**ENVIRONMENTAL ASSESSMENT**

**Grant County Solar Electric Generation Facility**

**Grant County Solar, LLC (a subsidiary of NextEra Energy Resources, LLC)**

**Docket 9804-CE-100**

Application for Grant County Solar, LLC to Construct a New Solar Electric Generation Facility located near Potosi and Harrison townships, in Grant County, Wisconsin.

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# 1. Introduction

On May 7, 2020, Grant County Solar, LLC (GCS), a wholly-owned indirect subsidiary of NextEra Energy Resources LLC filed an application with the of Public Service Commission of Wisconsin (Commission) to receive a Certificate of Public Convenience and Necessity (CPCN) for the authority to construct a solar electric generation facility (docket 9804-CE-100)[[1]](#footnote-1). The solar facility would have a nameplate capacity of 200 megawatts (MW). GCS’s request to receive a CPCN was filed with the Commission pursuant to Wis. Stat § 196.491(3) and Wis. Admin. Code § PSC 111.53. The application for the generating facility was determined to be complete on June 4, 2020[[2]](#footnote-2). GCS sent copies of the complete applications to the clerk of each municipality in which the project might be located and to the libraries in the wider project region by U.S. mail on June 9, 2020.

The GCS generation facility (also referred to as ‘the project’) would be a 200 MW alternating current (AC) photovoltaic (PV) electric generation site. The proposed project would be made up of separately fenced arrays, and approximately 1,403 acres would ultimately be used to reach the 200 MW capacity. Underground collector circuits would go from the arrays to a new collector substation. A 200-foot 138 kilovolt (kV) generator tie line would take the electricity to a new switchyard, where it would interconnect to the existing electric grid. The new switchyard would be constructed and owned by American Transmission Company (ATC). The generator tie line is less than one mile in length, and therefore does not require a separate CPCN. The land needed for the project would be leased from landowners. GCS would develop, design, permit, and construct the generation facility, and sell it to Wisconsin Power and Light Company (WP&L).

WP&L currently has an application for a Certificate of Authority to purchase this project, along with other solar developments, in docket 6680-CE-182.

## 1.1 Analysis for Wisconsin Environmental Policy Act Compliance

The solar electric generation facility is a Type III action under Wis. Admin. Code § PSC 4.10(3). Type III actions normally do not require preparation of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) under Wis. Admin. Code § PSC 4.10(3). However, an evaluation of a specific Type III proposal may indicate that the preparation of an EA is warranted for that proposal. The Commission is preparing this EA to evaluate the location of the project and its potential environmental and community impacts. When the EA is complete a preliminary determination will be made on whether to undertake a full EIS and considered before a final determination is made. At the time of the preliminary determination, the Commission shall make copies of the EA available to those persons that request it.

An EIS is required if an EA determines there are significant impacts to the environment as a result of the project. The EA is a written review of the potential impacts of the proposed project that would affect the quality of the human environment as described in Wis. Stat. § 1.11(2)(c). The EA also describes ways of mitigating or avoiding some of the expected impacts and concludes with the evaluation of ten items described in Wis. Admin. Code § PSC 4.10(2)(d).

Notification[[3]](#footnote-3) of the Commission’s intent to prepare an EA, including a solicitation for comments on the environmental aspects of this proposed project, was sent to the WEPA mailing list for this docket on June 25, 2020. The WEPA mailing list includes:

* Local residents and landowners potentially affected by the project;
* Municipal officials in the towns and counties covered by the project area;
* Local news media;
* Libraries in the project area;
* Senators and legislators representing the affected area, and;
* Any other persons with a demonstrated interest in the proposed project.

Through the EA scoping period, Commission staff solicit public comments about the proposed project, and take any comments or concerns regarding the environmental assessment or review of the project into consideration during the analysis of the project. The comments received are discussed further in Section 1.4.2 of this EA.

## 1.2 Environmental Assessment Scope

The Commission’s Division of Digital Access, Consumer, and Environmental Affairs prepared this EA in cooperation with the Department of Natural Resources (DNR) Office of Energy to determine if an EIS is necessary under Wis. Stat. § 1.11. A preliminary determination was made on October 27, 2020, concluding that preparation of an EIS was not necessary. This preliminary determination has a comment period ending November 16, 2020.

This EA is being submitted as an exhibit in the technical hearing on the proposed project. The scope of the EA is to review and describe the expected or potential impacts the construction and operation of the proposed project would have on the environment. This includes impacts to the local residents and community as well as natural resources. The EA also addresses potential ways impacts could be avoided or mitigated. The analysis in the EA is provided to the public, intervenors, and the Commissioners to inform comments and decisions regarding the proposed project.

## 1.3 CPCN Hearing and Intervenors

The Commission issued a Notice of Proceeding for the docket July 16, 2020,[[4]](#footnote-4) indicating that a hearing would be held on the proposed project. The Commission will issue a Notice of Hearing for this project with details on the public and technical hearings. The technical hearing for parties to the proceeding will be held on February 10, 2020. The public hearing on the project is scheduled to be held on February 11, 2021. Due to the COVID-19 pandemic, recent hearings have been held over an internet web meeting platform, with the ability for the public to call in via telephone.

The following entities requested to intervene in the dockets and were accepted:

* RENEW Wisconsin (RENEW)
* Grant County Intervenors
* American Transmission Company (ATC)
* Langmeier

## 1.4 Persons Contacted, Comments, and Permit Compliance

Wisconsin Admin. Code § PSC 4.20(2)(f) states that the EA shall include a list of other persons contacted and a summary of comments or other information received from them, including information regarding whether the proposed project complies with the regulations of other governmental units.

### 1.4.1 Persons Contacted

No other persons besides staff at DNR and the Commission were contacted or involved in the preparation of this EA.

### 1.4.2 Public Comments

Several comments were received regarding potential impacts of the proposed project. Some concerns addressed across the comment pool are discussed in detail in other sections of this Environmental Assessment. To meet requirements of WEPA and address concerns brought up in public comments, Commission staff has compiled and summarized information on issues such as perceived project size discrepancies, alternative sites, solar panel source and specifications, decommissioning plans including site remediation and facility material disposal, heat island effect, increased storm water runoff, damage resulting from extreme weather events, chemical contamination of storm water runoff and groundwater, aesthetics, setbacks and screening vegetation, property values, energy rates, prime farmland, land use change, forests, wildlife, avian species and lake effect, vegetation management, soil impacts, snow drifting and removal, electric and magnetic fields, noise, glare and glint, federal and state conservation efforts, purchase v. lease of land, substance of effects easements, safety hazards and coordination with local first responders, and construction impacts.

Some commenters expressed support for the project for environmental or economic reasons such as solar facilities providing a source of clean energy generated in-state.

### 1.4.3 Permit Compliance

GCS submitted an application to the Commission for a CPCN, as required by Wis. Stat. § 196.491, for proposed electric generation facilities of 100 MW or more. The Commission will decide whether to approve, deny or modify the project.

The Commission must make a number of determinations regarding construction projects in a short timeframe, without knowing whether other regulatory permits will be issued. The Commission typically includes language in an order authorizing a project that states an applicant is required to obtain all necessary federal, state, and local permits prior to starting construction as a practical way of mitigating that uncertainty. The reason for this requirement is to ensure the Commission does not approve, and the applicant does not begin work on, a project that would not be able to obtain permits from other regulatory agencies, or begin construction in an area without following possible mitigation or construction requirements that are required by another regulatory agency permit.

Table 1.8.1 of the application provides information on potential regulatory permits and requirements, with a regulatory point of contact, description of what triggers the permit, potential filing date and status. The following table lists some of the permits, approvals, and standards that are potentially necessary for the proposed project:

Table 1 Regulatory Requirements

|  |  |  |
| --- | --- | --- |
| **Approval/Requirement** | **Agency** | **Process** |
| Section 404 of Clean Water Act | U.S. Army Corps of Engineers | Applicant states that this permit is not required for the project as they expect to avoid all waters of the U.S. |
| Endangered Species Act, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act | U.S. Fish and Wildlife Service | Information for Planning and Consultation -Completed and is included in Appendix N[1] of the application. |
| CPCN for construction of large generation facility | Public Service Commission of Wisconsin | Pending Commission decision |
| DT1504 and DT1553 Permits | Wisconsin Department of Transportation | Permits are required to construct a new connection to a state highway as well as a permit to construct, operate and maintain utility facilities in highway ROW. |
| MV2604 or MV2612 Permits | Wisconsin Department of Transportation | Some items may require vehicle and road use permits during delivery due to weight or size. |
| Wetland or Waterway General Permits | Wisconsin Department of Natural Resources | Applicant states that none of these permits are required as the project is expected to avoid all wetlands and waterways. |
| Wisconsin Pollutant Discharge Elimination System (WPDES) Construction Site Storm Water Runoff General Permit | Wisconsin Department of Natural Resources | Storm Water Management Plan, Erosion Control Plan, and Water Resources Application for Project Permit are needed. |
| Pit/Trench Dewatering General Permit | Wisconsin Department of Natural Resources | Permit is required for pit/trench dewatering associated with the project. |
| State Endangered Resources Review | Wisconsin Department of Natural Resources | Review of Natural Heritage Inventory database and project area. Identification of any species or habitat records and actions to avoid impacts. |
| Private Well Notification Number | Wisconsin Department of Natural Resources | Permit is required if a new well is deemed necessary as part of the O&M building. |
| Cultural and Archaeological Resources Review under Wis. Stat. § 44.40 | Wisconsin Historical Society | Cultural report submitted to Commission. The Commission is determining compliance with WHS. Expected to avaoid all cultural and archaeological resources. |
| Shoreland Zoning Permit | Grant County Department of Conservation, Sanitation, and Zoning | Permit necessary for earth movement or grading activities in shoreland areas. |
| **Approval/Requirement** | **Agency** | **Process** |
| Utility Permit, Driveway Permit, Permit for Transportation of Loads of Excessive Size and/or Weight | Grant County Highway Department | Permit necessary to construct of maintain any utility crossings for a utility facility. |
| Agricultural Impacts Statement | Wisconsin Department of Agriculture, Trade and Consumer Protection | Report not required as all land included in the project is acquired voluntarily. |
| Road Use Agreement, Oversize-Overweight Permit | Town of Potosi | Permit required for any new building construction. |

County and local governments have numerous responsibilities that can be addressed during the Commission’s CPCN project review. GCS has discussed the project and maintains regular contact with representatives at the Town of Potosi and Grant County Conservation, Sanitation and Zoning Department. Grant County’s planning and zoning land use permits would not be required because the project is going through the state CPCN process. Shoreland and floodplain zoning regulation is retained by Grant County. Potential effects on a local government jurisdiction would be considered by the Commission as an impact on the existing local social environment. Appendix Q of the application contains a record of correspondence and reviews with agencies and local governments.

# 2. Project Overview

In accordance with Wis. Admin. Code § PSC 4.20(2)(b), the EA includes an overview of the design of the facilities to be constructed, the construction process, and the project area.

## 2.1 Purpose and Need

Wisconsin Admin. Code § PSC 4.20(2)(a) directs the EA to describe the purpose and need for the proposed project. Under Wis. Stat. § 196.491(3)(d)2, the project is a wholesale merchant plant and is therefore exempt from the needs analysis that would be required of a state public utility. The applicant did not provide an estimated total cost for the new solar generation facility because that requirement is only applicable to public utility sponsored projects.

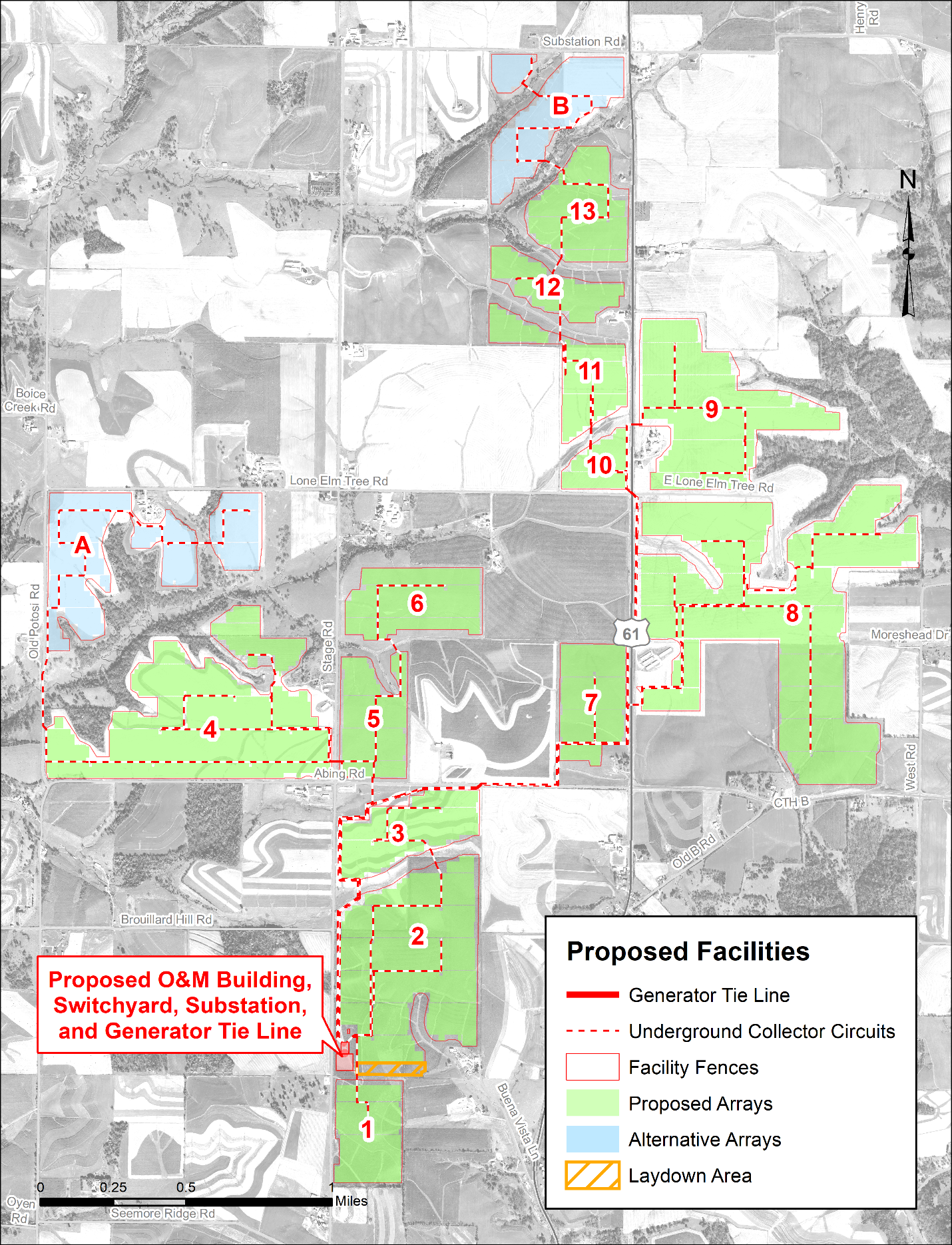
The Commission’s review of CPCN applications for wholesale merchant plants is more limited than for projects proposed by public or investor-owned utilities. Under Wis. Stat. § 196.491(3)(d)2 and 3, a wholesale merchant plant CPCN need not demonstrate that its facility would meet the reasonable needs of the public for electricity, and the Commission may not consider economic factors when evaluating the application. The Energy Priorities Law[[5]](#footnote-5) ranks energy conservation and efficiency as its highest priority, with noncombustible renewable resources as the second highest priority.

