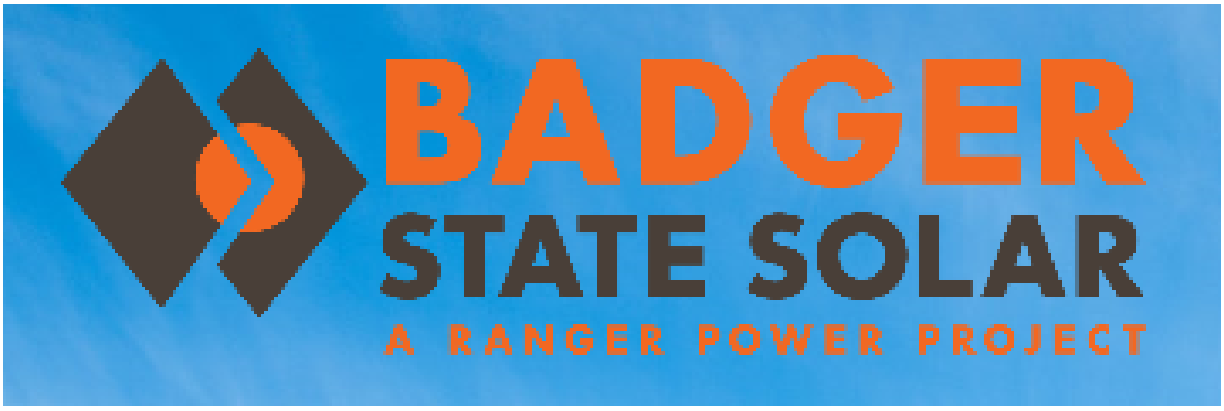
Application for Certificate of Public Convenience and Necessity
Badger State Solar LLC Solar Project
Docket #9800-CE-100
Jefferson County, WI



May 6, 2019

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Abbreviations

AC	Alternating Current
ACEP	Agricultural Conservation Easement Program
AEA	Agricultural Enterprise Areas
AHI	Architecture and History Inventory
AOI	Area of Interest
APE	Area of Potential Effect
ASNRI	Area of Special Natural Resource Interest
ATC	American Transmission Company
Badger State	Badger State Solar, LLC
BESS	Battery Energy Storage System
BMPs	Best Management Practices
BPA	Bonneville Power Administration
Commonwealth	Commonwealth Heritage Group, Inc.
CPCN	Certificate of Public Convenience and Necessity
CRP	Conservation Reserve Program
CTH	County Trunk Highway
DATCP	Department of Agriculture, Trade and Consumer Protection
dBA	A-weighted decibel level
DC	Direct current
DESRI	D.E. Shaw Renewable Investments, L.L.C.
D-FIRMS	Digital Flood Insurance Rate Maps
DOE	Determination of Eligibility
DPP	Definitive Planning Phase Cycle
EMF	Electric and Magnetic Field
ER	Endangered Resources
ERIS	Energy Resource Interconnection Service
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPA	Farmland Preservation Agreements
FPP	Farmland Preservation Tax Credit Program

FSA	Farm Service Agency
GIS	Geographic Information Systems
GHI	Global Horizontal Irradiance
GLARC	Great Lakes Archaeological Research Center
HDD	Horizontal Directional Drilling
HSIS	Highway Structures Inventory System
HUC	Hydrologic Unit Code
JDA	Joint Development Agreement
kHz	KiloHertz
KOP	Key Observation Points
LGIA	Large Generator Interconnection Agreement
Met	Meteorological
mG	milli-Gauss
MISO	Midwest Independent System Operator
MW	Megawatts
NAIP	National Agriculture Imagery Program
NHI	Natural Heritage Inventory
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Service
NRIS	Network Resource Interconnection Service
NSA	Nearest sound sensitive area
NTIA	National Telecommunications and Information Administration
O&M	Operations and Maintenance
PACE	Purchase of Agriculture Conservation Easements Program
PADUS	Protected Areas Database of the U.S.
PFW	Partners for Fish & Wildlife
Plan	Erosion Control and Stormwater Management Plan
PPA	Power Purchase Agreement
Project	Badger State Solar, LLC Solar Project
PSC	Public Service Commission (of Wisconsin)
PSI	Professional Service Industries, Inc.
PVSYST	Photovoltaic Systems Software
REM	Remnant Population Study
ROW	Right-of-Ways
RPC	Regional Planning Commission

RPS	Renewable Portfolio Standard
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SNA	State natural areas
SPCC	Spill Prevention, Control, and Countermeasures
SSURGO	Soil Survey Geographic
STC	Standard Test Conditions
STH	State Trunk Highway
TSS	Total suspended solids
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
USH	U.S. Highway
WCWRPC	West Central Wisconsin Regional Planning Commission
WisDOT	Wisconsin Department of Transportation
WDNR	Wisconsin Department of Natural Resources
WHPD	Wisconsin Historic Preservation Database
WHS	Wisconsin State Historical Preservation Society
WISLR	Wisconsin Information System for Local Roads
WPA	Waterfowl Production Area
WPDES	Wisconsin Pollutant Discharge Elimination System
WRAPP	Water Resource Application for Project Permits
WRP	Wetland Reserve Program
WTM	Wisconsin Transverse Mercator
WWI	Wisconsin Wetland Inventory

1.0 PROJECT DESCRIPTION AND OVERVIEW

Badger State Solar, LLC (Badger State) submits this Application for a Certificate of Public Convenience and Necessity ("CPCN") in accordance with Wis. Stat. § 196.491(3) and Wis. Admin Code § PSC 111.53 to the Public Service Commission of Wisconsin ("PSC" or "Commission"). The application was prepared in consideration of the guidance provided by the PSC's Application Filing Requirements for Solar Energy Projects in Wisconsin, (Guidance from PSC comment provided to Application Filing Requirements for Wind Energy Projects in Wisconsin Version 5B, February 2012) and consultations with the PSC and Wisconsin Department of Natural Resources ("WDNR").[1] The applicant is also seeking WDNR permits that are applicable to the Project as identified by the WDNR response, dated August 23, 2018, to the Applicants' submitted engineering plan.

