Oshkosh Solar Project Engineering Plan

Winnebago County, WI
PSCW Docket No. 6680-CE-193

Stantec

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Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
AC (MW_{AC})	Alternating current
ATC	American Transmission Company
CPCN	Certificate of Public Convenience and Necessity
DC (MW_{DC})	Direct current
DPP	Definitive Planning Phase
GIA	Generation Interconnection Agreement
kV	Kilovolt
MISO	Midcontinent Independent System Operator
MW	Megawatt
O&M	Operations and Maintenance
POI	Point of Interconnection
PSCW	Public Service Commission of Wisconsin
PV	Photovoltaic
ROW	Right-of-way
V	Volt
WDNR	Wisconsin Department of Natural Resources
WPL	Wisconsin Power & Light Company

1 Introduction

Wisconsin Power & Light Company (WPL), a subsidiary of Alliant Energy (Alliant), is preparing an application for a Certificate of Public Convenience and Necessity (CPCN) for submission to the Public Service Commission of Wisconsin (PSCW) to construct and place in utility service the Oshkosh Solar Project (Project), a 123 megawatt (MW) alternating current (AC; MW_{AC}) solar generation facility. The Project's PSCW docket number is 6680-CE-193.

Consistent with Wis. Admin. Code section PSC 111.51(2), WPL has notified and conferred with members of the Wisconsin Department of Natural Resources (WDNR) and the Public Service Commission of Wisconsin (PSCW) of its intention to file a CPCN for the Project. In accordance with Wis. Stat. § 196.491(3)(a)3.a, WPL is submitting this Engineering Plan (Plan) to the Wisconsin Department of Natural Resources (WDNR) at least 60 days prior to the intended submission of the corresponding CPCN application to the PSCW. WPL requests that within 30 days following receipt of this Plan, the WDNR provide a list of all WDNR permits or approvals that appear to be required based on the information contained within the Plan.

The figures and information contained in this Plan are estimates based on various desktop and field analyses performed to date. Details regarding the Project design are subject to change dependent on final selected equipment or siting of the solar arrays and associated facilities.

2 Project Overview

2.1 Project Location

The Project will be a ground-mounted photovoltaic (PV) solar energy generation facility in Winnebago County, Wisconsin with facilities located on approximately 1,451 acres of land within the City of Oshkosh and the Towns of Algoma, Omro, Nekimi, and Utica. The Project is located between Clay Road to the east, 9th Street Road to the north, Elo Road to the west, and Fisk Road to the South.

The nameplate or gross inverter capacity of the Project will be approximately 172.95 MW_{DC} or 148.37 MW_{AC}. The Project will have a net output of 123 MW_{AC} at the point of interconnection (POI).

Table 1. Project Location by County, Town, Township, Range, and Section(s).

			Primary Project Area			Alternate Project Area		
County	**Type**	**Name**	**Township**	**Range**	**Section(s)**	**Township**	**Range**	**Section(s)**
Winnebago	City	Oshkosh	18N	16E	31	18N	16E	31
	Town	Algoma	18N	16E	30, 31	18N	16E	30, 31
	Town	Nekimi	17N	16E	5, 6, 8	17N	16E	6
	Town	Omro	18N	15E	25, 35, 36	18N	15E	25, 35, 36
	Town	Utica	17N	15E	1, 2	17N	15E	1,2,3

2.2 Project Maps

The following project maps are included in this submission to provide an overview of the Project Area in the context of the surrounding environment (Appendix A):

- Figure 1. Project Location and Aerial Photography
- Figure 2. Project Location and Topography
- Figure 3. Wetlands and Waterways
- Figure 4. Land Cover

3 Panels

The Project will include the installation of an east-west tracking solar panel system. The Project land under control is sufficient to produce the desired POI capacity of 123 MW_{AC} in Primary Array Areas and an additional capacity of at least 25% (30.75 MW_{AC}) in Alternate Array Areas, as required by the PSCW.

In recognition of ongoing technological improvements, the make and model of the solar panels are being finalized but the current anticipated rated power is expected to be 705 Watts (W) per panel. The bi-facial panels will measure approximately 8 feet long by approximately 4 feet wide. The solar panels are anticipated to be mounted on a galvanized steel and/or aluminum rack system. The rack system will be a +/- 60-degree range of motion (single axis) tracker positioned in the north/south direction that will track the sun from east to west, or a system with similar characteristics.

4 Access Roads

The solar panel arrays will require an access road system to allow for construction equipment and ongoing operation and maintenance. Access roads will originate at a public road and extend into Array Areas as necessary to provide access to panels, inverters, fencing, and other equipment. Permanent access roads will be approximately 20 feet wide. Access roads will be designed to avoid direct impacts to wetlands and waterways to the greatest extent practicable.

Access points will be selected to provide the most convenient internal circulation patterns while causing the least disruption to existing traffic. Safety at access points will be the most important factor in determining the spacing and location of access points. Access points will be permitted with the appropriate jurisdictional highway agency (e.g. Wisconsin Department of Transportation (WisDOT), Winnebago County Highway Department, and the Towns of Algoma, Nekimi, Omro, and Utica).

5 Collection System

A 1,500-Volt (V) direct current (DC) collection system will connect the individual solar panels to a centrally located inverter for each inverter block. The inverter will convert the DC power to an AC voltage, which will be stepped up by a transformer to 34.5 kV for transport to the Project substation.