The purpose of this proposed project is to generate utility-scale solar electricity for sale. The applicant anticipates that Wisconsin utilities will own the solar generation project, since many utilities have publicly expressed the need for solar power and have plans to decommission fossil fuel power plants. On May 29, 2020, Wisconsin Power and Light Company (WP&L) submitted an application for a Certificate of Authority to acquire, own, and operate the GCS project under docket number 6680-CE-182[[6]](#footnote-6).

## 2.2 Project Location

The proposed project would be constructed in the Town of Potosi in Grant County. The project area is primarily made up of agricultural fields, around the U.S. Highway (USH) 61/35 corridor, between Substation Road and British Hollow Road. The overall acreage for the proposed project study area is approximately 2,058 acres which includes the 1,607 acres consisting of all of the proposed solar arrays (1,325 acres) with 20-foot fence buffer (78 acres), alternative solar arrays (189 acres) with 20-foot fence buffer (15 acres). The generator tie-line, collector substation, interconnection substation, and operations and maintenance (O&M) building are all located within proposed array footprints. A laydown area, that would be used during construction and remain mowed throughout the life of the generation facility accounts for another 6 acres on the south end of Array 2. Figure 1 on the following page shows the entire project area with proposed and alternative arrays, substation, and generator tie line. The proposed project area is roughly bounded by Old Potosi Road to the west, Substation Road to the north, West Road to the east, and Seemore Road and British Hollow Road to the south. The final footprint of the proposed project would be approximately 1,403 acres to achieve 200 MW AC generation capacity.

Figure 1 Map of Project Area



### 2.2.1 Applicants’ Siting Process

GCS evaluated a range of variables to arrive at the selection of the proposed site facilities. The details of this selection process are in Section 1.4.2 of the application. It describes a three-tiered evaluation; state level, regional level, and project area level. At the state-level, the solar resource was evaluated to determine where a project could be economically feasible. That part of the analysis led to southern Wisconsin being identified as an area of good solar resources based on its latitude and weather conditions.

At the regional level, applicants look for areas with adequate solar resources and sufficient available land that meets engineering and design considerations, such as generally level topography. The region is evaluated for broader environmental compatibility, and a community that supports the project. Market access for the project is also evaluated at this level.

Developers evaluate different points of interconnection to the existing transmission system and look for locations that have existing transmission capacity with existing infrastructure or cost-effective upgrades. Siting a solar PV facility near these points on the transmission system reduces the amount of new infrastructure needed. GCS determined that the area near an existing ATC 138 kV transmission line would be suitable and filed an interconnection request to MISO. After arriving at the project area level analysis, the list of the site variables and characteristics evaluated consists of:

* Existing transmission resources
* Land ownership and usage
* Topography in the project area
* Natural resources and endangered species
* Historic and cultural resources
* Transportation infrastructure and community services
* Municipality and landowner feedback
* Efficiency of construction and conformity to uniform power block

Solar PV generation sites benefit from areas with flat topography and minimal grading requirements. Avoiding areas that would cast shade onto the PV panels is another suitability factor. Large agricultural fields that are not surrounded by forests or tall buildings are often considered preferred sites. Siting reviews also attempt to avoid impacts to natural resources such as wetlands, waterways, rare species, and historic resources to the greatest extent possible. As a developer of a wholesale merchant plant, GCS would not have the ability to use eminent domain to acquire property for the construction of the generation site or associated facilities, so there needs to be local support for the project from landowners in order to obtain parcels that allow for the construction of arrays in efficient layouts.

As the GCS project is a merchant plant, the Commission may not consider economic factors when evaluating its proposal. A meaningful comparison of alternative project locations is not possible without the ability to consider costs and economic factors. As a result, discussion of alternative project sites in this EA, other than the larger project siting process described in this section, focuses primarily on how the Commission may choose among the range of array sites within the GCS project footprint.

### 2.2.2 Brownfield Evaluation

Under Wis. Stat. § 196.491(3)(d)8, the Commission shall consider whether brownfields are used to the extent practicable when evaluating large electric generation facilities. Brownfields, as defined by ch. 283.13(1)(a) are abandoned, idle, or underused industrial or commercial facilities or sites, the redevelopment of which is adversely affected by actual or perceived environmental contamination.

GCS’s application stated the potential use of brownfield sites was evaluated at the regional level. A list of brownfield sites in southern Wisconsin was accessed from the U.S. Environmental Protection Agency (EPA) website. No brownfield locations were identified in Grant County. Therefore, no nearby brownfield sites could be integrated into the project.

### 2.2.3 Minor Siting Flexibility

It is the applicant's obligation to minimize the need for minor siting flexibility by rigorously analyzing its proposed project. The Commission recognizes that detailed engineering is not complete prior to authorization of a project and that minor siting flexibility may be needed to accommodate the final design of the project. Situations may be discovered in the field that were not apparent based on the information available to the applicant in development of the proposed project or to the Commission in making its authorization. Therefore, the Commission typically includes an order condition that allows for minor siting flexibility when authorizing a project.

The minor siting flexibility order condition requires that the applicant consult with Commission staff when proposing a change in siting. If the review determines that the proposed change requires Commission approval, the applicant must request authorization in the form of a letter containing details on the following items:

* Scope of the change
* Reason for the change
* Incremental differences in any environmental impacts
* Communications with potentially affected landowners
* Documentation of discussions with other agencies regarding the change
* Maps of the approved route and the proposed change, including property boundaries and natural features

Minor siting flexibility requests are reviewed by Commission staff. Approval is delegated to the Administrator of the Division of Energy Regulation and Analysis with the advice and consent of the Administrator of the Division of Digital Access, Consumer, and Environmental Affairs.

Proposed changes require reopening of the docket unless the following three criteria are met:

* No new landowners are affected who have not been given notice and hearing opportunity
* Affected landowners have agreed to the change in writing
* No new resources are affected or additional impacts that were not described in the EA

Additional requirements for the applicant following an approved change include:

* Obtaining all necessary permits
* Complying with agreements made with local units of government
* Complying with all landowner agreements
* Avoiding parts of the project area that the Commission finds unacceptable
* Complying with the applicant’s environmental siting criteria

### 2.2.4 Alternative Solar Array Area

A CPCN for a large electric generation facility requires[[7]](#footnote-7) the submittal of “site-related information for each of two proposed power plant sites.” In its review of wind energy electric generation facilities, the Commission interpreted this site alternative requirement would be met if an applicant provided 25 percent additional turbine locations for the Commission to use in its alternatives analysis. This was due to a decision that it would not be practicable to require an entirely separate electric generation facility proposed when the footprint of such a site would be up to tens of thousands of acres. This has been interpreted for solar electric generation facilities to be a requirement for an additional 25 percent of acreage that could be developed.

The applicant provided in its application an additional 25% area for alternative locations of solar arrays as required by Wis. Stat § 196.491 and Wis. Admin. Code § PSC 111. The alternative area is required for two reasons:

* The alternative area may be used to avoid portions of the proposed area that are found undesirable or unusable during the Commission’s review of the application.
* The alternative area may be used to resolve problems that arise during the construction process.

Situations that may prompt the use of alternative areas include, but are not limited to: protecting resources, avoiding unanticipated sub-surface conditions, accommodating governmental requests, addressing landowner concerns, minimizing construction costs, or improving electric generation. Both reasons for utilizing the alternative area are addressed when the Commission authorizes a project in siting decisions and as order conditions.

## 2.3 Project Design

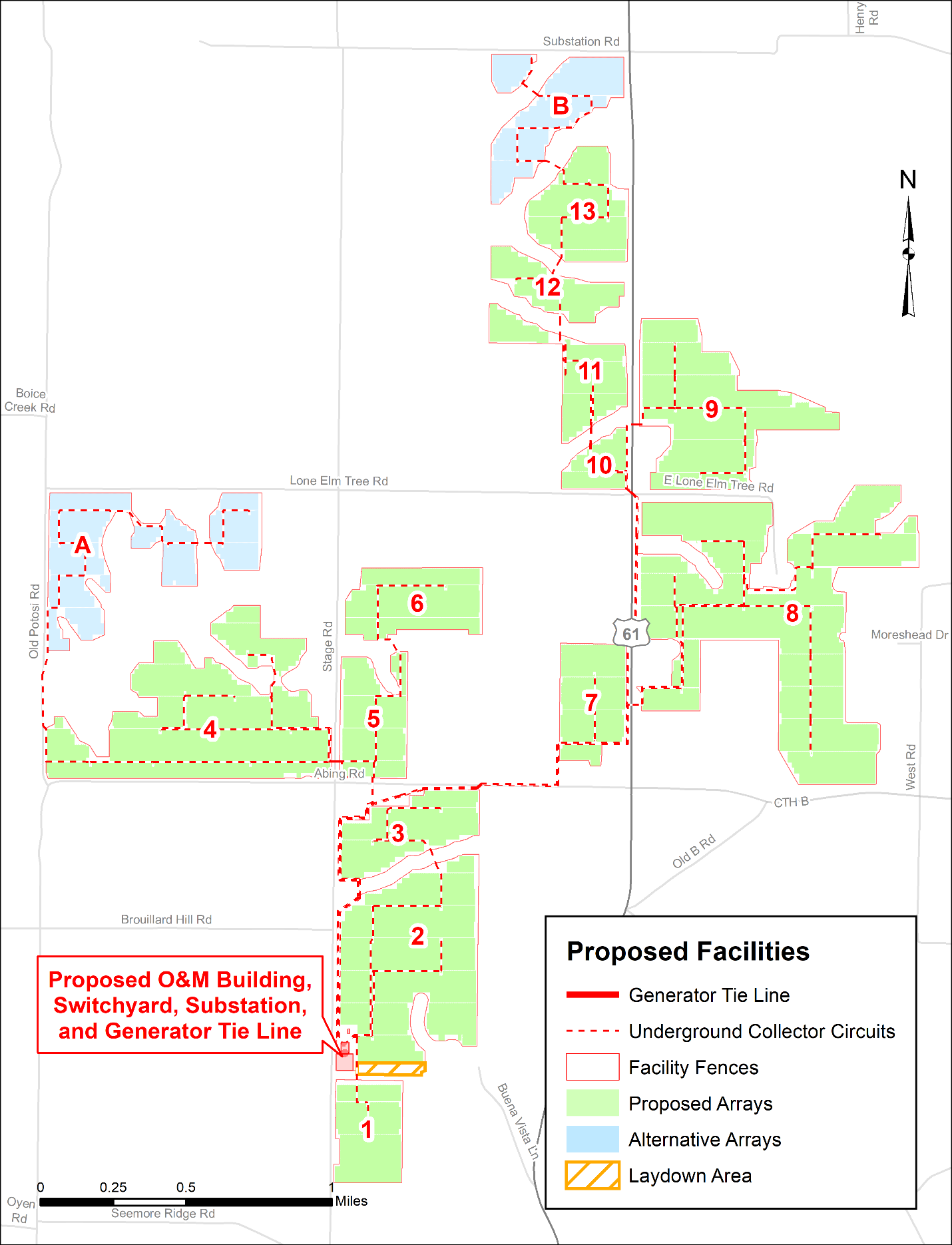
### 2.3.1 Facilities Overview

The solar facility would consist of solar PV panels on a single-axis tracking system. The proposed project would have a generation capacity of up to 300 MW direct current (DC) and interconnect to the electrical grid at 200 MW alternating current (AC). Solar panels would be grouped into 63 arrangements called “power blocks” of a certain size (150-182 panels depending on wattage efficiency). All power blocks would be organized into 15 fenced-in “arrays,” including two alternative array sites. Power blocks within each array would be connected to inverters sized to match the power generated by the power block (approximately 4.8 MWDC). The inverters convert the DC power produced by the solar panels into AC that can go into collector circuits and eventually the transmission system. Single feeder collector circuits would be constructed underground in trenches approximately three to four feet deep and 12 to 18 inches wide. The collector circuits would connect to a collector substation where the voltage would be converted from 34.5 kV to 138 kV. The electricity would then go into the proposed 138 kV generator tie line, which would connect the facility to the existing transmission system.

A 200-foot right-of-way (ROW) would be required for the generator tie line, and would be located completely within the footprints of the collector substation and Tennyson Switchyard, which are located within the footprint of proposed Array 2. GCS has secured the land required for the generator tie line through a long term lease and easement agreement. The details required for the solar generation facility to be operational have been worked out in transmission studies between the Midcontinent Independent System Operator, Inc. (MISO), American Transmission Company (ATC), and the applicant as part of the MISO August 2017 Definitive Planning Phase (DPP) Study Cycle, and are reflected in the executed Generator Interconnection Agreement[[8]](#footnote-8) and Solar Resource Assessment[[9]](#footnote-9).

Approximately 1,607 acres would make up the area affected by the proposed solar arrays, Commission-required alternative solar arrays, electrical collection system, collector substation, operation & maintenance (O&M) building, and access roads.[[10]](#footnote-10) Of that, approximately 1,403 acres would make up the necessary area to host the 200 MWAC solar facility and would be leased by the applicants. A laydown area, that would be used during construction and remain mowed throughout the life of the generating facility accounts for another 6 acres on the south end of Array 2.

Figure 2, Preliminary Layout of Grant County Solar Energy Project



### 2.3.2 PV Arrays

GCS provided information on the two models of Jinko Solar brand[[11]](#footnote-11) mono-crystalline and one model of First Solar brand[[12]](#footnote-12) thin film solar PV panels that are under consideration for this project and states that a decision has not yet been made on which model of panel would be use. None of the panels under consideration are described to use bifacial technology, which would allow the absorption of light from the back side of the panel, as well as the front side. This type of technology would increase the energy production of the solar panels. Panel electric capacities would range from 370 to 450 watt DC per module, with the rectangular panels containing multiple modules and panel sizes ranging from 3.25 to 4.04 feet in the shorter dimension to 6.52 to 6.59 feet in the longer dimension. Depending on the watt rating of the panels, approximately 725,000 to 750,000 panels may be needed for the entire site to generate the proposed 200 MWAC. Currently the project is designed around up to 63 power blocks of approximately 4.8 MW each.

Panels would be installed in a single-axis tracker system arrangement. A power block would involve multiple solar panels strung together, with multiple strings associated with one tracker. The tracking system allows the panels to follow the movement of the sun from 60 degrees east to 60 degrees west during the day, with zero degrees being level to the ground, when the sun is directly overhead. The tracking system is usually constructed out of galvanized or stainless steel or aluminum. The supports would typically be installed by a pile driver. Inverters are also typically installed using driven pier foundations, similar to the supports for the solar panels, although concrete foundations may be used if soil or ground conditions require increased stability. Site sample borings indicated that cobbles appeared in the soil at depths of 8.5 to 14.5 feet, which limits the driven pile depth. If driven pile installation would be used, there would be no excavation of topsoil.