Badger State is seeking a CPCN and all other approvals and authorizations required to construct, install operate and maintain a solar energy generating facility 149 Megawatt (MW) Alternating Current (AC) in size, known as the Badger State Solar, LLC Solar Project ("Project") to be located in the Townships of Jefferson and Oakland, both in Jefferson County, Wisconsin. Badger State will utilize a single-axis tracker system that is scheduled to be placed in service by the end of 2022. The total Project area provided for within this application will support a panel design to produce 149 MW AC of power, the required 25 percent alternative area (the Alternative Project Area) required through the application filing requirements and an optional development area (the Optional Project Area) to allow for Project flexibility and optionality during final engineering design. The total Project provided can also support a potential battery energy storage system to be considered by the applicant at a later date. More details regarding the project are provided within this application.

1.1 GENERAL PROJECT LOCATION AND DESCRIPTION OF PROJECT AND PROJECT AREA

1.1.1 Provide the following information about the Project:

1.1.1.1 Project Location - counties and townships in the Project Area.

The proposed Project is located the Townships of Jefferson and Oakland, both in Jefferson County, Wisconsin. Table 1.1-1 identifies the location of the preferred Primary Project area, an Alternative Project area and an Optional Project Area.

TABLE 1.1-1 PROJECT LOCATION

County	Primary Project Area		Alternative Project Area		Optional Project Area	
	Township Name	Sections	Township Name	Sections	Township Name	Sections
Jefferson	Jefferson	5, 6, 7, 8, 17, 18	Jefferson	7, 8, and 18	Jefferson	8, 17
	Oakland	11, 12				

[1] Numbering in this application is consistent with numbering in the Filing Requirements.

1.1.1.2 Size of Project Area in acres.

The Project study area boundary is 1,750 and includes approximately 1,740 acres under lease with land owners and available for development, before consideration of siting restrictions. The Project boundary, as shown in Figure 1.1-2 (Appendix A) was drawn taking into consideration the following:

- Location of Project facilities (panels, access roads, substation)
- Project properties under contract
- Public roads utilized for construction and maintenance
- Current setbacks per County and Township zoning
- Approximate zone of shadow/sound impact of panels

The project is situated on multiple different parcels of land with multiple property owners and contains areas identified as primary, alternate and optional. The Project area includes 1,203 acres of land to support the primary design (the Primary Project Area) which can produce 149 MW AC of power, 335 acres of land to meet the Commission's 25 percent standard for an alternative site (the Alternate Project Area) which can produce 37.25 MW of power, and an optional development area. The optional development area (the Optional Project Area), consisting of 211 acres, which is analyzed as part of this application to allow the developer some flexibility in the overall development and to preserve optionality during the final engineering process. This area can host enough panels and support infrastructure to produce 26.35 MW of power. The proposed sites and the evaluation process are described in detail in Section 1.5 below.

Badger State possesses signed land owner agreements for the parcels currently proposed to host panels (primary, alternate and optional), access roads, substation, laydown yard, transformers, junction boxes and the collection system. An operations and maintenance ("O&M") building is not proposed for this Project. However, the applicant will coordinate with the Commission if it is determined one will be needed in the future. The applicant has provided for enough leased land within the application to allow for a battery energy storage system that may be considered for the Project at a later date. No specifics for a potential battery storage system is provided within this application other than its location would likely coincide with the project substation and enough land is available within that location to support such a system. The Project will require permits from local, county and state departments of transportation to allow partial placement of the collection system in public road rights-of-way ("ROW").

1.1.1.3 Size (rated capacity), in megawatts, of the proposed Project proposed Project.

- ***(If an actual vendor is not yet under contract, the applicant must provide information on at least two panels that are being considered. Those panels must represent the maximum and minimum megawatt size under consideration for purchase for the project.)***

The full Project nameplate capacity of 149 MW AC can be achieved with the single axis tracking systems proposed for the Project. The current PV module being considered for the project is the LONGi Solar Bifacial 365-Watt module.

Currently the 420W rated PV module which has been used for the conceptual design is not available in the market. At the time of construction several PV module offerings from different suppliers will be evaluated and a selection will be made based on the most cost-effective option. The technologies that

may be considered are polycrystalline, monocrystalline and bi-facial PV modules, and the final supply of modules may contain a mix of several similar wattages. PV modules produced by a wide range of manufacturers are under consideration for the Project, including Canadian Solar, Hanwha Qcells, JA Solar, Jinko, Longi, Risen, SunPower, and Trina.

1.1.1.4 Number of panel sites proposed for the project and the number of alternate panel sites that have been identified

The Primary Project area is designed for approximately 487,848 individual photovoltaic panels with a total direct current (DC) generating capacity of 204.9 MW which, for a designed 1.39 DC-to AC ratio, is enough capacity to meet a nameplate generation of 149 MW AC power. The total number of panels within this area cover a total 742.4 acres. When the panels are in their horizontal position in the tracking system, the panels cover approximately 128.1 acres of this total area. The Primary Project area includes ten panel array areas that are separately fenced.

The Alternate Project area is designed for approximately 127,752 individual photovoltaic panels with a total DC generating capacity of 53.7 MW which, for a designed 1.44 DC-to-AC ratio, is enough capacity to meet a nameplate generation of 37.25 MW of AC power, which is 25 percent that of the Primary. The total number of panels within this area cover a total 194.2 acres. When the panels are in their horizontal position in the tracking system, the panels cover approximately 33.5 acres of this total area. The Alternate Project area includes three panel array areas that are separately fenced.

The Optional Project area is designed for approximately 87,720 individual photovoltaic panels with a total DC generating capacity of 36.8 MW which, for a designed 1.40 DC-to-AC ratio, is enough capacity to meet a nameplate generation of 26.25 MW of AC power. The total number of panels within this area cover a total 133 acres. When the panels are in their horizontal position in the tracking system, the panels cover approximately 23 acres of this total area The Optional Project area includes one panel array areas that is separately fenced.

1.1.2 Provide a general map showing the location of the Project Area, nearest communities, townships, and major roads. Include an inset map showing where the Project is located in the state. Scale should be appropriate for showing communities within at least 10 miles of the Project Area boundary.

