within **12 months** of a triggering event unless otherwise approved by the local authority.

## 4. Decommissioning Activities

### 4.1 Solar Equipment Removal

The following equipment shall be removed from the site:

- Solar photovoltaic modules
- Racking and mounting systems

- Inverters, transformers, and electrical equipment
- DC and AC wiring
- Fencing, gates, signage, and security systems

All removed materials shall be reused, recycled, or disposed of in accordance with applicable federal, state, and local regulations.

#### **4.2 Foundations and Subsurface Components**

- Driven piles or foundations shall be removed to a minimum depth of 30 inches below grade.
- Underground electrical infrastructure shall be removed to a minimum depth of 30 inches.

#### **4.3 Site Restoration**

Areas disturbed during restoration shall be seeded with a native seed mix or the applicable crop or cover crop post decommissioning.

### **5. Estimated Decommissioning Costs**

The estimated cost to decommission each 940 kW solar facility is summarized below:

<b>Activity</b>	<b>Estimated Cost</b>
Solar equipment removal	\$12,000
Foundation and pile removal	\$10,000
Electrical removal	\$3,000
<b>Subtotal Decommissioning Cost</b>	<b>\$25,000</b>

### **6. Financial Assurance**

The project owner shall provide a Cash Escrow account equal to 125% of the decommissioning costs. The escrow account shall be funded within the first 5 years of the project’s operating life.

## **7. Responsible Party**

The project owner or its successor shall be responsible for completing all decommissioning activities and bearing all associated costs.

If the project owner fails to complete decommissioning in accordance with this plan, the local authority may draw upon the financial assurance to complete the work.

## **8. Certification**

I certify that the information contained in this Solar Decommissioning Plan is true and accurate to the best of my knowledge and that the project will be decommissioned in accordance with this plan and applicable laws.

Project Owner: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_