GCS also provided a description of the inverters that would be used for this project. Inverters are devices that take the DC electricity generated by the solar panels and convert it to the AC electricity that is transported through the electrical transmission and distribution system. Inverters would be matched to the size of proposed power blocks to help efficiently deliver the generated electricity to the collector substation. Inverters could produce AC powers ranging from 2 MW to 4 MW, depending on temperature and other conditions at an output AC voltage of 34.5 kV. Permissible input DC voltages are about 1,500 volts for these manufacturers. Physical dimensions would approximately be 22 feet in width, 7 feet in depth, and 7 feet in height.

The number of panels for each inverter would be determined by the final inverter design selected. Large inverters can accommodate the connection of more panels. The current project is designed around approximately 63 power blocks with an estimated range of 150 to 182 single axis trackers assigned to a power block.[[13]](#footnote-13) This design plan could change when final equipment is selected and all engineering is complete. AC collector circuits would run throughout the PV arrays, combining to nine collector circuits that would go to the collector substation. Again, this current design concept is subject to revision as further engineering evaluation is performed on the site.

### 2.3.4 Collector Circuits

Approximately nine collector circuits would run from various power blocks to the collector substation. The applications states that approximately 32 miles of collector circuits would be used for the project. These collector circuits would be installed underground, and the voltage would be 34.5 kV. The application states that these collector circuits would be buried in a trench four feet deep and varying width depending on the number of buried circuits in the trench, while maintaining a six foot spacing. The collector substation would transform the electric voltage from 34.5 kV on these collector circuits to the interconnection voltage of 138 kV.

### 2.3.5 Access Roads

The project would require approximately 31.43 miles of permanent access roads that would be used during the construction and then operation of the solar facility. These access roads would be located to provide access to inverters and around the project perimeter to accommodate maintenance or access during emergencies. These access roads would be located within the fenced boundary of the project and not available for use by landowners or the public during site operation. Access roads would typically be located along the edge of a solar array. Exact road locations and distances depicted in project maps are preliminary because the final array setup is not known at this time.

Project roads would typically be 12 to 20 feet wide to accommodate construction vehicle requirements. There would be approximately 38.6 acres of permanent impacts due to access road construction and use within the final design project. The topsoil and any vegetation or other organic material would be removed prior to subsoil grading and compaction. Access roads can vary in the depth of subgrade treatment and aggregate due to soil or weather conditions. Specific details of the aggregate specification are not available until the completion of detailed engineering plans, would be acquired from a local pit that meets WisDOT specifications.

When the generation site is decommissioned, permanent access roads would be removed and the land would be returned to its original condition, unless negotiated differently with the landowner.

### 2.3.6 Substations

The proposed project would include construction of a collector substation located close to the transmission interconnection point. This substation would be located approximately in the south part of the project area. The collector substation footprint would be approximately 131 feet by 165 feet in size. The substation is oriented such that medium voltage collector circuits approach from the North of the substation and the high voltage transmission interconnection lines exist to the South. Site grading will be required to bring the transformer pad to the engineered elevation. Best Management Practices (BMPs), such as temporary seeding and silt fences, will be implemented prior to commencing civil work.

A perimeter security fence made up of chain link fence with barbed wire, with access gate, would surround the substation facilities, as required by the National Electric Safety Code. Within the fenced area, the collector substation would include:

* Auxiliary power transformers
* Lightning protection shield wire
* 34.5kV feeder breakers for each collection feeder;
* 34.5kV collection feeder buses;
* 138/34.5kV transformer
* Disconnect switches for all breakers;
* 138kV circuit breaker;
* 138kV dead end structure;
* 138kV overhead transmission lines leaving the substation; and
* A control building with supervisory control and data acquisition (SCADA) equipment.

The new Tennyson interconnection switchyard would be constructed and owned by ATC, located adjacent to the collector substation. The switchyard footprint would be approximately 142 feet by 168 feet and would be designed as a three position ring bus operating at 138kV.

### 2.3.7 Generator Tie Line

In addition to the solar generation facility, GCS is proposing the construction of an approximate 200 foot generator tie-line to connect the collector substation to the new ATC Tennyson switchyard. The proposed collector substation location is directly adjacent to the interconnection switchyard. The right of way will be 200 feet and has been secured with a long term solar lease and easement agreement. GCS executed a generator interconnection agreement (GIA) with MISO on April 3, 2020.

### 2.3.8 Operation and Maintenance Building

GCS proposes to construct an O&M building in the project area[[14]](#footnote-14). The building would be used as a work location for O&M approximately three full-time equivalent employees, as well as a storage facility for equipment and spare parts. Less than one acre of land would be needed for the O&M building. The building footprint and final design are not complete at the time of application submittal. GCS expects the building to be approximately 2,900 square feet in size, and constructed as a single story metal shop and office on a reinforced slab foundation with gravel driveway and parking. Outdoor lighting would be installed in the parking lot and at the O&M building door entrances and would be controlled either by motion activation. The O&M building will be located within the project fenced area. GCS would work with applicable local regulatory authorities to source water from the municipal water distribution, or if necessary from an on-site well.

### 2.3.9 Laydown Yards

Laydown areas would be needed for storing materials and equipment, vehicle parking, and hosting temporary construction offices. Laydown areas typically require removing and stockpiling topsoil, and placing a layer of aggregate material down for a stable surface. GCS proposes one primary laydown area adjacent to the project collector substation East of Stage Road. The laydown area is approximately 6 acres and would be restored to the pre-construction state after construction is complete. Construction worker parking will be included in the laydown area.

## 2.4 Project Schedule

Before construction on the proposed project could proceed, a CPCN is needed from the Commission. GCS provided an estimated project construction schedule in the application. Physical construction, including mobilization, site preparation, road construction, and driving posts for panels, is expected to start in late 2021. PV panel installation would occur starting spring 2022. Collector substation and generator tie line construction would start in the spring of 2023. Expected commercial operation of the site would be in late 2023.

## 2.5 Decommissioning Plan

No solar facility similar to the one proposed has reached the point of decommissioning or repowering, and projected actions may change from the description provided in the application materials. GCS states in its application that at the end of commercial operation, it would be responsible for dismantling facilities and restoring the site to its pre-construction condition. A final decommissioning plan was not provided with the application materials, but decommissioning actions and a preliminary cost estimate is discussed in Section 1.7.3 of the application.

Decommissioning would include removing the solar arrays and all associated facilities from the project area. Standard decommissioning practices would include the dismantling and repurposing, recycling, or disposing of the solar energy facilities, followed by the restoration of the site. Decommissioning is estimated to take approximately eight months to complete. A workforce of approximately six workers would be used for decommissioning activities.

Underground project facilities and concrete foundations would be removed and holes would be filled with adjacent top soil. To allow for agricultural use of the area the land would be tilled to break the new vegetative growth. Unless otherwise requested by a landowner, permanent access roads constructed for the facility would be removed. After all equipment is removed, the project area would be restored to a condition similar or better to its pre-construction state.

GCS does not provide a site specific cost of decommissioning, but states it will provide a non-binding estimate of decommissioning costs on a confidential basis. GCS Solar will provide security in the form of a surety bond, letter of credit, parent/corporate guarantee, or other financial instruments in the amount of the non-binding estimated decommissioning costs.

Commission staff reviewed decommissioning plans in other states, and some recent Commission dockets, where cost information, subject to revision at intervals in the future, is provided. In some states including Wisconsin, projects that are owned by regulated utilities account for decommissioning costs in the depreciation expense for a facility. However, if a project is submitted by an independent power producer or merchant plant, a financial instrument may be required to demonstrate the financial capability to respond to accidents and restore a site at the end of facility operation. It may be prudent for the Commission to review what is provided in other decommissioning plans and require some additional discussion on expected decommissioning costs and how those would be met without negatively impacting landowners or local governments. Alternatively, GCS may incorporate decommissioning costs and timelines into its agreement with the Town of Potosi or Grant County.

# 3. Environmental Analysis

Wisconsin Admin. Code § PSC 4.20(2)(c) states that the EA shall include a description of the environmental factors that the proposed project affects most directly. Wisconsin Admin. Code § PSC 4.20(2)(d)(1) directs the EA to describe the proposed project’s effects on geographically important or scarce resources, such as historic or cultural resources, scenic or recreational resources, prime farmland, threatened or endangered species, ecologically important areas, as well as the potential impacts to other environmental matters the Commission considers relevant. There would be potential impacts from constructing and from operating the new proposed facilities. These potential impacts and, if applicable, corresponding mitigation actions, are described in the following sections.

The project would use different equipment types depending on the phase of construction. During access road construction and initial grading of the site, dozers, motor graders, and rollers would be used. Pile drivers, skid steers, and telehandler forklifts would be used during the installation of supports and panels. Excavation equipment such as backhoes would be used for collector circuits trenches, with the use of horizontal directional drilling (HDD) planned for wetland and waterway crossings. Backhoes, vehicle mounted power augers, cranes, and bucket trucks would be used during installation of the generator tie line.

## 3.1 Potential Impacts to Natural Resources

### 3.1.1 Geology, Topography and Soils

The project is located in southwestern Wisconsin, in central Grant County. This area is part of the Southwest Savanna ecological landscape as categorized by the DNR. This landscape is part of Wisconsin’s Driftless Area, a region that has not been glaciated for at least the last 2.4 million years. The topography is characterized by broad open ridgetops, deep valleys, and weeded, sometimes steep, slopes.

A preliminary geotechnical investigation of the project area was conducted by Terracon Consultants, Inc. (Terracon) and the report was provided as Appendix L[[15]](#footnote-15) of the application. Twenty-three test borings were conducted in the project area with soil analysis and evaluation considering the proposed facilities to be constructed. The report stated that most topsoil in the project area is clay, from 4 to 18 inches thick. Subsoils are made up of lean and fat clays, as well as areas of lean to fat clay with variable amounts of silt seaming. Below this layer silty sand with variable weathered sandstone pieces are present. All but two of the borings were terminated due to auger refusal on probable sandstone bedrock at a median depth of 13.5 feet. Bedrock groundwater was observed in four of the soil borings, but the report states that due to low permeability of the soils in the area, a relatively long period may be needed for groundwater levels to develop and stabilize in boreholes. Groundwater levels may also fluctuate with precipitation and amounts of runoff. Dewatering may be needed during any excavations.

The soils in the project area are susceptible to frost heave, and proposed facilities could experience heaving and settlement. Piles would need to be driven to a point where frost heave would not substantially impact the facility. GCS states in the application that the geotechnical study would be incorporated into the detailed design, and the design will address the impact of frost heave by calculating the appropriate post quantity, size, and length. If the risk of frost heave is not accounted for, increased repairs would be necessary as piles might shift separately and damage solar panels, inverters, or supports.

GCS states that approximately 113 acres of grading is proposed for construction of the collector substation, switchyard, inverters, access roads, and tracker system. If excess soils are generated, they would be spread in part of the project area in accordance with the terms of the solar lease agreements, and grading back into any cropland, pasture, or wetland areas would be avoided. This can be a substantial amount of soil disturbance if done all at one time, and GCS should ensure soil stabilization work is conducted and the site remains in compliance with DNR soil erosion and storm water permits.

The application states that topsoils would be stripped prior to the construction of project access roads. Assuming an average of 11 inches of topsoil, across approximately 31.43 miles of roads, there would be approximately 113,000 cubic yards of topsoil removed and thin spread in nearby areas. Trenching to install collector circuits should ensure that topsoils and subsoils are kept separate and replaced in correct order to avoid impacts to vegetation establishment. Depending on the soil conditions at the time of construction, matting or low pressure equipment, or decompaction of soils after work, may be needed to improve conditions for vegetation establishment.

#### 3.1.1.1 Soil Erosion Control

The soils in the project area have moderately high runoff potential during precipitation events. Without adequate soil erosion control measures put into place, there could be erosion during times of heavy precipitation. This could increase sediment loads to local streams or wetlands. It could also cause erosion of soils or flow of storm water onto adjacent properties. GCS provided a Preliminary Erosion Control Plan created by EVS, Inc (EVS) as Appendix R of the application. This would need to be updated with final construction plans prior to use. Some assumptions of the plan, such as preventing more than 10 acres of soil disturbance draining to a common discharge point are unlikely to be accurate based on observations of solar facilities construction in Wisconsin to date. The plan should be accurate and consider use of Best Management Practices (BMPs) to avoid issues with non-compliance with DNR permits.

The following actions are examples of BMPs that should be taken to reduce the impacts of soil erosion and storm water runoff during construction:

* Preserve existing vegetation as much as possible on site and limit the amount of grading done to reduce soil disturbance.
* Installation of temporary erosion control measures such as wattles, silt fences, or erosion control matting.
* Seeding or stabilization of areas of bare soil after site grading or topsoil stockpiling. The time of year may require use of mulches or other stabilizers if seeds would not germinate and establish in time to stabilize soils.
* Establish stabilized construction entry/exists including rock/aggregate vehicle pads.
* Monitoring of erosion control measures every seven days or within 24 hours of a rainfall event of 0.5 inches or greater.

As the erosion control and storm water plan provided with the application is preliminary, and does not reflect specific construction plans or schedules, a finalized, site-specific plan would be required when a DNR Wis. Admin. Code § NR 216 permit is obtained for the construction phase of the project. During the operational phase of the project, a low impact development plan would include the maintenance of vegetated areas under the arrays and along the perimeter of the site to minimize storm water runoff and soil erosion.

### 3.1.2 Water Resources

#### 3.1.2.1 Storm Water Runoff

The project must meet Wisconsin Pollutant Discharge Elimination System (WPDES) storm water regulations as established by the Clean Water Act and regulated by the Wisconsin DNR. The DNR’s Storm Water Discharge Permit Program is administered under the authority of Wis. Admin. Code [ch. NR 216.](http://www.legis.state.wi.us/rsb/code/nr/nr216.pdf) There would be an increase in the impervious surfaces across the project site through increased aggregate surfaces for roads, as well as the substation, O&M building, and associated parking area. Post-construction runoff from these types of sites are typically managed with swales and drainage basins. Solar panels are also impervious surfaces which concentrate runoff and have potential to cause erosion and increased runoff from the site. These issues can be minimized by spacing arrays to maintain vegetation between and underneath panels. Appendix R to the application quantifies the amount of impervious surface across the site as approximately 40.6 acres for storm water analysis calculations[[16]](#footnote-16).

Well-maintained vegetation between and underneath solar panels can minimize water scour or erosion from driplines, filter runoff, and improve infiltration capacity of the soil. DNR storm water staff agree that in areas planted with grassland that used to be row cropland, infiltration of storm water would improve. Vegetation under and around the arrays would require long-term maintenance for the lifetime of the facility, as it would be the primary means of managing post-construction storm water runoff. GCS should also minimize the vertical clearance between the panels and the ground in order to reduce the potential for erosion and scour at the dripline of the panels. The exact amount of increased impervious surface would be determined in final engineering design of the site, and would be discussed in the Storm Water and Erosion Control Plan submitted to the DNR as part of the permit application under Wis. Stat. § 30.025 and Wis. Admin. Code ch. 216.