Figure 1.1.2 provided in Appendix A depicts the general Project location within the state. and Figure 4.1.1 shows the total Project area with an aerial photography basemap. Figure 4.1.2 is a detailed mapbook of the proposed Project facilities.

1.2 OWNERSHIP

The applicant is Badger State Solar, LLC, which will own and operate the Project. Badger State Solar, LLC, a Delaware limited liability company, is controlled by D.E. Shaw Renewable Investments, L.L.C. (DESRI), a Delaware limited liability company.

DESRI and its affiliates acquire, own, and manage long-term contracted renewable energy assets in North America. DESRI's portfolio of renewable energy projects currently includes 31 wind and solar

projects that represent more than 1,600 MW of aggregate capacity. DESRI is a member of the D. E. Shaw group, a global investment and technology development firm with more than $50 billion in investment and committed capital as of December 1, 2018 and is headquartered in the US.

Ranger Power LLC develops the project on behalf of Badger State Solar, LLC. Ranger Power is a utility-scale solar development company focused on bringing cost-effective clean renewable energy projects and jobs to the Midwest region. Ranger Power's team of experienced developers and renewable energy specialists have successfully developed early-, mid-, and late-stage solar projects throughout the country. Collectively, the Ranger Power team has worked on over 3,500 MW of renewable energy projects and currently has approximately 3 GW under development.

1.3 PROJECT NEED/PURPOSE

1.3.1 through 1.3.5

These sections are omitted as they only apply to utility sponsored projects.

1.3.6 Energy Agreements

1.3.6.1 Identify all Wisconsin utilities under contract for delivery of energy from the proposed project.

There are no Wisconsin public utilities under contract for delivery of energy from the proposed project. Badger State Solar has executed a power purchase agreement ("PPA") with Dairyland Power Cooperative for the entire output of the Project. The term of the PPA is thirty (30) years.

1.3.6.2 For each utility under contract or with which an agreement in principle for delivery of energy is in place provide the following, by utility:

1.3.6.2.1. Rated capacity under contract.
1.3.6.2.2. Annual energy to be delivered under contract or expected to be delivered.

This Section Addresses Section 1.3.6.2.1, Rated Capacity Under Contract, and 1.3.6.2.2, Annual Energy to be Delivered Under Contract or Expected to be Delivered. As discussed above, the Project's entire 149 MW AC output will be sold to Dairyland Power Cooperative under a PPA. There is no rated capacity or energy to be delivered to a public utility.

1.4 ALTERNATIVES

Badger State, as a private developer, is continually seeking and evaluating prospective areas for solar energy development in Wisconsin and the Midwest. Section 1.4.2 describes the process used to evaluate and prioritize potential areas for development. Badger State considered brownfield as well as greenfield sites. However, the proposed project requires over 1,000 acres of nearly contiguous developable land in close proximity to existing transmission facilities. There were no brownfield sites identified in Wisconsin that meet the siting requirements.

Badger State considered potential areas throughout the state of Wisconsin and used the factors in Section 1.4.2.2.to select the area evaluated for the Badger State Project which encompasses approximately 5,000 acres all within proximity to the proposed point of interconnection to the grid at the American Transmission Company Jefferson substation located near the intersection of State Trunk Highway 89 and United States Highway 18. The total acreage of the facility proposed within this application was evaluated based on topography, environmental concerns, land rights, proximity to the point of interconnection, and willing landowner participation as further discussed in Section 1.5.1.

1.4.1 Supply Alternatives: Utilities Only

This section is omitted because it only applies to public utility sponsored projects.

1.4.2 Project Area Selection

1.4.2.1 Alternative Project Areas - Describe the project area screening and selection process used to select the proposed project area. Provide the following:

1.4.2.1.1. List individual factors or site characteristics used in project area selection

1.4.2.1.2. Explain how individual factors and project area characteristics were weighted for your analysis and why specific weights were chosen

1.4.2.1.3. Provide a list of all project areas reviewed with weighted scores for each siting factor or characteristic used in the analysis

1.4.2.2 Provide a narrative describing why the proposed project area was chosen.

This section addresses the requirements of Section 1.4.2 of that Application Filing Requirements, including all subsections, i.e., 1.4.2.1 through 1.4.2.2.

Ranger is a developer of large utility-scale solar farms. Its projects typically range from 75MW to 200MW, with some as large as 400MW. Ranger seeks solar development opportunities throughout Wisconsin and the Midwest.

The process that Badger State follows in finding and evaluating potential project sites varies; however, the elements described below are fundamental to the process and were used in Badger State's review of potential areas in the state of Wisconsin.

Phase I
The first phase of assessment eliminates areas of poor resource or other siting flaws as described below.

- Transmission and Injection Capacity – nearby electric transmission infrastructure is necessary to connect a project to the power grid. A project substation and additional transmission lines are often necessary, however the cost required to connect a project to the grid increases with the distance over which project-specific transmission must be built.
- Land availability – Large open areas are necessary for utility-scale solar facilities. Cities, suburbs and areas of active residential development are eliminated in the first phase of the search for an eventual project site.

Phase II

The second phase of assessment is a more focused evaluation of areas identified as feasible in Phase I.

- Land use – large tracts of open land must be available to support the responsible siting of solar panels. Agricultural land is ideally suited for solar farms.
- Community – Badger State values working with communities that welcome solar projects and responsible economic development opportunities.
- Potential host landowners – Prospective landowners are visited to gauge interest in hosting project facilities.
- Environmental concerns – A site suitability tool was run to screen for environmental factors including, but not limited to, wetlands, waterways, trees, critical habitat, endangered species and animals, and hydric soils. The Project areas selected showed few environmental factors, and, those factors identified can be avoided by placement of the solar PV array.
- Cultural and Historic Resources - Archaeological, cultural, and historical resources were considered during the site selection and Project design. The areas selected will not impact known archaeological, cultural, or historical resources.
- Constructability – Topography (elevation and slope), as well as soils and subsurface geology are reviewed at a desktop level. Detailed field analyses are performed later in the development process.
- Road infrastructure – Highways and roads within the proposed project area are reviewed for compatibility with large construction vehicles and delivery trucks. Main highways feeding into the area from major ports or rails are also considered for delivery of panels and other components.