The 34.5 kV AC collection system will consist of an underground series of cables connecting inverters in each inverter block to the Project substation. The underground cables will utilize a jacketed neutral design. The cables will be approximately 1.5 to 2.5 inches in diameter, including insulation and concentric neutral. The final installation depth will be approximately 3-4 feet underground in upland areas where open trenching or vibratory plowing will be used for installation. Collection cables will avoid roadways, wetlands, waterways, and other sensitive resources by using sub-surface horizontal directional drilling (HDD) which will bore cables from an upland location, under the wetland or waterway, and back to the surface in a second upland location. The depth of HDD paths will vary. The Project is designed with up to eight collection circuits (six primary and two alternate), which will terminate within the Project substation.

6 Project Substation

The collection system will terminate at the Project substation where the power transmitted will be transformed via a 34.5/138 kV step-up transformer. The Project substation will be located approximately 0.3 miles west of Clairville Road in the Town of Nekimi. The Project substation will be electrically connected to the POI at the Fitzgerald substation, owned and operated by American Transmission Company (ATC), with an approximately 1,000-foot 138 kV generation tie-in line.

7 Interconnection

The Project entered in the Midcontinent Independent System Operator (MISO) Interconnection Queue and was assigned queue position J1745 (Fitzgerald Solar J1745 – 100 MW). The Project was studied in the Definitive Planning Phase (DPP) DPP-2020 cluster and in the East-ATC study group. The Generation Interconnection Agreement (GIA) was executed effective September 2024. A second MISO Queue position was entered and was assigned position J3466 (Fitzgerald Solar J3466 – 100 MW); this position is currently in DPP-2023 cluster and in the East-ATC study group.

All systems required to protect the Project and transmission system equipment will be installed according to the ATC and MISO Interconnection Standards. The details of the interconnection and exact point of demarcation between the Project and ATC facilities will be determined during the MISO interconnection process.

8 O&M Facilities and Staging (Lay Down) Areas

The Project will not include construction of a dedicated O&M building. Single-story metal shop-type structures (conex boxes) will be located on-site for storage purposes. At least one permanent gravel parking lot and staging area will be included in the Project. The specific location of this facility has yet to be determined. The area will be sized adequately for use throughout the Project lifespan.

Temporary staging or laydown areas are planned for the Project. These areas will be internal to the site while the Project is under development. The areas will be sized to adequately stage construction equipment and deliveries and will be utilized during the construction process to accommodate equipment, materials and construction trailers, as well as parking for personnel and construction vehicles. Upon completion of construction, the area will be developed as part of the site plan.

9 Potential Environmental Impacts

Table 2. Potential Environmental Impacts of the Project.

Attribute	Proposed Solar Facility
Will any recreational areas/trails be affected?	No
Will construction activities disturb more than one acre of land?	Yes
Will there be construction in wetlands?	Yes, construction will occur in farmed and wet meadow wetlands where solar panels and fencing are planned for installation. Construction activities in wetlands will be temporary and construction impacts will be minimized through the use of timber matting and appropriate best management practices.
Will there be permanent fill placed in wetlands?	Yes, one permanent access road crossing a wetland is required to access the Project substation facility.
Will temporary bridges over waterways be required for construction?	No
Will any fill, poles, or facilities be placed in waterways below the ordinary high-water mark?	No
Will more than 10,000 square feet of land be graded or removed within 300 feet of a waterway?	To be determined
Will there be any discharge of water from excavations during construction?	Yes
Are any threatened, endangered, or species of special concern or habitats potentially within the Project Area?	Yes

10 List of Needed Permits

Table 3. Anticipated Permits Necessary for the Project

Agency	Permits and Regulatory Approvals	Anticipated Need
PSCW	CPCN	Yes
U.S. Army Corps of Engineers (USACE)	Clean Water Act Section 404 Permit (33 USC § 1344)	To be determined
	Clean Water Act Section 10 Permit (33 USC § 1341)	To be determined
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act Coordination (16 USC §§ 15.36, 15.39)	Yes
Wisconsin Department of Natural Resources (WDNR)	WPDES Pit/Trench De-watering Permit (Wis. Stat. § 283)	Yes[2]
	WPDES Construction Stormwater Permit (Wis. Stat. § 283, Wis. Admin. Code NR §§ 216,151)	Yes
	Wis. Stat. § 30 Waterway Permit	To be determined
	Wetland Water Quality Certification (Wis. Stat. § 281.36, Wis. Admin. Code NR §§ 103,299)	Yes
	State Endangered Resources Review (Wis. Stat. § 29.604, Wis. Admin. Code NR § 27)	Yes
Wisconsin State Historical Society Historic Preservation Office (SHPO)	Archaeological and Cultural Resource Coordination	Yes
	Archaeological and Cultural Resource Request to Disturb Permit (Wis. Stat. §§ 157.70(2r), (4), (5))	To be determined
Wisconsin Department of Transportation (WisDOT)	Oversize-Overweight Vehicle Permit (Wis. § Stat. 348, Wis. Admin. Code Trans § 250)	To be determined
	Connection Permit (Wis. Stat. § 86.07(2)(a), Wis. Admin. Code Trans § 231)	Yes
	Utility Permit (Wis. Stat. § 84.01(31))	Yes
	Railroad Permit (Wis. Stat. § 85.08 and Wis. Admin. Code. Trans § 29)	Yes

[2] De-watering activities will be covered under the General WPDES Construction Stormwater Permit acquired through NR 216 and NR 151.

11 Permitting and Construction Schedule

Milestone	Anticipated Date
Submit CPCN application	Q1 2027
Receive required permits and regulatory approvals	Q1 2028
Start of construction	Q2 2028
In-service date	Q4 2029

Appendix A Map Figures

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