#### 3.1.2.2 Wetlands

***Wetland Identification and Quality***

Wetlands within the project area for the proposed generation facility were identified during wetland delineations conducted in the 2018 to 2020 growing seasons. This field surveyed project area encompasses all proposed project components and construction areas, including: proposed arrays, alternative arrays, access roads, fencing, temporary workspaces including laydown yards and staging areas, collector circuits, O&M building, collector substation, interconnection switchyard, and the 200-foot 138kV generator tie line. Fifteen wetlands, comprised of wet meadow, shallow marsh, seasonally flooded basin, and floodplain forest wetland types, were identified within the project area. Based on field investigations, one wetland (Wetland 2, floodplain forest) was characterized as high quality, while the remaining wetlands were characterized as low quality due to the presence of invasive species and receiving runoff from adjacent agricultural practices.

***Potential Wetland Impacts***

None of the wetlands identified within the project area are proposed to be impacted by the project construction. Wetland impact avoidance is proposed to be achieved due to siting all project components outside of wetland, by avoiding crossing wetlands by vehicles and equipment and collector circuits. No clearing of forested wetlands is proposed.

***Wetland Impact Avoidance and Minimization***

While direct wetland fill from construction activities is not proposed, wetlands are present immediately adjacent to construction areas. To ensure wetlands are not unintentionally directly or indirectly impacted during construction, the following measures should be implemented:

* + Install signage at wetland boundaries to alert construction crews to not work within or access through these wetland areas.
  + Site-specific sediment and erosion control measures and devices should be installed prior to construction activities and inspected and maintained daily throughout all construction and restoration phases.
  + Provide copies of all plans and environmental site maps to construction crews. These documents should clearly label all wetland locations and include language stating vehicle access, storage of materials, grading, and all other construction activities are not allowed within wetlands. These documents should also clearly label where sediment and erosion control devices need to be installed when working adjacent to wetlands.
  + Implementing a construction sequencing plan that minimizes the amount of land disturbed or exposed (susceptible to erosion) at one given time across the project.
  + Revegetating disturbed areas and areas of exposed soil as soon as possible, and seed with a cover crop and/or native seed mix to help prevent the establishment of invasive species.
  + Preparing and implementing an invasive species management plan that identifies known areas of invasive species populations, addresses site restoration activities, and includes specific protocols to minimize the spread of invasive species. Best management practices (BMP’s) should be used, including cleaning construction vehicles and using construction matting. To minimize the introduction of new invasive species populations, equipment and matting should be cleaned before entering this site or moved between sites.
  + Preparing and implementing dewatering practices that prevent sedimentation into wetlands.
  + Scheduling construction to avoid disrupting sensitive species.
  + Limiting the amount of time necessary to complete construction.

If the above measures are not implemented during construction, wetland impact could occur. Potential wetland impacts could include but not be limited to rutting and soil mixing from vehicles and equipment driving over wetlands when the ground is not frozen, sedimentation into wetlands if proper sediment and erosion control devices are not installed or not maintained correctly, and the introduction and/or spread of invasive species into wetlands.

Temporary seeding should be used in areas of exposed soils where construction has temporarily ceased. Seeding disturbed wetlands with a cover crop would help prevent the establishment of invasive species and would not compete with the existing seed bank. Disturbed wetlands not infested with invasive species should be evaluated individually for revegetation with either a native seed mix or by allowing the native seed bank to reestablish naturally, and wetland areas infested by invasive species should be revegetated with an annual cover crop. Sediment and erosion control devices should be installed before ground disturbance occurs to reduce erosion and trap sediment from entering sensitive resources. Once permanent erosion control measures are installed, and vegetation is reestablished, temporary erosion control measures would be removed.

Site restoration consists of the activities required to return the areas impacted by the construction of an approved project back to their original condition, if not better. Restoration typically occurs in any disturbed areas within the project area, including temporary construction areas, staging areas or laydown yards, transportation routes, off-ROW access roads, and any other areas used for project related activities. Site restoration, including revegetation, of the disturbed areas should be completed as soon as possible following construction.

GCS states that it would utilize its internal environmental construction compliance program that ensures compliance with all environmental permits, plans, and regulations applicable to each project. An environmental monitor would conduct ongoing onsite inspections during construction to ensure all employees are environmentally aware and ensuring compliance throughout construction.

#### 3.1.2.3 Waterways

***Waterway Identification and Quality***

Waterways within the project area for the proposed generation facility were identified during field surveys conducted in the 2018 to 2020 growing seasons. This field surveyed project area encompasses all proposed project components and construction areas, including: proposed arrays, alternative arrays, access roads, fencing, temporary workspaces including laydown yards and staging areas, collector circuits, O&M building, collector substation, interconnection switchyard, and the 200-foot 138kV generator tie line. Based on field investigations, several waterways are present within the project area. None of these waterways are classified by the DNR as trout streams, Areas of Special Natural Resource Interest, or Exceptional or Outstanding Resource Waters.

***Potential Waterway Impacts***

None of the waterways identified within the project area are proposed to be impacted by the project construction. Waterway avoidance is proposed to be achieved due to siting all project components outside of waterways, by avoiding crossing waterways with vehicles or equipment, and by utilizing Horizontal Direction Drilling (HDD) installation method to install collection lines under waterways, which avoids direct impact to waterway bed and banks. Fourteen waterway crossings would be installed across via HDD for the project’s collections line installation. No woody vegetation clearing along waterways is proposed.

***Waterway Impact Avoidance and Minimization***

Waterways are present immediately adjacent to construction areas. To ensure waterways are not unintentionally directly or indirectly impacted during construction, the following measures should be implemented:

* + Install signage at waterways to alert construction crews to access across them.
  + Site-specific sediment and erosion control measures and devices should be installed prior to construction activities and inspected and maintained daily throughout all construction and restoration phases.
  + Provide copies of all plans and environmental site maps to construction crews. These documents should clearly label all waterway locations and include language stating vehicles and equipment cannot drive across waterways. These documents should also clearly label where sediment and erosion control devices need to be installed when working adjacent to waterways.
  + Implementing a construction sequencing plan that minimizes the amount of land disturbed or exposed (susceptible to erosion) at one given time across the project.
  + Revegetating disturbed areas and areas of exposed soil as soon as possible, and seed with a cover crop and/or native seed mix to help prevent the establishment of invasive species.
  + Existing vegetative buffers should be left undisturbed whenever possible to minimize erosion potential and maintain shaded cover.
  + Avoiding the use of herbicides near waterways, or utilizing herbicides approved for use in aquatic environments.

Minor beneficial and indirect impacts to waterways in the project area could result from a decrease in the amount of fertilizer and pesticide runoff as a result of the change from agricultural land use to the solar facility. Reducing the regular disturbance of vegetation and soil could also reduce local soil erosion and sedimentation once the site has established vegetation.

GCS states that it would utilize its internal environmental construction compliance program that ensures compliance with all environmental permits, plans, and regulations applicable to each project. An environmental monitor would conduct ongoing onsite inspections during construction to ensure all employees are environmentally aware and ensuring compliance throughout construction.

#### 3.1.2.4 State Wetland and Waterway Impact Permitting

Wisconsin Stat. § 30.025 describes DNR process for reviewing and permitting utility projects that require authorization from the Commission and DNR. DNR is responsible for regulating the discharge of dredge and fill material into wetlands under Chapter 281.36, Wisconsin Statutes, and Wisconsin Administrative Code. DNR is also responsible for regulating direct impacts to navigable waterways and waterbodies under Chapter 30, Wisconsin Statutes, and Wisconsin Administrative Code. Some of the state legal protections and permitting requirements for activities affecting public waterways include, but are not limited to:

* Wis. Stat. § 30.12 and NR 329, Wis. Admin. Code, requires permits for structures placed on the bed of navigable waters;
* Wis. Stat. § 30.123 and NR 320, Wis. Admin, Code, requires permits for bridges placed over public waters and culverts placed within navigable waters;
* Wis. Stat. § 30.19 and NR 341, Wis. Admin, Code, requires permits for grading on the banks of navigable waters;
* Wis. Stat. § 30.195 requires permits for channel relocation of navigable waters;
* Wis. Stat. § 30.20 and NR 345, Wis. Admin. Code, requires permits for removing material from the bed of navigable waters;
* Wis. Stat. § 30.29 prohibits the operation of motor vehicles in navigable waters unless it qualifies under one of the exemptions or is approved through a permit authorization.

DNR participates in the joint review process with the Commission, as detailed in Wis. Stat. § 30.025, with respect to wetlands and navigable waterways.  As currently proposed, the project would not require wetland permit coverage from the DNR. Also, as currently proposed, the project would not require waterway permit coverage from the DNR.

### 3.1.3 Forested Land Impacts

Forests in this part of the state consist of midwestern broadleaf forests, with dominant species consisting of maple, basswood, oak, pine, and ash. The majority of lands in the project area are non-forested, agricultural lands. Forests in the project area are often isolated or fragmented within the landscape, occasionally connected with windbreaks or thin tree lines around property boundaries or riparian areas. Generally, solar projects in Wisconsin have avoided forested areas due to the ready availability of open, relatively flat, agricultural land that does not require tree clearing. Some tree lines or windbreaks may be cleared to avoid shading of panels depending on the array layout.

The proposed project avoids impacts to forest lands for most of the arrays. Tree clearance across the project area appears limited to tree lines or isolated trees, with no substantial acreages of forest land clearance within arrays.

### 3.1.4 Endangered Resources

The state’s Endangered Species Law, Wis. Stat. § 29.604, makes it illegal to take, transport, possess, process, or sell any wild animal that is included on the Wisconsin Endangered and Threatened Species List.  In addition, it is illegal to remove, transport, carry away, cut, root up, sever, injure or destroy a wild plant on the Wisconsin Endangered and Threatened Species List on public lands.  Although utility practices are exempted from the taking prohibitions of listed plant species on public lands, it may still be prudent for the applicant to actively avoid activities in certain areas that are known to host rare plants.  The Federal Endangered Species Act (ESA) protects all federally listed animals from direct killing, taking, or other activities that may be detrimental to the species. Federally listed plants have similar protection, but the direct killing or taking prohibitions are limited to federal lands or when federal funds/permits are necessary. In addition, there may be other state and federal laws protecting rare species including the federal Migratory Bird Treaty Act, the federal Bald and Golden Eagle Protection Act, and the Protected Wild Animals (NR 10.02 WI Admin Code).

A certified Endangered Resources (ER) Review was completed for the project area using the DNR’s Natural Heritage Inventory (NHI) database which includes both state and federally listed species.  The project area evaluation includes both the route and a buffer of one mile for terrestrial and wetland species and a two-mile buffer for aquatic species.  While the existing sources of information are important for estimating impacts to rare species, they are incomplete.  Additional rare species beyond those currently identified may actually be present within project boundaries.  The NHI database is updated frequently and should be reviewed within a year of project activities occurring to ensure species information is as accurate as possible.  The review was checked and approved by the DNR ER Utility Liaison.  The ER Review identified several endangered resources; however, none of them have suitable habitat within the project area and therefore, this project will not have impacts to those species.

If approved, this project would begin construction over a year from the certified ER review date. DNR regularly updates the NHI database as new species records are discovered and when previous records are checked to determine if the species is still present. If the project is approved, GCS should conduct an updated review closer to the construction start date (no more than one year out) to determine if any change to the ER review would create the need for additional actions to avoid impacts to protected species.

### 3.1.5 Wildlife Impacts

The predominant land use of the proposed solar facility is agricultural row crops, along with areas of pasture and fallow fields. The most common wildlife in these fields are likely species that are generally more common and are accustomed to agricultural habitats or human disturbance. Examples of these species include deer, squirrel, raccoons, mice, moles, voles, common perching birds, red-tail hawks, pheasant, turkey, and geese. These species generally do not require specialized habitats and would be able to find suitable habitat nearby. Wildlife that resides within the construction zone of the project would likely be temporarily displaced to adjacent habitats during the construction process. If erosion control netting is used, it would be beneficial to use wildlife-friendly varieties, rather than plastic netting, which can entangle small wildlife species.

Once the facility is operational, the current agricultural habitat would be replaced by a long-term established grass habitat, with smaller areas of pollinator plantings. The decrease in vegetation disturbance and more diverse species composition may benefit species of grassland birds and other wildlife.

Use of the deer exclusion fence around arrays, similar to what was recommended by the Minnesota DNR for large solar sites and required by the Commission in previous solar dockets should allow for the passage of smaller mammals, reptiles, and amphibians while preventing the access of larger animals such as deer. By not using barbed wire on the array fences, the risk of wildlife injury due to entanglement is decreased. The additional fencing in the landscape around the arrays would affect wildlife movement corridors across the project area. Larger animal species would find the fenced arrays a barrier to movement, which could cause habitat fragmentation. Where a solar facility fence line runs along a road, deer that start to proceed along the ROW may have movement restricted, which could lead to more interactions with drivers. The proposed project does have some areas free of fences, particularly along drainage features or waterways, where wildlife may find routes between the arrays.

Large-scale solar facilities are a relatively new addition to the landscape and research is ongoing to determine impacts to wildlife. Most research on the impacts of solar facilities on wildlife has occurred in different habitats than are found in Wisconsin. In 2016, a multi-agency collaborative working group released an avian-solar science coordination plan[[17]](#footnote-17) that discussed ways solar development may affect birds and areas where more information is needed to understand potential impacts to birds. There have been few studies, particularly systematic studies of mortality, at comparable large-scale solar facilities. The Commission required the first two solar facilities it authorized, Badger Hollow and Two Creeks, to conduct post-construction mortality surveys. However, these projects have not yet finalized the survey methodology, and any results from the surveys are years away. In 2019, the Department of Energy[[18]](#footnote-18) announced that it would award $4.3 million in grant funds to three projects to study solar project effects on bird populations. Although the impacts to birds from a solar facility are likely to be less significant that impacts from building window strikes, cats, or climate change in terms of sheer numbers, continuing to build the understanding of how solar facilities at this scale impact species is necessary to acknowledge and mitigate the specific impacts of any given project.

### 3.1.6 Historic Resources

GCS hired Commonwealth Heritage Group (Commonwealth) to conduct a review of historic resources within the project study area. The study area for direct impacts included all areas where there could be ground disturbance for all possible solar facilities (proposed and alternative arrays), totaling 2,057 acres.

Commonwealth’s review included a desktop review of the Wisconsin Historical Society’s (WHS) Wisconsin Historic Preservation Database (WHPD) and information from the National Register of Historic Places (NRHP), and a field investigation. This review identified 13 archaeological sites previously identified in WHPD within one mile of the project study area, one site being located within the project study area. The field investigation identified an additional four sites within the project study area and one new archaeological site abutting the project study area. Three of the five sites within the project study area were determined not to meet the minimum requirements for listing in the NRHP. Two of the five sites (a historic burial site and an archaeological site) within the projects study area, and the single site abutting it, were recommended to be avoided with a minimum 50-foot setback. GCS states that construction will avoid these sites.

A review of WHPD for above-ground resources identified nine resources within one mile of the project study area and are associated with a farmstead. None of these structures are eligible for the NRHP. GCS states that the project will not affect any cultural resources.

No human burial sites will be affected by the project. Therefore, no Burial Site Disturbance Authorization/Permit is required from WHS. If the applicant encounters grave markers or human skeletal remains during construction, all activities in the area would cease and the State of Wisconsin Burial Sites Preservation Office would be contacted for further instructions.

### 3.1.7 Invasive Species

Non-native plants, animals, and microorganisms found outside of their natural range can become invasive when they colonize new ecological communities. Non-native invasive species are highly tolerant of a wide range of conditions and are able to quickly establish and spread in new communities. Over time, non-native invasive species can overwhelm an area and eliminate native species, subsequently reducing biodiversity and negatively affecting local ecological communities.