The evaluation that led to the final site selection was a mix of both quantitative and qualitative functions described above.

Phase III

The final phase of preliminary site assessment often overlaps with the tasks outlined in Phase II. Land owner commitments are signed. Resource assessments, feasibility, suitability and environmental reviews are performed in the field. These activities are discussed in detail in Section 1.5 below.

Ranger identified the Midwestern US as a promising potential market for solar farms in 2016, due to the low penetration of such facilities to date. One of the most significant factors enabling solar development in this region has been the dramatic decline in the cost of large solar systems, due to a combination of improving technology, equipment and installation methods. Wisconsin has been of particular interest since it did not have any solar projects of Badger State Solar's size, where economies of scale make the project cost competitive with traditional forms of energy generation.

The Proposed Project Area was identified following a rigorous analysis of three key factors: the existing transmission grid in Wisconsin, the suitability of available land, and the receptiveness of the community.

- With respect to the grid analysis, Ranger looks for injection points where the existing electrical infrastructure is robust. This way, Ranger minimizes the interconnection facility costs and network upgrades frequently attributed to new generating facilities. In addition, Ranger prioritizes

projects where land is available adjacent to the point of interconnection, to minimize the length of high voltage transmission generation tie lines and the number of structures that support them. At Badger State Solar, the projected network upgrade costs are less than $5M, and project substation will be located less than 435 feet from the existing utility owned substation, minimizing the need for additional high voltage infrastructure.

- With respect to suitability of available land, solar farms are best sited on tracts that are relatively flat or with a slight southern incline. The use of cleared land minimizes impacts from shading and the need to remove trees. It also significantly reduces the likelihood that sensitive flora or fauna inhabit the area.
- With respect to receptiveness of the community, Ranger places great importance on community-supported projects. In order to be a good neighbor, it is important that the project start on the right foot by being transparent and being in constant communication with the public. The Ranger team engages local landowners, neighboring landowners, municipal leaders, and state legislators early on in its development process. Jefferson and Oakland Townships and Jefferson County expressed positive feedback after the Project was announced. In addition, neighboring Jefferson City has a history of supporting renewable energy generation, as it hosts the 1 MW project, owned by Half Moon Ventures.

The area ultimately selected and evaluated for the Badger State Project encompassed approximately 5,000 acres all within proximity to the proposed point of interconnection to the grid at the American Transmission Company Jefferson substation located near the intersection of State Trunk Highway 89 and United States Highway 18. The total acreage of the facility proposed within this application was evaluated based on topography, environmental concerns, land rights, proximity to the point of interconnection, and willing landowner participation.

1.5 PANEL SITE SELECTION

1.5.1 List the Individual Factors or Characteristics Used to Select the Proposed and Alternative Panel Sites

Badger State, along with its consultant Stantec evaluated each of the participating landowner's properties for siting potential. (For purposes of evaluation, a participating landowner is one that receives financial compensation for allowing use of their land for the Project.) The evaluation process was performed with the use of a Geographic Information System ("GIS") allowing the consideration and iterative analysis of many factors. This process included, but was not limited to, the following:

- Landowner control – after obtaining final leases and agreements, the Project footprint was established, and a preliminary assessment of possible sites based on environmental and topographical considerations was performed.
- Setbacks – Setbacks from public ROWs, utilities and sensitive community resources were established and mapped. No sensitive community resources such as churches, schools or nursing homes are located within a 1.5-mile radius of the project.
- Unavailable or restricted land – Managed and public lands, conservancies, land under contracts such as Conservation Reserve Program ("CRP"), Managed Forest Law and

Farmland Preservation Agreements ("FPA") were reviewed and considered for restrictions. Neither CRP nor FPA contracts apply to lands within the Primary or Alternate Project Areas.

- Airport locations – Airports, airstrips and runways were assessed to verify sufficient distances existed from runways to Project facilities. The Fort Atkinson Municipal Airport is the nearest airport and is located approximately 2.6 miles southeast of the Project.
- Environmental review – a desktop environmental review was performed to identify preliminary solar panel locations which would minimize impacts.
- Sound – Sound analyses were performed; panel locations were adjusted to minimize impacts based on the model results. The sites selected are below the 50 dBA standard during daytime and 45 dBA in the evening.
- Constructability and collection – Construction restrictions due to factors such as slopes and soils were considered. Construction efficiency and costs were also evaluated. Construction equipment movement and the ability to network the collection system between solar panel array sites were additional considerations.
- Land owner preferences – Potential locations of panels and access roads were discussed with hosting landowners and their concerns and preferences were considered in the preliminary design. Badger State reserves the right to make minor changes in the field to accommodate unforeseen circumstances. Any such minor changes shall take into account the basic premise of setbacks, sound and shadow considerations that were used in modeling the current Project layout.

The steps described above were often repeated in an iterative process to arrive at a Project design that minimized impacts to the environment and landowners while maximizing the efficiency of the Project. The Alternative Project Area is viable and buildable; however, they may represent additional impacts to the environment or higher construction costs. These Alternative Project Areas will be utilized, should the permitting process or PSC review reveal that one or more sites in the Primary Project Areas are unacceptable, or if circumstances arise prior to construction that prohibit the use of a Primary Project Area location. Revisions to the panel layout design may also require revisions in cable routes, access roads, and possibly slight shifts in other panel locations.

1.5.2 Provide Information on How Solar Array Location Site Characteristics and Types of Panel Chosen Factored Into the Selection of the Final Site

The solar location site characteristics were considered as described in Sections 1.4.2 and 1.5.1. Solar PV is a mature, proven technology. The current design for the Project includes LONGi Solar Bifacial 365-Watt modules which have been modified to simulate a 420W maximum power output at Standard Test Conditions (STC), Power Electronics HEM-3000 inverters, and self-powered single-axis trackers provided by NEXTracker. For a 2022 in service date, the Project is expected to use products with similar electrical and physical characteristics that are readily available in the market at the time of purchase. Bifacial technology is expected to be the industry standard by 2022, and potentially as early as 2021.