A targeted survey of the project study area to identify invasive species does not appear to have been conducted; however, the applicants noted the following invasive species (all listed as restricted in Wis. Admin. Code ch. NR 40) in the project area during site visits in 2018 and 2019:

* reed canary grass (*Phalaris arundinacea*)
* hybrid cattail (*Typha x glauca*)
* garlic mustard (*Alliaria petiolate*)
* Canada thistle (*Cirsium arvense*)
* multiflora rose (*Rosa multiflora*)
* emerald ash borer (*Agrilus planipennis*)

Construction of the proposed project may cause the spread and establishment of noted non-native invasive species as well as others in the project area that were not identified by the applicants during their initial site visits. Construction equipment traveling from infested to non-infested areas could spread noxious and/or invasive weed seeds and propagules between array sites, laydown yards, access roads, etc. The removal of existing vegetation during construction causes soil disturbance and removes vegetative competition that could increase the subsequent spread and establishment of noxious and invasive species. Although much of the proposed project area is currently in agricultural production where weeds are typically controlled to increase crop production, removal of vegetation may release existing seedbanks and expose bare soil allowing for new populations to establish, if not monitored or controlled effectively.

The applicants noted that they would implement the following best management practices (BMPs) to minimize or prevent the spread of invasive species throughout the project area during construction:

* machinery would be cleaned prior to delivery,
* if cleaning is needed throughout construction, cleaning would take place on aggregate in the laydown yard,
* all equipment used, including construction matting, would be cleaned prior to work in areas without invasive species,
* minimize soil disturbance,
* weed control consisting of mowing and herbicide treatment,
* herbicide application would be done by certified pesticide applicators,
* annual monitoring, and
* adaptive management of invasive species.

In addition to the noted BMPs above, the applicants should clean equipment whether or not it is entering an area with existing invasive species. The equipment may be carrying new invasive species that could cause new infestations of invasive species or noxious weeds. The applicants should also conduct targeted surveys for invasive species prior to construction. By identifying and mapping out known locations of invasive or noxious species, the applicants could be more strategic and efficient (saving time and money) with the types of BMPs they implement over such a large project area. Another critical element to effectively control invasive species includes a site specific monitoring plan. Contractors and staff that access the site should be trained to look for early establishing invasive species and have a process for mapping and reporting new populations for treatment. The plan and list of species should be adaptive, and able to address new invasive species that might be found in the project area.

In addition to invasive and noxious plant species in the project area, emerald ash borer, gypsy moth, heterobasidion root disease (HRD), and oak wilt are all found in Grant County. The applicants noted the presence of emerald dash borer in the project area. Though proposed tree clearing activities are limited, any tree clearing activities should take into account current Wisconsin-specific BMPs[[19]](#footnote-19) to prevent the introduction and spread of tree pests and diseases.

Wis. Admin. Code ch. NR 40 prohibits certain activities that result in the spread of invasive species and establishes preventive measures to assist in minimizing the spread of invasive species. The applicants are required to comply with the regulations in Wis. Admin. Code ch. NR 40 and are encouraged to follow preventative actions (i.e. implementation of BMPs). More specifically, to minimize the potential impacts of spreading existing and introducing new invasive and/or noxious species into the project area, the applicants should implement the BMPs in the WI Council on Forestry’s publication for Transportation and Utility Rights-of-Way Manual.[[20]](#footnote-20)

### 3.1.8 Vegetation Management

Unlike solar facilities located in arid desert landscapes, solar facilities cited in the Midwest can expect to have vegetation growing wherever there is not impervious surface, including fenced array areas, along perimeter fences, between and underneath panels, etc.

The applicants identify its vegetation management plan in Appendix H[[21]](#footnote-21) of its CPCN application. The applicant’s goals, in regards to how they would manage vegetation within the project area, include:

* ensuring safe production of electrical power,
* revegetation of the site,
* invasive plants and noxious weed control, and
* incorporation of native plants and pollinator-friendly species.

The applicant states that all non-impervious surfaces would be stabilized with perennial herbaceous vegetation as generally described in Appendix H. Temporary seeding would occur during construction to stabilize the soil and would be implemented according to its WPDES permit. The applicants would implement BMPs such as annual (temporary) seed mixes and winter cover crops to reduce soil erosion from construction traffic and heavy rain events. The first few years would be spent establishing compatible vegetation and once established, general maintenance (i.e. mowing) would occur throughout the life of the facilities. The applicant proposes different seed mixes for different areas within the project site. In addition, the applicant would use Integrated Pest Management practices to ensure successful establishment of vegetation and maintenance of permanent vegetative cover. As noted, the intensity of vegetation management practices are expected to decrease over time as the vegetation within the site matures.

In the vegetation management plan, the applicant took care to note restrictions in regards to mowing regimes and ground nesting birds as well as the purposeful establishment of designated areas for native, pollinator-friendly grasses and forbs. These are essential items to consider and include in vegetation management plans at solar facilities to maintain effective vegetation ground cover that ensures maximum energy efficiency, minimizes environmental harm, and maximizes environmental benefits including water infiltration, pollinator enhancements, wildlife movement, species diversity, and soil health. In addition, the University of Wisconsin – Madison has developed pollinator guidelines for solar developers as well as a certification program recognizing Wisconsin solar facilities that are pollinator-friendly. The applicant is encouraged to implement these BMPs[[22]](#footnote-22) to the greatest extent practicable.

It should be noted, that if the project is approved and the applicant implements a vegetation management regime that does not reflect its practices or seed mixes stated in Appendix H of its CPCN application, the impacts of the project could be significantly different than stated in this EA.

### 3.1.9 Air Quality

Temporary, localized impacts to air quality would occur during the construction phase of the project. These impacts would be a result of construction machinery and delivery vehicles in the project area. Diesel engines can create exhaust impacts that are typically short term in nature, but can be a nuisance or, in high enough quantities, a health hazard. Keeping vehicles and construction equipment in good working order is one way to mitigate these impacts.

Fugitive dust may be generated from excavation or grading work, exposed soils, or materials transport, and could create a nuisance for local homeowners or drivers. The extent of fugitive dust generated during construction would depend on the level of construction activity, weather conditions such as high winds, and the moisture content and texture of soils being disturbed. High winds and dry conditions increase the chance of fugitive dust affecting air quality. Watering exposed surfaces and covering disturbed soils with quick-growing non-invasive plant species can reduce the chance of fugitive dust.

No air quality impacts would be expected to occur once construction activities were complete and the project was operational. Solar facilities generate energy without the creation of regulated pollutants or carbon dioxide.

### 3.1.10 Solid Wastes

Solid wastes would be generated during the construction of this project and would need to be removed to appropriate waste disposal or treatment facilities. Examples of the types of wastes expected to be generated include scrap steel and other metals, sanitary waste, scrap plastics and wood, and other items used by construction staff. Observations of large stacks of rejected support pilings have been seen at some utility scale solar facilities in Wisconsin. During operation of the solar generating facility, staff using the O&M building would generate waste, which would need to be removed to appropriate waste disposal facilities. This would likely include defective or broken electrical materials, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous solid wastes.

The treatment of waste materials produced during the eventual decommissioning of the project is discussed in the Decommissioning section of this EA.

### 3.1.11 Hazardous Materials

During the construction phase of this project, there could be spills of potentially hazardous pollutants such as diesel fuel, insulating oils, hydraulic fluid, drilling fluids, lubricants, and solvents. These materials would be used during construction of the facilities or during the refueling and maintenance of equipment and vehicles. Herbicides could be used during construction or operation of the site. These various substances would need to be kept onsite in limited quantities and brought in as required. Spill kits and staff training in the use of these materials would decrease the risk of spills leading to site or water contamination. Batteries used in vehicles or machinery could also be a source of hazardous materials depending on the type of battery used and would need to be disposed of at appropriate disposal facilities. GCS states that a Spill Prevention, Control, and Countermeasures Plan would be developed and implemented to outline procedures and preventative measures for handling onsite chemicals during construction and operation.

There have been questions raised by the public regarding hazardous materials in solar panels. The use of cadmium telluride (CdTe) in thin film PV modules raises concerns because cadmium is a heavy metal with known negative health effects if inhaled or consumed. There is less data in scientific literature[[23]](#footnote-23) discussing the human toxicity of CdTe, but it is thought to be less toxic than the individual elements[[24]](#footnote-24). A report by FirstSolar, one producer of thin film PV panels, states that in case of PV module breakage, chemical degradation is unlikely due to the low vapor pressure and low solubility of CdTe. The design of the panels should also prevent the release of this element into the environment, as the layer of CdTe is laminated and between two sheets of glass and adhesive. If panels are broken, or at the end of their useful life, the goal is to recycle materials, rather than placing them in landfill[[25]](#footnote-25). This would further avoid the potential for any leaching of Cd or Te into soils or groundwater. With the information available, the risk of any heavy metals affecting the environment through the use or correct disposal of CdTe panels is not significant. Mono-crystalline silicon panels, which are also under consideration by GCS for use in this project, do not use CdTe and would further reduce the risk of hazardous materials leaching into soil or groundwater.

## 3.2 Potential Impacts to Community Resources

### 3.2.1 Agricultural Land Impacts

In many Commission reviews where a project would impact agricultural lands, the Department of Agriculture, Trade, and Consumer Protection (DATCP) would complete an Agricultural Impact Statement (AIS) for use during land right acquisition discussions between a farmer and utility. As a wholesale merchant plant, GCS does not have condemnation rights and therefore is exempt from the AIS statute (Wis. Stat. § 32.035). In other solar projects proposed by merchant plants, DATCP has provided letters confirming the understanding that since there is no condemnation authority, there is no scope for DATCP to produce an AIS.

Potential construction related impacts on agricultural lands outside the fenced arrays could consist of crop losses, soil mixing, and/or soil compaction along equipment access routes or staging areas. GCS could mitigate these short term impacts by providing compensation to the farmer for crop loss, and/or by restoring agricultural lands to pre-construction conditions. GCS could minimize construction impacts on agricultural soils by using one or more of the following techniques: completing construction during dry or frozen conditions; using equipment with low ground pressure tires or tracks; placing construction matting to help minimize soil and vegetation disturbance, and distributing axle loads over a larger surface area to reduce the bearing pressure on agricultural soils. Subsoils are less productive than topsoil, and mixing the soil types should be avoided as much as practicable. This includes avoiding creating large ruts, which can lead to soil mixing. GCS states that any excess excavated soils would only be spread within the project area in accordance with terms of the solar lease agreements with landowners. Field perimeter fences may need to be removed or altered during construction.

During the operation of the solar facility as proposed, land used for solar arrays would no longer be available for crop production or manure disposal. Farmland leased for the project would not be available as rental cropland during the project lifespan, which might drive up rental prices on other local fields due to a decreased supply. Because the land would be taken out of agricultural production, there would also be a reduced demand for agricultural products and services in the immediate area, such as seed, fertilizer, and harvesting services. Fields would no longer be available for manure spreading, which may increase the amount that is applied to surrounding fields or increase the distance it would need to be transported for disposal if dairy farms in the area continue normal operations. Further, if the land proposed for the facility were purchased rather than leased, it may affect the likelihood that the land would be returned to agricultural use.

The predictable annual payments to participating landowners can support continuing agricultural operations on their remaining lands not leased for the project. Some landowners have used the opportunity to retire from farming, relying on the income stream from the project for much of their income.

GCS states that any area used for temporary laydown yards and/or parking only for use during construction would be converted to a native vegetated state for the remainder of the generation facility’s operation. GCS states that agricultural lands impacted by the project could be returned to agricultural production after decommissioning of the project. When the project is decommissioned, the solar panels could be removed, the land tilled to break up the ground cover, and access roads removed and replaced with topsoil. GCS states that crop yields would be expected to return to preconstruction levels. However, because a solar farm of this size on farmland has never been decommissioned this cannot be known with certainty. GCS also states that in the unlikely event that preconstruction crop yields are not restored, any compensation would be governed by the respective landowner lease agreement.

#### 3.2.1.1 Agricultural Land Use

Across the 2,058-acre project study area, 92% of the land is currently in agricultural use. Most of the agricultural lands are in corn, soybean, and wheat production. There are no properties within the project study area that are enrolled in the Conservation Reserve Program (CRP), administered by the US Department of Agriculture (USDA).

The 2017 Census of Agriculture report[[26]](#footnote-26) for Grant County stated that there were 2,482 farms, totaling 600,324 acres, in the county. This was an increase of two percent in agricultural land from the 2012 Census. Using approximately 1,403 acres as described as the area for the project to generate 200 MW and the 6 acres dedicated to the laydown area, the amount of land that would be removed from agricultural use during the life of the project would be approximately 0.2 percent of Grant County’s agricultural land. The Town of Potosi covers 36,928 land acres, therefore the proposed 1,403-acre project would be approximately 3.8 percent of the town’s land acreage. According to the 2019 Grant County Farmland Preservation Plan[[27]](#footnote-27), approximately 20 percent (150,000 acres) of Grant County is categorized as Most Capability Group I and II soils (prime farmland), which have the soil quality, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. Approximately 16 percent (120,000 acres) is categorized as Most Capability Group III (farmland of statewide importance), approximately 31 percent is categorized as Most Capability Group IV and VI (farmland of local importance). In total, these lands make up approximately 67 percent (503,000 acres) of the county. The 1,607-acre project area includes approximately 1.6 percent of the Town’s prime farmland that would be impacted by the proposed project. Maps of the area show that not all proposed solar facility acres fall into this designation, with the 1.6 percent being a worst-case scenario for prime farmland acreage impacts. The 1,607-acre project area includes approximately 2.4 percent of the Town’s farmland of statewide importance that would be impacted by the proposed project. Maps of the area show that not all proposed solar facility acres fall into this designation, with the 2.4 percent being a worst-case scenario for prime farmland acreage impacts.

All of the land in the project is zoned as ‘Farmland Preservation’ by Grant County, which complies with Wisconsin’s Farmland Preservation law, Wis. Stat. § ch. 91. Utility substations are considered as a conditional use of this land designation. Utility use is stated in Wis. Stat. § ch. 91 and promulgated by Grant County as a conditional use, if the political subdivision finds that the following applies:

1. The use and its location in the farmland preservation zoning district are consistent with the purposes of the farmland preservation zoning district.
2. The use and its location in the farmland preservation zoning district are reasonable and appropriate, considering alternative locations, or are specifically approved under state or federal law.
3. The use is reasonably designed to minimize conversion of land, at and around the site of the use, from agricultural use or open space use.
4. The use does not substantially impair or limit the current or future agricultural use of surrounding parcels of land that are zoned for or legally restricted to agricultural use.
5. Construction damage to land remaining in agricultural use is minimized and repaired, to the extent feasible.

There is no mention of solar generation facilities included in the Grant County Farmland Preservation Plan or Grant County Comprehensive Zoning Ordinance. However, Under Wis. Stat. 91.42(2) and 91.46(1)(f)28, allowable uses in a farmland preservation zoning district include “[t]ransportation, communications, pipeline, electric transmission, utility, or drainage uses that qualify under sub. (4).” Under Wis. Admin. Code ATCP 49.01(19)29, “[u]tility use” as used in s. 91.46(1)(f), Stats., includes facilities for the generation of electricity from sunlight, wind, coal, or natural gas.” Therefore, by state law, the proposed project appears to qualify as an allowable use in the farmland preservation zoning district.

#### 3.2.1.2 Drainage Tiles

Drainage tiles are commonly used in many fields in this region. However, GCS states that neither Grant County nor Potosi Township nor the participating landowners in the project retain drainage tile records. If extant, drainage tiles could be damaged during construction activities due to vehicle use, excavation, or pile driving in fields. Damaged tiles could cause slower drainage which is known to cause flooding in the fields. This impact to drainage can negatively impact vegetation establishment, which has implications for the company’s closing out of DNR permits.

GCS states that major tile channels would be completely avoided or rerouted during construction. GCS also states that if tile is damaged, cut, or removed, as a result of trenching, it would be repaired or replaced within a reasonable timeframe, taking into account weather and soil conditions. However, depending on the location of project facilities, working around driven piles or facilities at various levels of completion to attempt to repair tiles could prove difficult and ineffective, so planning and avoidance to the extent possible and prompt repair of damaged tiles would be the best way to minimize impacts. Because locating the drain tiles can be difficult, despite GCS’s approach, there remains a risk of damage due to construction that may not become clear that tiles have been damaged until after previously drained fields flood during the next heavy precipitation period, which may not occur for months or even years.

### 3.2.2 Stray Voltage

Stray voltage is a term used by the Commission to describe a physical phenomenon that may affect confined livestock, primarily dairy cows. There are numerous farms dotted throughout the project area, some of which clearly are still operating dairy farms, and others that have barns and pastures. Several riding stables are seen in the project area. Electrical systems, including farm systems and utility distribution systems, are grounded to the earth to ensure safety and reliability, as required by the National Electrical Safety Code and the National Electrical Code. Because of this, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When NEV is measured between two objects that are simultaneously contacted by an animal, a current will flow through the animal and it is considered stray voltage. Animals may then receive a mild electrical shock that can cause a behavioral response. At low voltages, an animal may flinch with no other noticeable effect. At higher levels, avoidance or other negative behaviors may result. Stray voltage may not be noticeable to humans.

Stray voltage can be caused by the operation of transmission lines in close proximity and parallel to a distribution line. To minimize the chance of stray voltage, utilities sometimes propose relocating or burying distribution lines for transmission line projects. The Commission has information on stray voltage testing and mitigation on its website in a publication[[28]](#footnote-28) on the environmental impacts of transmission lines. The Commission developed this information and its testing protocols during dockets 05-EI-106 and 5-EI-115. Similar concerns about stray voltage have been raised in both wind and solar generation projects. For transmission line and wind energy projects that are reviewed by the Commission, an order condition that requires stray voltage testing at farms located within a half-mile of the facilities is commonly included. This order condition has also been included in each of the orders for solar energy facilities already approved by the Commission. The pre-construction stray voltage testing is protective for local farmers, and also the applicant, and helps in preventing potential future litigation over stray voltage concerns.

The suggested language for this order condition would be:

The applicant shall work with the applicable distribution or transmission utility to test for stray voltage at each agricultural confined animal operation within a half mile of project facilities, prior to construction and after the project is energized. The applicant shall work with the applicable distribution or transmission utility and farm owner to rectify any identified stray voltage problem arising from the construction or operation of the project. Prior to testing, the applicant shall work with the applicable distribution or transmission utility and Commission staff to determine where and how it will conduct the stray voltage measurements. The applicant shall report the results of its testing to Commission staff.

It is worth noting that this testing protocol would be offered to all owners of confined animal operations, not limited to confined animal feeding operations (CAFO) defined by DNR as facilities with over 1,000 animals. Previous project testing has been offered to farms with far fewer animals, again, to protect both the farmer and the applicant from future problems or litigation.

### 3.2.3 Heat Island Effect

The heat island effect refers to ambient temperatures increasing due to land use changes. This effect is often experienced in urban environments as a result of increased development where heat builds up and becomes stored in rooftops or pavement. There are few studies currently available that investigate whether a similar heat island effect is created due to the operation of solar generation facilities. No known studies have been conducted in the environment and climate of the Upper Midwest.

Commission staff were able to review several peer-reviewed studies regarding heat island effects related to solar generation facilities. [[29]](#footnote-29) [[30]](#footnote-30) [[31]](#footnote-31) [[32]](#footnote-32) While none of the studies reviewed were situated in locations similar to the proposed project, each found that solar generation facilities were altering the temperature of the air and in some cases the soil nearby the solar panels by a small amount. Some of the studies found that temperatures completely returned to normal overnight, while others found that temperatures remained altered.

GCS states that project was designed to include setbacks of at least 150 feet from adjacent residential and other buildings, the panel rows would be spaced (panel edge to panel edge) 12 feet apart, the panels would be located a minimum of 20 feet from the project fence, and the project area would be revegetated after construction. GCS states that spacing within and around the solar facility would allow for cooling, and the vegetation planted would contribute to naturally cooling the air. Therefore, it is not anticipated that the heat island effect should be a significant concern.

### 3.2.4 Landowner Impacts

#### 3.2.4.1 Proximity Analysis

In previous Commission dockets for solar generation facilities, as well as in this docket, non-participating landowners adjacent to the project have voiced concerns regarding the proximity of arrays and fences to their property. Concerns raised include the noise from construction and increased vehicles in the area during construction. The concerns raised regarding the operational phase include the change in aesthetics, potential for noise or glare, limits to wildlife use of the area occupied by the array, and potential impacts to property value. Landowners requested greater setbacks in previous dockets, to lessen some of the described impacts. Table 1.5.3 in the application provides all the setbacks used by GCS in development of the proposed project. An excerpt of setbacks applicable to residences is shown in Table 2 below.

Table 2 Setbacks Stated as Used for the GCS Solar Project

|  |  |
| --- | --- |
| **Structure** | **Distance to Fence Line** |
| All Residences | Not less than 150 feet |
| Property Lines | Not less than 38 feet |
| Other Buildings (includes animal barns and storage sheds) | Not less than 150 feet |

Commission staff analyzed the layout of the proposed solar arrays and how the use of various setbacks from residences would affect the array layouts. The distances used for this evaluation were 50, 100, 150, 200, 250, and 300 feet. The analysis used centroids for residences, rather than the nearest wall, due to availability of GIS data. This may result in the nearside edge of a residence located closer to solar facilities than captured in the analysis. The intent of this analysis is to understand how many acres of proposed solar array would be within the buffers of these distances, and therefore not suitable for development should a different setback distance be selected by the Commission. The analysis found that no solar facility fences were located within 150 feet of a residence. Three non-participating residences appear to be located just within 200 feet of the solar facilities. Table 3 below shows the results of the setback analysis, including the overlap acreage (from residence centroid) and the applicable arrays.

Table 3 Commission Staff Setback Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| **Distance (feet)** | **Area Affected (Acres)** | **Arrays with overlapping acreage** | **Number of non-participating residences** |
| 50 | 0 | N/A | 0 |
| 100 | 0 | N/A | 0 |
| 150 | 0 | N/A | 0 |
| 200 | 0.11 | 12, 13, A | 3 |
| 250 | 1.03 | 8, 12 ,13, A, B | 5 |
| 300 | 3.31 | 6, 8, 9, 12, 13, A, B | 7 |

The Commission could consider requiring the use of different setback distances or screening vegetation to mitigate the impacts described by landowners that are concerned about solar facilities adjacent to their property.

#### 3.2.4.2 Landowner Agreements/Easements/Good Neighbor Agreements

Some renewable energy projects offer “good neighbor agreements” to nearby non-participating residences. These typically include payments to mitigate some impacts that may affect the non-participant. GCS stated that effects easements are being negotiated with several non-participating landowners at the time of the application and provided a sample of the agreements being offered[[33]](#footnote-33).

#### 3.2.4.3 Property Values

Residents in the project area have expressed concerns that construction of the proposed solar project would reduce their property values due to changes in views, rural character, and land use in the townships. Property values can be influenced by a complex interaction of factors specific to individual parcels. These factors can include, but are not limited to, condition, improvements, acreage, or neighborhood characteristics, as well as proximity to schools, parks, and other amenities. In addition, local and national market conditions often influence property values. The presence of a utility-scale solar PV facility would become one of many interacting factors that could affect a property’s value.

Solar generating facilities have the potential to impact property values. Negative effects from these facilities could be the result of impacts that extend beyond the immediate footprint of the arrays. Examples could include noise and visual impacts. However, unlike fossil-fueled electric generating facilities, a PV facility would have no emissions and essentially no noise impacts to adjacent land uses during operation of the facility. The installation of PV facilities would create a visual impact, but lacking the height of smokestacks or wind turbines, the visual impact at ground level, or within a neighboring building, would be more limited. Some landowners may not like the change in the area from agricultural land use, however other landowners may prefer the solar project to other land uses, such as row crop agriculture, housing developments, or industrial buildings.

A review of peer-reviewed literature found no research specifically aimed at quantifying impacts to property values based solely on proximity to utility-scale PV facilities. As the industry continues to develop, comparable data should become available. For these reasons, the impact to the value of one particular property based solely on its proximity to a utility-scale PV facility is difficult to determine. Widespread negative impacts to property values are not anticipated. In certain situations it is possible that individual property values could be negatively impacted.

On a long-term basis, improper or incomplete decommissioning of the proposed project could adversely affect local property values. GCS states that it would provide a full decommissioning plan prior to commencement of construction.

#### 3.2.4.4 Potential Property Damage

Some comments received from the public during the EA scoping period describe concerns regarding property damage resulting from extreme weather events such as high winds and tornadoes. GCS states that the racking and tracker supports are designed to withstand wind loads of 175 MPH, which takes into consideration weather specific to southern Wisconsin, including the likelihood and intensity of tornadoes. GCS states that these facilities would meet the site-specific wind load requirements of both the Wisconsin Department of Professional Services (DSPS) and the American Society of Civil Engineers (ASCE) 7-10.

In response to Data Request 3.05, GCS provided information describing measures that would be taken in the unlikely event damage to the project facilities or neighboring properties due to extreme weather, including commercial general liability insurance for bodily injury and/or property damage[[34]](#footnote-34).

### 3.2.5 Land Use Plans

The zoning map provided in the Grant County Farmland Preservation Plan depicts that the land within the project area planned for construction of solar facilities is exclusively classified by Grant County Zoning as Farmland Preservation District. As currently proposed, the fenced solar PV arrays, collector substation, interconnection switchyard, O&M building, and laydown area would not be in agricultural use while the facility is operational, which is not in keeping with the goal of using those acres as active farmland.

However, utility use is compatible with Wis. Stat. § 91 (Farmland Preservation) provided several conditions are met, which is discussed in detail in the Agriculture Use section of this EA. Areas outside the fenced PV arrays and substation could potentially continue to be in agricultural use. However, GCS states that the laydown area and 20-foot buffer around all fences would remain mowed vegetation for the life of the facility. The use of grazing sheep around the solar panels might allow the land to retain a more agricultural land use. The land could also be returned to agricultural use after the decommissioning of the solar farm. As such, the use of the leased properties for the solar facilities does not appear to be in conflict with the land use plans of the towns or county. More details would be available in the Joint Development Agreement (JDA) between Grant County and GCS, and the Town of Potosi and GCS, which are not available at the time of this EA.

GCS is not a public or investor-owned utility and does not possess eminent domain statutory authority. GCS must secure long-term lease agreements with landowners in the project area to acquire the property for the project facilities. GCS also applied additional setback distances from existing pipelines and electric transmission lines. Table 1.5.3 in the application[[35]](#footnote-35) provides the proposed setback distances for the proposed project. Commission staff is unaware of any other local development plans that would have significant impacts from the installation of the solar facilities in the project area.

### 3.2.6 Nearby Populations and Environmental Justice Issues

The proposed project is located on the USH 61/35 corridor in the Town of Potosi, in a predominantly rural part of Grant County, just north of the Village of Potosi. The population[[36]](#footnote-36) of the Town of Potosi was 849 at the 2010 census with a population density of approximately 18 people per square mile and a housing unit density of approximately 8 per square mile.

Environmental justice seeks to prevent the impacts or burdens of development from being disproportionally placed on vulnerable populations. These are groups and communities at a higher risk for poor health as a result of the barriers they experience to social, economic, political and environmental resources, as well as limitations due to illness or disability. There are no areas of disproportionately high minority populations or low-income populations in the proposed project area. Vulnerable populations include those individuals that are very young, elderly, or infirm. Local day care facilities, schools, hospitals, and elderly care facilities could have a greater potential to be affected by construction impacts such as fugitive dust, increased noise, and increased traffic hazards.

GCS states that there are no schools, day care centers, hospitals, or other health care facilities within one mile of the project. The nearest school to the project is located approximately 13.5 miles west in the Village of Cassville. The nearest day care facility to the project is located approximately 4.5 miles north in the City of Lancaster. The nearest hospital or health care facility to the project is located approximately 8.5 miles east in the City of Platteville.

### 3.2.7 Local Jobs

There would be a short-term influx of contractor employees during the construction of the project. The communities near the project are expected to experience short-term positive economic impacts during this construction phase as the employees use various local businesses for food, lodging, supplies, and fuel. Local vendors may also benefit from sales of some materials such as fuel, concrete, and aggregate materials.

The project construction workforce would consist of laborers, craft workers, and electricians, along with onsite management personnel. The project’s contractor would likely use a traveling workforce as observed on projects currently being constructed. During peak construction periods, up to 350 workers are anticipated. GCS provided a Market Impact Analysis in Appendix AA[[37]](#footnote-37) that states the project would increase the need for local construction workers. GCS expects the facility would employ two to three permanent maintenance technicians.

### 3.2.8 Local road, Rail, and Air Traffic

#### 3.2.8.1 Road Use and Traffic Impacts

There would be increased impacts to roads and traffic during the construction of the project as workers arrive and leave the site, deliveries are made, and any large machinery travels to or within the project area. GCS provided a list of roads affected by construction in Table 3.3.5.1 of the application and potential for road damage in Section 3.3.4.3 of the application[[38]](#footnote-38). GCS estimates between 9 and 15 daily deliveries of materials using road legal trucks. GCS does not anticipate using vehicles that are larger than standard flatbed and box trucks for deliveries, apart from an oversize vehicle needed for the main step-up transformer for the collector substation. The construction contractor would be tasked with obtaining any oversize-overweight permits closer to delivery dates. Any driveways onto state highways would need permits from WisDOT. GCS should ensure that appropriate aggregate tracking pads are located on access roads to reduce the amount of soils deposited on local roads when vehicles exit a construction area. Road cleaning equipment may be necessary if mud or soils are tracked onto local roads. No substantial modifications of roads in the project area are expected prior to construction. GCS does not expect to see road damage during the construction phase of the project. Repair of road damage would be a subject covered in the JDA with the affected local governments.

During construction, the volume of traffic in the project area would increase. GCS would develop and review a traffic control plan with Town, County, or WISDOT officials as appropriate. Project signage would be used to guide trucks to the appropriate roads and staging areas. Trucks would not be allowed block public roads and if needed would be directed to a designated staging area. Deliveries would be expected throughout the project construction timeline, with most of the construction equipment arriving during the mobilization phase, aggregate and other road material early in the site development phase, and equipment deliveries throughout the installation process. Most deliveries would occur during daylight hours, with some construction staff traffic in the area prior to or after daylight hours.