Maintaining technological flexibility among high quality manufacturers allows Ranger to ensure the quality of the solar system while also offering attractive pricing. A final determination of technology providers will be made closer to the start of construction; it is anticipated the quality and performance of panels,

tracking, and inverters will continue to improve in the coming years. Securing this equipment will require at least 6-8 weeks for procurement and delivery, and up to 8 months for procurement and delivery of the step-up transformer. Only Tier I, highly financeable solar panel providers have been identified as potential suppliers for the Projects. Both Ranger and DESRI have extensive experience using a variety of tier-one PV panel manufacturers, inverters, and tracker systems. A representative list of preferred and potential equipment suppliers under consideration is provided below.

TABLE 1.5-1 PREFERRED AND POTENTIAL EQUIPMENT SUPPLIERS

Panels	Inverters	Trackers	SCADA
Hanwha Q Cells	**SMA**	**NEXTracker**	SOLV
LONGi	**Power Electronics**	**Array Technology Inc.**	
Trina	**TMEIC**	**Sunlink**	
Canadian Solar	**Huwei**	**Gamechange**	
First Solar		**Soltek**	
Jinko			
LG			
REC Solar			
SunPower			
JA Solar			
BYD			

1.5.3 Panel Setback Distances

1.5.3.1 Minimum setback from:

1.5.3.1.1. Residence

1.5.3.1.2. Property lines

1.5.3.1.3. Other buildings (e.g. animal barns, storage sheds)

1.5.3.1.4. Roads

This section addresses the requirements of Section 1.5.3.1 of the Application Filing Requirements, including all subsections, i.e., subsections 1.5.3.1.1 through 1.5.3.1.4.

The proposed Primary Project Area and Alternative Project Area for the Project were chosen conservatively using the design criteria outlined in Sections 1.5.1 and 1.5.2. The Project does not require any easements from non-participating residents to accommodate the setbacks utilized. Badger State has voluntarily established the following minimum setback distances for the Project. These setback distances at a minimum meet all applicable requirements under county and township ordinances or rules.

TABLE 1.5-1 DESIGN SETBACKS

Setback Description	Setback Distance
Residences	100 – setback from solar components
Property Lines (side and rear)	Minimum of 20-foot setback in the Agricultural Zoning District. No Setback at internal property lines.
Public Road ROW	Class B - 70' Setback from edge of Right-of-Way, or 140' Setback from Roadway Centerline, whichever is greater. Class D - 50' Setback from edge of Right-of-Way, or 85' Setback from Roadway Centerline, whichever is greater.
Drainage Ditches	20-foot setback from top of bank of ditch.
Potentially Navigable Waterways	75-foot Shoreland Zoning setback for structures
Overhead Communication and Electrical Lines (not including lines to individual houses or outbuildings)	20-foot setback to allow overhead line maintenance activities. [1]
Overhead Utility Service Lines (lines to individual houses or outbuildings)	Easement area

[1]Three overhead transmission lines are present within the project area 1.) extending west from the existing Sub-Station having a 235-foot-wide easement; 2.) extending south from the existing Sub-Station having a 185-foot-wide easement; and 3.) extending northeast from the existing Sub-Station having a 200-foot-wide easement.

1.5.3.2 Identify any sites where setback waivers are needed or have been executed.

No setback waivers are required.

1.5.3.3 Status of easement agreements:

1.5.3.3.1 Identify all easement agreement that have been signed

1.5.3.3.1 Identify all easement agreement that have not been signed and provide a short description of the status of negotiations

Table 1.5-2 provided below identifies all solar and transmission easement agreements that have been signed and those that are still in the process of negotiation.

TABLE 1.5-2 STATUS OF EASEMENT AND LEASE AGREEMENTS

Primary Owner Name	Parcel ID	Type	Status	Sum of Acreage
ANFANG PROPERTIES LLC	014-0614-0531-000	Solar Lease	Participating	39.57
	014-0614-0534-000	Solar Lease	Participating	39.08
	014-0614-0543-000	Solar Lease	Participating	47.73
	014-0614-0741-000	Solar Lease	Participating	39.42
	014-0614-0744-000	Solar Lease	Participating	39.66
	014-0614-0822-000	Solar Lease	Participating	35.86
	014-0614-0823-000	Solar Lease	Participating	37.34
	014-0614-0832-000	Solar Lease	Participating	44.44
	014-0614-0833-000	Solar Lease	Participating	20.29

Primary Owner Name	Parcel ID	Type	Status	Sum of Acreage
	014-0614-1811-000	Solar Lease	Participating	29.24
	014-0614-1811-001	Solar Lease	Participating	10.12
BARNES, SHEILA I	014-0614-1814-000	Solar Lease	Participating	17.06
DJ SCHROEDL FARMS INC	014-0614-0842-001	Solar Lease	Participating	25.62
	014-0614-0843-000	Solar Lease	Participating	40.18
	014-0614-0844-000	Solar Lease	Participating	38.70
HEIDEMAN TRUST, ROGER J	014-0614-0611-001	Solar Lease	Participating	10.52
HEIDEMAN, GREGGORY	014-0614-0611-000	Solar Lease	Participating	28.47
HIDDINGEMEEDEN TRUST	022-0613-1113-000	Solar Lease	Participating	39.08
	022-0613-1114-000	Solar Lease	Participating	37.94
	022-0613-1141-000	Solar Lease	Participating	41.73
	022-0613-1142-000	Solar Lease	Participating	41.87
	022-0613-1143-000	Solar Lease	Participating	39.00
	022-0613-1144-000	Solar Lease	Participating	41.97
	022-0613-1222-001	Solar Lease	Participating	0.96
	022-0613-1223-001	Solar Lease	Participating	17.89
	022-0613-1231-000	Solar Lease	Participating	40.49
	022-0613-1232-000	Solar Lease	Participating	39.74
KOCH TRUST, JAMES	014-0614-1813-000	Solar Lease	Participating	28.07
KOCH TRUST, JAMES A	014-0614-0734-001	Solar Lease	Participating	4.22
	014-0614-0743-001	Solar Lease	Participating	15.99
	014-0614-1812-000	Solar Lease	Participating	39.00
	014-0614-1821-000	Solar Lease	Participating	32.14
	014-0614-1823-000	Solar Lease	Participating	18.45
KOPLING TRUST, VERNALEE J	022-0613-1212-000	Solar Lease	Participating	25.06
	022-0613-1213-000	Solar Lease	Participating	19.79
	022-0613-1224-000	Solar Lease	Participating	37.43
LENZ TRUST, ROSEMARIE	014-0614-0612-000	Protected Area	Participating	2.34
		Solar Lease	Participating	36.93
	014-0614-0621-000	Protected Area	Participating	0.72
		Solar Lease	Participating	38.31
	014-0614-0622-000	Limited Area	Participating	0.26
		Solar Lease	Participating	7.19
LUNDE, GARY N	014-0614-0714-000	Solar Lease	Participating	40.03
PITZNER TRUST, CYNTHIA	014-0614-0513-000	Solar Lease	Participating	19.24
	014-0614-0514-000	Solar Lease	Participating	36.77
	014-0614-0523-000	Solar Lease	Participating	39.14
	014-0614-0524-000	Solar Lease	Participating	39.73

Primary Owner Name	Parcel ID	Type	Status	Sum of Acreage
	014-0614-0532-000	Solar Lease	Participating	39.33
	014-0614-0641-000	Solar Lease	Participating	20.08
	014-0614-0712-000	Solar Lease	Participating	9.37
	014-0614-0712-001	Solar Lease	Participating	9.28
	014-0614-0712-002	Solar Lease	Participating	19.22
	014-0614-0713-000	Solar Lease	Participating	19.95
	014-0614-0713-001	Solar Lease	Participating	20.62
	014-0614-0721-000	Solar Lease	Participating	12.34
	014-0614-0724-000	Solar Lease	Participating	12.45
	022-0613-1241-001	Solar Lease	Participating	34.48
	022-0613-1241-002	Solar Lease	Participating	1.06
	022-0613-1242-000	Solar Lease	Participating	39.93
REICHERT, TRACY W	022-0613-1213-001	Solar Lease	Participating	19.47
	022-0613-1214-002	Exclusion Area	Participating	0.48
		Solar Lease	Participating	8.61
SCHROEDER, DAVID G	014-0614-0831-000	Transmission Easement 1	Negotiating	8.59
	014-0614-0842-000	Transmission Easement 1	Negotiating	0.98
SCHROEDL, KENNETH J	014-0614-0522-000	Transmission Easement 3	Participating	0.23
SCHULTZ TRUST, RICHARD A	014-0614-0723-004	Transmission Easement 2	Participating	2.30
		Transfer to Pitzner, not yet official	Participating	8.33
STILLING, DENNIS J	014-0614-1712-000	Solar Lease	Participating	40.51
	014-0614-1713-000	Solar Lease	Participating	33.93
VOELTZ, DONALD	014-0614-1711-002	Solar Lease	Participating	25.04

1.6 COST

This section is omitted as it is only applicable to public utility sponsored projects.

1.7 MISO AND PROJECT LIFE SPAN

1.7.1 MISO market - Describe how, at the time of this filing, the proposed facility will be treated as an intermittent resource in the MISO market.

In June 2017, Badger State filed an Interconnection Request with the Midcontinent Independent System Operator (MISO). The Project was assigned queue position, J818 and is part of the August 2017 MISO Definitive Planning Phase Cycle (DPP). In its application, Badger State requested full Network Resource Interconnection Service for 149MW nameplate capacity of the facility.

Solar PV projects in MISO receive the class average of 50% for its Initial Planning Year until they can demonstrate 3-years of operational history. Thereafter, their capacity value is determined based on a 3-year historical average output of the resource for peak hours during the summer months.

The Project is currently being evaluated through the System Impact Study process and has completed Phase 1 and Phase 2. The final Phase 3 study report is expected in August 2019. It is expected that MISO will tender a Large Generator Interconnection Agreement (LGIA) to the Project in December 2019, which will be executed by March 2020.

1.7.2 Provide an Estimate of Expected Project Life Span for the Solar Plant

The design life for the Project is approximately 30-35 years. All lease agreements have been negotiated to allow for that term of operation. Badger understands that the value of a solar farm lies in its operation and anticipates a premium level of operation and maintenance service throughout its life. Solar PV is subject to light-induced degradation, with annual production levels declining by 0.5 to 0.7 percent. With this level of maintenance Badger expects that the operating condition of the panels in 35 years will be approximately 75 percent of the first year of operation. Based upon the needs of the marketplace, the community, the landowners, and Badger, it is anticipated there will be an opportunity to extend the Project life beyond 35 years. The lease agreements would allow for an operating period of 40 years – an extension beyond 40 years would require approval from landowners.

1.7.3 Describe How the Facility will be Decommissioned at the End of Life Span

Badger State is not aware of any current or previous decommissioning actions at current 100 MW (or greater) Solar energy generating facilities that can be referenced here.

The Project will operate for at least 30 years and the useful life of the Project may be 35 or 40 years based on current forecasts for modern equipment. At the end of the Project's useful life, Badger State will assess whether to cease operations and decommission the Project or to replace equipment and attempt to extend the life of the Project. In general, the majority of decommissioned equipment and materials will be recycled. Materials that cannot be recycled with be disposed of at approved facilities.

At the end of the Project's useful life, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored to its preconstruction condition or returned to farm production. Decommissioning activities will require approximately 12 months to complete. In general, decommissioning activities would include:

1. Dismantling and removal of all above ground equipment (solar panels, racking, transformers, Project Substation, etc.);
2. Excavation and removal of all above ground cabling;
3. Removal of foundations (piles, piers and posts);
4. Underground cables will be removed based on agreed upon conditions reached with the landowner and codified in the lease; and
5. Scarification of compacted areas within and contiguous to the solar facility (including but not limited to internal and external access roadways).

For the gen-tie line, telecommunication lines, and collector substation dismantling would proceed according to four general stages: (1) dismantling and demolishing above ground structures; (2) removal of concrete foundations; (3) excavation and removal of soils and broken concrete from the site; and (4) surface contouring to return the disturbed areas to near-original conditions.