#### 3.2.8.2 Railroads

The project would not cross any railroads, and the proposed project is not expected to create impacts to railroads or rail traffic.

#### 3.2.8.3 Air Traffic

The proposed project is not expected to impact air traffic. GCS identified one municipal airport, one private airport, and one helipad within ten miles of the solar project facilities. Lancaster Municipal Airport is the largest public airport identified within 10 miles of the Project, and is located 0.72 miles north of the nearest part of the project facilities. The nearest private airport is Martin Fierro Airport, a private agricultural use airport facility located approximately six miles northeast of the nearest proposed solar facilities. GCS did not discover any known commercial air services, including pesticide application programs, located within in the project study area.

No impacts to air traffic are expected due to the limited height of the panels, expected to be nine feet, and the distance of the facilities to airports in the project area. Only one transmission structure is expected to be needed for the generator tie line, located in an area with existing transmission lines. As such, it is unlikely to provide a new hazard to air traffic in the area.

### 3.2.9 Municipal Services and Local Government Impacts

GCS states it would not expect to require unique public services during construction or operation of the facility. Public services in the form of fire departments, law enforcement, and emergency services are provided by the state, counties, and municipalities where the project would be located. GCS has not yet executed a JDA with Grant County or with the Town of Potosi, but states that it intends to continue to pursue JDAs depending on the County and the Town’s interest. The list of items likely to be in the JDA include the dispute resolution process, road maintenance and repair, and replacement of lost tax receipts for those entities that do not receive Utility Shared Revenue Funds.

Potosi Fire and Rescue, located approximately two miles to the south of the collector substation and O&M building, is the nearest emergency service. The O&M building would need a physical address that emergency services could use to respond to a call. GCS states that the solar generation facilities would conform to all applicable electrical and fire codes, and would not present unique or unusual fire or other safety hazards. Most research on this topic is done on rooftop mounted solar facilities, and the specific risks for those scenarios. Guidance specific to ground mounted systems is usually focused on preventing the ability of a fire to spread beyond the array. Normal local fire and EMS service would be relied upon during construction and during facility operation. GCS states it would provide a fire safety protocol for the project site to local authorities, which would outline procedures, safety drills, and training with local first responders. During operation, the facility would obtain potable water from the municipal system or, if necessary, an onsite well and sanitation disposal under Grant County permitting at the O&M building.

#### 3.2.9.1 Shared Revenue

A solar energy generation facility is considered tax-exempt utility property in Wisconsin. The loss of property taxes from the land taken up by new generation facilities could be a negative impact to any hosting municipalities and counties. However, the project owners pay into a shared revenue utility aid fund that is then distributed to both counties and municipalities by the Wisconsin Department of Revenue on an annual basis. If the proposed project is approved, Grant County and the Town of Potosi would receive shared revenue payments based on the nameplate capacity of the facility and the number of residents in their jurisdiction. This shared revenue program would not apply to nearby municipal areas where the generation facilities were not constructed.

Under Wis. Stat. 79.04, local municipalities are paid annually for generation that is located within their boundaries. A per capita limit is placed on the payments determined by the distribution formulas. The municipalities and counties that host a solar facility also qualify for an incentive payment under Wis. Stat. 79.04(7)(c)1 which applies to production plants that derive energy from an alternative energy resource. This incentive payment would be an amount that is equal to the number of megawatts that represents the production plant’s name plate capacity, multiplied by $1,000.

GCS provided an estimate of local revenue impacts and other economic evaluation in a Market Impact Analysis as Appendix AA of the application. This economic report calculates that Grant County would receive $466,666 annually and the Town of Potosi would receive $333,334 annually as Megawatt-based and Incentive Payments under the current Utility Shared Revenue Formula. This is calculated assuming a 200 MW solar facility would result in $4,000 per MW per year, or $800,000 for the project, with Grant County receiving 58 percent of the total and the Town of Potosi receiving 42 percent.

### 3.2.10 Communication Towers

GCS provided locational and descriptive data of communications towers, structures, and communications equipment near the proposed solar facilities. GCS did not provide comprehensive documentation describing communications facilities or electromagnetic interference (EMI) studies in the project area, but states that no impacts to cell phone communications, radio broadcast, internet, television communication systems, Doppler radar, or airport radar systems are anticipated from the project.

### 3.2.11 Noise

Noise is unwanted sound considered unpleasant, loud, or disruptive to hearing. Noise is measured in units of decibels (dB) on a logarithmic scale. Because the human ear is not equally sensitive to sounds throughout the range of hearing frequencies, a weighted scale is commonly used, with the A weighted scale (dBA) most often used for sound measurements affecting human hearing. Due to the logarithmic scale of sound measurements, a change of 3 dBA is considered barely perceptible, while a change of 10 dBA is perceived as a doubling/halving of noise. For reference, the sound level of normal breathing is about 10 dBA, normal conversation at three feet is about 60 dBA, and emergency vehicle sirens are about 115 dBA.

Impacts associated with noise can be subjective and vary from person to person, based on factors such as loudness, time of day, frequency, or duration, and the amount of other background noise audible to the listener. Most noise impacts caused by the project would occur during the construction phase due to the use of heavy machinery and particularly, use of pile drivers. Noise levels during operation of the solar facility are expected to be less than construction.

Construction noise would come from a series of intermittent sources, most of which would be diesel engine construction equipment. Because of the unique nature of large‑scale solar projects, construction would be spread over a large area. Construction noise impacts would vary significantly with time of day, stage of construction, and panel locations. Construction would occur primarily during daytime hours, so there should be little or no construction noise impact at night. During pile driving activities, the regularly spaced noises for the length of time of construction may be disruptive and annoying for nearby residents. Table 4 shows some of the typical noise levels at 50 feet for commonly used construction equipment.

Table 4 Average Maximum Noise Levels from Common Construction Equipment[[39]](#footnote-39)

|  |  |
| --- | --- |
| **Equipment** | **Noise level at 50 feet (dBA)** |
| Dozer | 82 |
| Grader | 89 |
| Excavator | 81 |
| Flat Bed Truck | 74 |
| Pile Driver | 110 |
| Crane | 81 |
| Roller | 80 |

During operation of the solar facility, the primary source of noise would be the inverters, the transformers, and the rotation of the tracking systems. Because the facilities would not be generating electricity at night, the tracking systems would not be rotating and inverters should be silent. Only noise from transformers would be expected during nighttime operational hours.

In previous electric generation facility projects, the Commission has typically required that a post-construction noise survey be prepared as a condition of approval of the project. A similar post-construction noise survey would likely be required of this project to confirm noise impact assumptions.

#### 3.2.11.1 Noise Level Standards

There are no statewide, county, or municipal noise standards for solar developments in Wisconsin, Grant County, or the Town of Potosi, respectively.

#### 3.2.11.2 Pre-Construction Noise Study

A pre-construction noise analysis determined the location of all noise-sensitive receptors located near the project, measured existing noise levels within the project study area, and predicted both construction and operational noise levels at noise-sensitive receptors. For more detailed information, refer to the pre-construction Sound Level Assessment Report, in Appendix S[[40]](#footnote-40) of the application. Noise-sensitive receptors for this analysis included 129 predominantly single-family residences, as well as one church and one fire station. An ambient noise survey was conducted in the project area in January of 2020 according to the PSC Noise Protocol[[41]](#footnote-41). Wind and traffic noise are the two most common and persistent sources of existing noise in the project area. Measured existing average broadband daytime noise levels range from approximately 30 to 60 dBA. Measured existing nighttime noise levels range from approximately 30 to 55 dBA.

Noise levels from the full operation of the proposed project were predicted at each noise sensitive receptor. A ground factor of 0.5 was assumed, which is a conservative representation of farmland. A range of assumptions were made regarding the noise produced by various components, including inverters and transformers.

The analysis predicted worst-case sound level at a modeling receptor is 39 dBA. Therefore, the project sound levels would be well below the most restrictive Commission-designated nighttime standard for wind energy facilities of 45 dBA at all receptors, and mitigation measures are not anticipated to be necessary.

#### 3.2.11.3 Noise Levels During Construction

GCS has not perform an analysis to predict noise levels during site preparation, civil work (grading, etc.), mechanical assembly, and electrical assembly. Noise from construction would vary at each receptor depending on the type of equipment used, the distance from a receptor, and environmental conditions.

There are some residences that appear to be less than 200 feet away from construction areas, which may experience substantial disturbances from noise, especially during the pile driver operation in the area. The noise impacts caused by construction could be mitigated somewhat by limiting the hours of construction to daytime hours and weekdays. GCS should communicate with nearby residences when construction work moves into an area to make them aware of increased noise and disturbance and provide contact information if there are any issues.

#### 3.2.11.4 Post-Construction Noise Complaints

If the project is approved, GCS may be required by the Commission’s order to collect post-construction noise measurements in accordance with the PSC Noise Protocol. These measurements are taken at the same places and during the same time periods as the pre-construction measurements. Two sets of measurements are required: one with the project in operation, and one where the facility would not be operating. This could identify any areas where actual sound levels were greater than predicted and higher than permitted levels. Given the stated assumptions in the noise analysis provided, this should be conducted to test noise levels, particularly near the substation.

GCS states in that they would fully investigate any noise complaint submitted by landowners. GCS would determine if noise reports were due to mechanical issues or faulty equipment, and repair the items. If noise is not due to mechanical faults and resolved by their repair, GCS states it would attempt to negotiate a mutually-agreeable solution.

### 3.2.12 Visual impacts, Aesthetics, and Lighting

#### 3.2.12.1 Aesthetics

The existing visual landscape of the project area is made up of large somewhat flat agricultural fields, with some woodlots and treelines interspersed with cropland. Homes and farms dot the landscape along the roads near the project area. In the nearby community or Rockville a cluster of homes is located along USH 61/35. Existing transmission lines, communications towers, and the impact the aesthetics of the project area. The scenic value, or aesthetics, of any area is a subjective matter and can depend on the values and actions of the viewer. Whether a landowner sees any benefits from the project, directly or indirectly, has been shown to influence attitudes towards aesthetic impacts. Comments from the public during the EA scoping period described some frustration at the spread out footprint of the solar facility and amount of land changed from open agricultural fields to what is characterized by commenters as an industrial landscape. This impact to aesthetics was particularly brought up in reference to homes in the area and how the change in their landscape view may affect property values.

Approximately 1,400 acres would be converted from agricultural land to the solar facility, for at least 30 years. Photo simulations of several points in the project area are provided as Appendix K[[42]](#footnote-42) of the application. Because of their relatively low height, the solar facilities would not be visible at a great distance from the project. Most aesthetic impacts would occur to nearby road users and local residents.

Visual impacts of the solar arrays would include changing open agricultural fields with woodland edges to a view of mono-structural, industrial-appearing features across the span of the fields. In some areas, agricultural features and homes along the horizon would be obscured by the panels, with only thin bands of tree-line vegetation visible above the panels. GCS’ decision to use agricultural or “deer” fencing consisting of wide woven wire and wooden posts would lessen the visual impact of the facilities, when compared to other potential fence options such as chain link.

The visual impacts of the generator tie line would be minimal and likely not noticeable given existing infrastructure at that location. Visual impacts of the substation would be more substantial than PV array sites. Fencing requirements at substations are more substantial than around PV arrays, and chain link fence with barbed wire would be required, which increases aesthetic impacts. These impacts may be lessened by being set back from the road at least 800 feet, particularly if GCS could maintain or create screening vegetation along the roadside.

The most effective way of mitigating aesthetic impacts of solar facilities is likely to be retaining existing vegetation between arrays and residences. If no vegetation exists, creating landscaping plans that use compatible vegetation to block or soften the view from a residence to the arrays may mitigate visual impacts. Finally, avoiding the placement of arrays on all sides of a residence, allowing at least one unimpeded landscape view for a resident, or setting back panels on at least one side to a point where they are at the same level as a tree line, may mitigate aesthetic impacts.

#### 3.2.12.2 Glint and Glare

Solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating designed to maximize absorption and minimize reflection. However, the glass surfaces of solar PV panels and metal supports do reflect sunlight to varying degrees throughout the day and year. The amount of reflected sunlight is based on the incidence angle of the sun relative to the light-sensitive receptor (e.g., a pilot or road user). The amount of reflection increases with lower incidence angles. The intensity of any light reflected from the solar panel would decrease with increasing distance, and landscape features such as vegetation could prevent glint or glare affecting a viewer. Topography can affect glint or glare, for example, a residence or road above a solar facility may experience more glare than when they are at the same level.

GCS contracted Stantec to perform glint and glare analyses[[43]](#footnote-43) for the proposed project arrays using the ForgeSolar GlareGauge model. This evaluation included an analysis of potential glare to 128 residences and one church within one mile of the project site, as well as nine roadways adjacent to the proposed arrays. All residences were modeled at an assumed observer height of 25 feet above the ground. Roadways were evaluated at height values of five feet for automobile drivers and nine feet for semi-trucks. The model provided the glint/glare results for a resting angle of 60 degrees. The predictions from the GlareGauge model are predicated upon certain assumptions and caveats, which can affect the accuracy of the glare analysis.[[44]](#footnote-44)

The model predicted that with a resting angle of 60 degrees none of the residences or the church analyzed would experience glare. Glare was also not predicted to be experienced at five or nine feet above ground along the roadways analyzed, including: Abing Road, USH 61/35, W Road, Moose Lane, Lone Elm Tree Road, Stage Road, Substation Road and Broulliard Hill Road. Additionally, glare is not predicted for the Grant Regional Health Center Heliport in Lancaster, a potential private airstrip located approximately 5.8 miles northeast of the project, or the northward and southward landing paths of the Lancaster Municipal Airport at any time of the year.

GCS states that in the event a complaint about glare is made within or outside the project they would address the complaint consistent with the process set forth for noise in Section 5.17.4 in the application and willfully investigate with appropriate modeling and analysis techniques. However, there may be limitations to the model that do not accurately represent all variables that could lead to glare, so it is unclear how modeling afterwards would document glare better than reports and documentation by viewers on the ground in the area. If glint or glare prove to be problematic for an observer, mitigation actions such as screening vegetation, fencing, other visual screening or altering the resting angle could be used to mitigate the impacts. As more solar energy facilities are constructed and come into operation, practical experience will help establish guidelines that may be appropriate for Commission staff to suggest for Commission consideration.

#### 3.2.12.3 Lighting

The proposed project would primarily be constructed during daylight hours, however, GCS states in the application that if an extension to available working hours is needed, temporary lighting of workspaces may occur. Portable temporary light plants and associated generators on a trailer could be moved around the construction site as needed. The main parking and laydown area may have lighting installed on poles to support construction during non-daylight hours. GCS states that it and its contractors will utilize temporary lights on the project site for safety purposes.

During operation of the facilities, the O&M building and collector substation would have lighting for security and safety of workers. The O&M area would include down-shielded lighting turned on either by a local switch, as needed, or by motion sensors that would be triggered by movement. This would reduce impacts to nearby residences compared to outdoor lighting that is constantly on.