If the facility is to be returned to a condition suitable for agricultural production upon the completion of its decommissioning, the land will be tilled to break up the vegetation cover that has been established for the Project. The vegetation layer within the Project area will consist of a mixture of areas where prairie plantings and non-native vegetation covers have been maintained. The use of deeply rooted native prairie vegetation and the "resting" of soil either under this or a non-native cover has been well documented to provide benefits and improvement to soil health. The benefits to soil health associated with the vegetation cover established for the Badger Solar facility are comparable to the benefits received from that of the Natural Resources Conservation Reserve Program. This governmental program has well documented benefits of these types of plantings to decreased soil erosion, increased water quality, increased soil health and tilth which all add to increased crop and fiber production from the land. With the ground surface of the Badger Solar facility being maintained with these vegetative covers, an increase to overall crop and fiber production, once it is returned to agricultural use, can be expected. Because of this, no additions of topsoil, macro or micro nutrients to the soil are anticipated to return the soil within the Project area to agricultural production once the facility is decommissioned.

1.7.3.1 Provide an estimate of the cost of and source of funding for decommissioning

Badger State will be responsible for decommissioning the Project and associated facilities. Badger State has included an obligation to decommission the Project components in the Project's solar lease and easement agreements with participating landowners. Because of the uncertainty in predicting the value of equipment reuse and salvage and consistent with recent PSCW determinations in the matter, Badger State will create a decommissioning plan at the 15th anniversary of the commencement of operations. At that time Badger Hollow will post a form of financial security, such as a surety bond, letter of credit, escrow account, reserve fund, parent guarantee or other suitable financial mechanism, if any net cost of decommissioning exists.

1.8 REGULATORY PERMITS AND APPROVALS

1.8.1 Approvals and Permits

For each of the regulatory agencies listed below provide the following information:

- ***regulatory agency***
- ***the approvals/permits required,***
- ***application filing date,***
- ***the status of each application,***
- ***agency contact name and telephone number:***

1.8.1.1 Federal

1.8.1.1.1. Federal Aviation Administration (FAA)
1.8.1.1.2. US Army Corps of Engineers (USACE)
1.8.1.1.3. US Fish and Wildlife Service (USFWS)
1.8.1.1.4. Other federal agencies not listed above

1.8.1.2 State

1.8.1.2.1. Department of Transportation (DOT)
1.8.1.2.2. Department of Natural Resources (DNR)
1.8.1.2.3. Other state agencies not listed above
1.8.1.3. Local Permits – including county, town, city, and village

The expected permit requirements for construction and operation of the proposed Project are listed in Table 1.8.1. The regulatory agency and trigger for the permit requirement are also listed.

Table 1.8-1 summarizes the permits and approval types that are required at the federal, state and local level for the Project. Badger State is in contact with Jefferson County and will update the list if additional requirements are identified. The necessary permits and approvals will be obtained before commencing construction activities.

TABLE 1.8.1-1 PERMITS, NOTICES, CONSULTATIONS AND APPROVALS

Agency	Interest or Permit	Contact	Application/ Notice Date	Status
Federal				
USFWS	Coordination on Endangered Species Act, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act	Andrew Horton (952) 252-0092 x208	Anticipated Q3, 2019	
USACE	Section 404 of the Clean Water Act	Marie Kopka (262) 641-5498	Anticipated Q3, 2019	
State				
PSCW	CPCN for construction of large energy generation facility	Jim Lepinski (608) 266-0478	Q2, 2019	
WDNR	Section 401 of the CWA, Water Quality Certification and State-Regulated Wetlands (Isolated Wetland Permit)	Lindsay Tekler (608) 535-2602	Q2, 2019	
WDNR	Wisconsin Pollutant Discharge Elimination System (WPDES)/ Stormwater Runoff Permit (NR216)	Kim Gonzalez (608) 267-2759	Q2, 2019	
WDNR	Wisconsin Navigable Waters, Harbors and Navigation (Chapter 30)	Lindsay Tekler (608) 535-2602	Q2, 2019	
WDNR	Wisconsin Endangered Species Law (s. 29.604, Wis. Stats.)	Stacy Rowe (608) 266-7012	1/23/2019	Coordination Completed

Agency	Interest or Permit	Contact	Application/ Notice Date	Status
Wisconsin State Historical Society Historic Preservation Office	Cultural Resources (historical and archaeological) under Section 106 of the National Historic Preservation Act	Chip Brown (608) 264-6508	Anticipated Q3, 2019	
Wisconsin Department of Transportation (WisDOT)	Heavy and oversized load permits	Bob Fasick (920) 492-0148	Anticipated Q3, 2019	
WisDOT	Utility Permit for boring Electric Line under United States Highway (USH) 18 and State Trunk Highway (STH) 89	Bob Fasick (920) 492-0148	Anticipated Q3, 2019	
WisDOT	Access (Driveway) Permit for each temporary and permanent access point (driveway) along United States Highway (USH) 18 and State Trunk Highway (STH) 89	Bob Fasick (920) 492-0148	Anticipated Q3, 2019	
Local				
Jefferson County	Zoning and Land Use Permit for work in Shoreland Zone – Co. Zoning Ordinance No. 11 (Shoreland Provisions 11.10) -	Matthew Zangl 920-674-7130	Anticipated Q3, 2019	
Jefferson County	Heavy and oversized load permits	Brian Udovich (920)-674-7273	Anticipated Q3, 2019	
Jefferson County	Utility Permit for boring Electric Line under County Trunk Highway (CTH) G	Brian Udovich (920)-674-7273	Anticipated Q3, 2019	
Jefferson County	Joint Development Agreement	Ben Wehmeier (92) 674-7101	Anticipated Q3, 2019	
Town of Jefferson	Driveway permits (various)	Tina Barnes (920) 674-5073	Anticipated Q3, 2019	
Town of Oakland	Driveway permits (various)	Chris Astrella (608) 423-9635	Anticipated Q3, 2019	

1.8.2 Correspondence with Permitting Agencies - Provide copies of correspondence to and from state and federal agencies that relate to permit approval, compliance approval, or project planning and siting. Provide copies of any correspondence to or from local governments. This should continue after submittal of the application.