### 3.2.13 Recreation

Land occupied by the arrays would be unavailable for hunting or other access by the public or landowners. Parks and recreational lands in the project area are not expected to be impacted by the proposed project. There are no federal wildlife refuges, federal parks, federal scenic riverways, state wildlife areas, state fisheries areas, state parks, state forests, state recreational trails, county parks, or city parks within two miles of the project area. It is unlikely that the project would be visible to visitors using any of these parks and recreational areas due to distances, treelines, and structures between the proposed solar facilities and these sites. Snowmobile trails are located in the project area, and some trails may need to be re-routed to avoid construction areas and fenced arrays.

### 3.2.14 EMF

Magnetic field levels have been estimated for the proposed generator tie line. These levels vary from location to location due to differences in current flows, conductor arrangement, and the cancellation effect of fields generated by other nearby electric transmission and distribution lines. For the overhead tie-line, the magnetic field is calculated to range from 149 to 595 milliGauss (mG) at the proposed tie-line centerline one meter above the ground. At 200 feet from the proposed tie-line the magnetic field is calculated to range from 5 to 14 mG. The range accounts for different configurations of the proposed tie-line where the minimum vertical clearance could be 16.5 feet to 40 feet above ground. For all of the underground collector circuits, the maximum magnetic field is calculated to be 11.4 mG at 5 feet away from two parallel feeders. No day care centers, hospitals, or nursing homes are known to exist within 300 feet of any of the proposed project facilities. For more information on EMF and human health, a free publication, entitled EMF – Electric and Magnetic Fields is available on the PSCW web site.[[45]](#footnote-45)

# 4. Evaluation of Reasonable Alternatives and Some of their Environmental Consequences

## 4.1 No Action Alternative

The no action alternative, which would be a denial of GCS’s application, is a potential outcome of the Commission’s consideration of this application. Another no action alternative would have been GCS choosing not to make the effort to bring this potential project to the Commission in the first place, or that effort falling short prior to filing an application with the Commission. The potential environmental consequences of the proposed project described in this EA would not occur if the Commission denies the application or if GCS had never filed an application with the Commission.

## 4.2 Alternative Sites for PV Arrays

GCS proposed a grouping of arrays that could serve as sites for the proposed 200 MW solar project. Wisconsin. Stat. § 196.491(3)(d)3 requires the Commission to consider alternative locations when determining whether a proposed generating plant is in the public interest. Wisconsin Admin. Code §§ PSC 111.53(1)(e) and (f), which implement this statutory provision, require a CPCN application to describe the siting process, to identify the factors considered in choosing the alternative sites, and to include specific site-related information for each site. Based on previous Commission process with large wind energy systems, this has been interpreted as requiring the applicant provide 25 percent additional siting areas with the proposed project as an alternative. These alternative arrays provide options the Commission could select as allowable areas for the installation of the solar electric generation facility. The Commission will account for a wide variety of factors as it reaches its decision about what sites in the proposed project area could be utilized for the installation of the solar arrays.

## 4.3 Other Alternatives

An alternative to the solar PV facility could take the form of other energy generation technologies, such as wind energy systems or natural gas electric generation facilities. Any alternative generation facility would have its own suite of impacts on the human environment, some of which would be similar to those discussed in this EA. Other impacts, such as air quality impacts, would be significantly different if an alternative that utilized fossil fuels was considered. All forms of combustible fuels, both fossil fuels and biomass, create some amount of air pollution, which would be subject to air permitting requirements.

# 5. Wisconsin Environmental Policy Act Determination

Wisconsin Admin. Code § 4.20(2)(d) identifies ten broad factors that are useful to consider when evaluating whether an EIS is warranted for a given Commission action. The following subsections consider and discuss each of the ten factors with respect to this case.

## 5.1 Effects on geographically important or scarce resources, such as historic resources, scenic or recreational resources, prime farmland, threatened or endangered species, and ecologically important areas

No geographically important or scarce resources were identified within the area to be affected by construction of the proposed project. If proposed mitigation actions are followed, the proposed project is not expected to significantly affect historic resources, scenic or recreational resources, threatened or endangered species, or ecologically important areas. There would be agricultural land taken out of production, including areas classified as prime farmland, for the duration of the project’s operation. When the project is eventually decommissioned, these agricultural areas may again be available for production.

## 5.2 Conflicts with federal, state, or local plans or policies

The large-scale, industrial-like, solar facilities proposed do not seem to be in keeping with the exclusive agricultural designation of the project area in local land use plans. The solar farm is intended to be a long-term non-agricultural land use. Applicable land use plans currently allow for solar energy production as a permitted or conditional use of land designated as agricultural preservation. The solar facilities would not interfere with farming on adjacent lands. When the project is decommissioned, the project lands could be returned to agricultural use.

## 5.3 Significant controversy associated with the proposed action

Notice of the proposed project was sent to local municipal offices and local media, as well as potentially impacted landowners. The Commission is not aware of any controversies regarding the type, magnitude, or significance of the expected environmental impacts related to the proposed project.

## 5.4 Irreversible environmental effects

Few aspects of the proposed project would be truly irreversible, although reversing project actions would incur significant costs and create additional disturbance and environmental effects. Short-term impacts such as noise, air quality, disturbance to local residents, erosion, and removal of vegetation would occur as a result of construction activities, and would not be irreversible. Fuels and some construction materials would be irreversibly committed and unavailable for other uses.

## 5.5 New environmental effects

The installation of all the solar generation facility infrastructure would be new environmental effects in the project area. The physical presence of these facilities on the landscape would create environmental effects, or changes, relating to land use, aesthetics, wildlife impacts, changes to vegetation, and storm water runoff and infiltration.

Although the Commission has approved four large solar projects in the state so far, those projects have not been fully constructed and placed in operation at the time of this review, and there are still uncertainties regarding some of the potential impacts that might occur as a result of this project. The installation of smaller solar PV facilities has occurred elsewhere in the state, although nowhere near the scale of this project. The large increase in fenced acreage along roadsides no longer accessible to certain wildlife could have effects on how animals move through the wider project area.

## 5.6 Unavoidable environmental effects

Construction of the proposed project would result in some unavoidable environmental effects in the project area that could not be avoided by array location, route selection, or construction methods. Some of these could be reduced or minimized, but would not be entirely eliminated as a result of project activities. Some of the unavoidable environmental effects would occur during construction, such as:

* Soil compaction and erosion,
* Storm water ponding and runoff,
* Disturbance to nearby residents due to noise, dust, and vibration,
* Air quality impacts as a result of diesel fumes and dust,
* Disturbance of wildlife,
* Increased traffic in the project area, and;
* Cutting or alteration of vegetation.

There would be some unavoidable impacts caused by the proposed project that would be longer term, likely lasting the entire time the project is in operation. These long-term unavoidable environmental effects include:

* Removal of agricultural land from production,
* Aesthetic impacts due to the change from a typical rural landscape to a more industrial appearance, and;
* Displacement of wildlife that previously was able to access the fenced array sites.

## 5.7 Precedent-setting nature of the proposed action

This is the seventh large utility-scale solar electric generation facility to be reviewed by the Commission. The Commission’s decision to treat this project as a Type II review under Wis. Admin. Code § PSC 4, rather than the Type III action any solar generating facility is listed as, has been useful in examining in greater detail the proposed actions and their impacts on the environment. The Commission may decide to continue to treat similar projects (size and acreage) as Type II projects under WEPA and conduct environmental assessments to analyze and review the impacts of such projects.

## 5.8 Cumulative effect of the proposed action when combined with other actions and the cumulative effect of repeated actions of the type proposed

The construction of more solar arrays in the project area, or possibly elsewhere in the state, would exacerbate some of the impacts that may be caused by this proposed project. Another large solar array would remove additional lands from agricultural use, or if no agricultural fields are available, another project may cause increased impacts to more natural areas such as wetlands, forests, or natural grasslands. Another large solar array would likely use similar fencing around the arrays, further restricting the movement of wildlife through the area and access to habitat. Additional facilities in the area would increase the impact to aesthetics and the local rural character. Further solar farm construction could displace fossil-fueled generation, benefitting air quality in areas near those types of generation sites.

## 5.9 Foreclosure of future options

The construction of the proposed solar generation facility would remove fields from agricultural production or any other use during the operational life of the project, which could be 50 years or more.

## 5.10 Direct and indirect environmental effects

There would be both direct and indirect environmental effects as a result of this project. The analysis of the proposed project by Commission staff assumes that the multiple construction methods and BMPs described in the applications and responses to data requests are implemented.

The direct impacts include disturbance to vegetation in areas of more natural habitat, where the fields are not already cleared of vegetation. There is an increased risk of soil erosion during excavation activities or if grading is done prior to vegetation establishment. In areas near wetlands and waterways, soil erosion can cause sedimentation. Topsoil loss or deposition can occur on cropland. Storm water and erosion control methods can decrease this risk. Site restoration actions, including prompt vegetation establishment on disturbed soils, can allow soil and vegetation disturbance to be temporary. Disturbed soils can be high-risk areas for invasion by non-native invasive plants. This would be an indirect and potentially long-term negative effect on the environment, particularly if difficult to control plants such as non-native phragmites were able to establish. Therefore, loose soils should be stabilized with non-invasive cover crops as soon as possible. Machinery or equipment should be cleaned in accordance with invasive species BMPs as applicable.

Construction in and through agricultural fields would result in both temporary and long-term impacts. The solar PV arrays, new collector substation, and O&M building would be out of agricultural production for the operational life of the project--potentially 50 years or more. Soil compaction and topsoil loss in agricultural fields are serious concerns and can impact future productivity. If drainage tiles are broken or damaged, the drainage of the array and surrounding fields could be affected, although some impacts might not be immediately known. The use of BMPs and post-construction soil restoration can reduce many direct impacts to agricultural operations. The eventual impacts of decommissioning the project site are not well known, but it is likely that thorough decommissioning, including decompacting soils and repairing any damaged drainage tiles, would allow for a return to agricultural use.

During construction activities, there would be increased noise, dust, and vibration in the construction areas. There would be increased traffic in the project area as employees and deliveries arrive and leave the project work areas. A visual change in the project area from open agricultural fields to a more industrial landscape would affect likely viewers differently. Some landowners that do not receive direct benefits from the project may react more negatively to the proposed project. Site-specific landscaping plans or larger set back distances might limit the impacts to adjacent landowners.

Areas through which wildlife currently freely pass would be fenced, restricting movement and use by certain species. Direct displacement of species could occur during construction activities. Indirect effects of the proposed project could include increased pressure on or use of adjacent, non-fenced areas. There could be negative effects, including mortality or injury, on birds due to the generator tie line and, potentially, the solar arrays. The environment could benefit from the use of a diverse native seed mix, particularly one that contains a range of flowering plants known to benefit pollinator species. The level of that effect would depend on the amount of, and location of, any land planted with a more ‘pollinator-friendly’ seed mix. The reduced amount of herbicides and pesticides would be a benefit to biodiversity and local water quality.

Air quality would be improved by the displacement of fossil-fueled power generation by non-emitting solar-generated electricity.

The easement payments to landowners and shared revenue dollars to the county and township could have an indirect net positive impact on the long-term economy of the area.

# 6. Recommendation

This EA informs the Commissioners, the affected public, and other interested people about the proposed project and its potential environmental and social impacts. Through data requests, additional analyses, and a review of public comments, Commission staff has attempted to provide very thorough, factual and up-to-date information about the project, potential impacts of the proposed project, and the mitigation measures that could address some of those potential impacts.

The EA concludes that construction and operation of both the solar generation facility would be likely to have a range of environmental effects. Commission staff has not identified any potential environmental effects of the proposed project that could be considered significant. This evaluation is arrived at assuming that some, if not all, of the mitigation measures proposed by GCS and Commission or DNR staff are used.

This assessment finds that approval and construction of this project is unlikely to have a significant impact on the human environment as defined by Wis. Stat. § 1.11, therefore the preparation of an EIS is not required.

\_X\_\_ Environmental review complete. Preparation of an environmental impact statement is not necessary.

\_\_\_\_\_ Prepare an environmental impact statement.

Submitted by: Tyler Tomaszewski

Environmental Analysis and Review Specialist

Date: October 27, 2020

This environmental assessment complies with Wis. Stat. § 1.11 and Wis. Admin. Code § PSC 4.20.

By: Adam Ingwell, WEPA Coordinator

Date:

STS:DL:01654911

Acronyms

|  |  |
| --- | --- |
| § | Section |
| AC | Alternating current |
| BMP | Best management practices |
| CdTe | Cadmium telluride |
| ch. | Chapter |
| Commission | Public Service Commission of Wisconsin |
| CPCN | Certificate of Public Convenience and Necessity |
| CTH | County Trunk Highway |
| dB | Decibel |
| DC | Direct current |
| DNR | Department of Natural Resources |
| DPP | Definitive Planning Phase |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EMF | Electric and magnetic fields |
| EPA | U.S. Environmental Protection Agency |
| ER | Endangered resources |
| FAA | Federal Aviation Administration |
| G | Gauss |
| HDD | Horizontal directional drilling |
| JDA | Joint Development Agreement |
| kV | Kilovolt |
| mG | Milligauss |
| MISO | Midcontinent Independent System Operator, Inc. |
| MP | Measurement point |
| MW | Megawatt |
| NEC | National Electric Code |
| NESC | National Electrical Safety Code |
| NEV | Neutral-to-earth voltage |
| NHI | Natural Heritage Inventory |
| NRHP | National Register of Historic Places |
| O&M | Operations and maintenance |
| PPA | Purchase power agreements |
| PSC | Public Service Commission of Wisconsin |
| PV | Photovoltaic |
| ROW | Right-of-way |
| STH | State Highway |
| TCSB | Temporary clear span bridge |
| USACE | U.S. Army Corps of Engineers |
| US EPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| WEPA | Wisconsin Environmental Policy Act |
| WEPCO | Wisconsin Electric Power Company |
| WHS | Wisconsin Historical Society |
| Wis. Admin. Code | Wisconsin Administrative Code |
| Wis. Stat. | Wisconsin Statutes |
| WisDOT | Wisconsin Department of Transportation |

1. PSC REF#: 388953 [↑](#footnote-ref-1)
2. PSC REF#: 391352 [↑](#footnote-ref-2)
3. PSC REF#: 392677 [↑](#footnote-ref-3)
4. PSC REF#: 393745 [↑](#footnote-ref-4)
5. Wis. Stat. § 1.12(4). [↑](#footnote-ref-5)
6. PSC REF#: 390311 [↑](#footnote-ref-6)
7. Wisconsin Admin. Code ch. PSC 111.53(1)(f) [↑](#footnote-ref-7)
8. PSC REF#: 388981 [↑](#footnote-ref-8)
9. PSC REF#: 389033 [↑](#footnote-ref-9)
10. PSC REF#: 388953 [↑](#footnote-ref-10)
11. PSC REF#: 388974 [↑](#footnote-ref-11)
12. PSC REF#: 396213 [↑](#footnote-ref-12)
13. [PSC REF#: 388953](http://apps.psc.wi.gov/pages/viewdoc.htm?docid=%20349485), page 20 [↑](#footnote-ref-13)
14. [PSC REF#: 388992](http://apps.psc.wi.gov/pages/viewdoc.htm?docid=%20349526) [↑](#footnote-ref-14)
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