Copies of correspondence with applicable permitting agencies are provided in Appendix C. Badger State will continue to provide copies of agency correspondence to the PSC, following submittal of this application.

2.0 TECHNICAL DESCRIPTION, PROJECT AREA, PANEL AND PANEL SITES, AND ANCILLARY FACILITIES

2.1 ESTIMATED SOLAR RESOURCE AND PROJECTED ENERGY PRODUCTION

- ***Provide a complete solar resource and energy production assessment for the Project. This report should include, at a minimum:***

2.1.1 Solar Data Used In Analysis

To evaluate the solar energy resource for the Project, meteorological data from the Meteonorm database was used. This data was compiled utilizing local ground measurement data over a 20-year period with supplemental information obtained via satellites to fill in any gaps (approximately 8 percent for this case). This solar irradiance and climate information was then used to simulate a typical full year of production with the photovoltaic systems software (PVSYST) analysis program.

2.1.2 Monthly and annual typical solar irradiance

Below is a summary of the available solar energy throughout the year.

TABLE 2.1-1 GLOBAL HORIZONTAL IRRADIANCE

Global Horizontal Irradiance (GHI) on PV Plane (kWh/m^2)												
Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
72.3	99.9	143.5	178.3	217.3	234.4	245.6	207.5	172.4	118.2	66.9	60.1	1816.4

2.1.3 Gross and Net Capacity Factor (explain the method used to calculate the capacity factors and provide the data used)

While the maximum output of the solar farm will be 149MW AC at the point of connection, its output may be less at any given time depending on the available energy available from the sun. The software program PVSYST was used to simulate the energy conversion process using model files from the PV module and inverter manufacturer, historical weather data as discussed in section 2.1.1, and the parameters that apply to the solar farm.

The system consists of an installed DC power capacity of approximately 180 MW to 205 MW. These values will be confirmed once the final layout and generation equipment are determined. The gross and net capacity factors for the Badger State solar farm are calculated to be 30 percent and 26 percent, respectively when comparing the nameplate rating to the energy forecasted from the PVSYST model.

2.1.4 Estimated Energy Production of Project

2.1.4.1 Estimated production losses

Energy losses within the system include electrical losses in the AC and DC electrical collector system, energy conversion losses within the PV inverters, step-up transformers and various other equipment, as well as losses due to soiling of the PV modules themselves due to dust, debris and snow cover. Taking those factors into account, a reasonable estimate of energy losses ranges from 15 to 20 percent of the maximum output, which is consistent with industry-wide estimates.

2.1.4.2 Estimated net energy production

The estimated net annual energy production is between approximately 260,000 and 320,000 megawatt hours. Annual energy production output will depend on final design, site specific features, and annual variability in the solar resource.

2.2 PANEL TYPE AND PANEL CHARACTERISTICS

2.2.1 Identify the Manufacturer and Model of Solar Panel to be Used.

- ***(If no Panel Purchase Agreement has been signed, applicants should identify the panel or panels being considered. It is acceptable to identify a range by providing information on the largest and smallest panel being considered, however, consult with Commission staff prior to preparing the application.)***

Solar panel technology is continually making advancements in both manufacturing and efficiency and is subject to commodity pricing based on the current market demand and available stock. The final PV module selection therefore cannot be made until a time at which detailed engineering is completed and ordering of the PV modules is possible. For this reason, the preliminary engineering provided in this submission has been completed using an assumed silicon crystalline PV module with a 420-watt(W) DC power output at standard test conditions (STC) for the purposes of quantifying the proposed energy output. We believe that this is a realistic estimation of the available offering at the time of Project construction.

As noted above, the modules considered have a 420W DC output for energy forecast purposes but may range anywhere from the current market offering of 380W, or beyond the 420W output at the time of construction. A representative 385W module is provided in Appendix B which has similar physical and electrical characteristics.

At the time of construction several PV module offerings from different suppliers including Canadian Solar, Hanwha Qcells, JA Solar, Jinko, Longi, Risen, SunPower, and Trina will be evaluated, and a selection will be made based on the most cost-effective option. The technologies that may be considered are polycrystalline, monocrystalline and bi-facial PV modules, and the final supply of modules may contain a mix of several similar wattages.

Bi-facial PV modules are similar to traditional glass plate modules but have the added benefit of collecting solar energy which strikes the back of the PV module due to reflection from the ground and adjacent

modules and trackers. This technology has been considered within the conceptual design presented in this application and will be specifically evaluated at the time of module selection as they allow increased energy production for the same solar irradiance when compared to traditional, non-bifacial modules by as much as 30 percent. This may allow the Project to have the same installed generation capacity with a reduced footprint or have an increased output while maintaining the same footprint. The bi-facial modules will also represent and increased per watt PV module cost and therefore will need to be evaluated.

2.2.2 Panel Delivery Date - Indicate whether this is a firm date.

Panel deliveries are expected to occur between March and September of 2021.

2.2.3 Total Number of Panels Required for Project

The Primary Project area is designed for approximately 487,848 panels with a generating capacity of 180 MW to 204.9 MW. Based on the module wattages under consideration and the PV tracker system selected, the final count could range from approximately 450,000 to 550,000. The full Project nameplate capacity of 149 MW AC can be achieved with the single axis tracking systems for the site.

2.2.4 Technical Characteristics of Panels

The PV module selected for the Badger State Project will have approximately 72-cells and will be a plate glass module with an aluminum frame with approximate dimensions of one meter by two meters. The PV modules will be connected in series for up to 1500V operation and will be mounted on a tracker system in-line in landscape orientation on racking which tracks east to west to follow the sun throughout the day.

Currently the 420W rated PV module which has been used for the conceptual design is not available in the market and therefore, no specification sheet is available at this time. A representative 385W module datasheet which has similar physical construction and electrical characteristics to the 420W module was used in the current design and is provided in Appendix B.

2.2.4.1 Through 2.2.4.7 Technical Characteristics of Turbines

These Sections 2.2.4.1 through 2.2.4.7 are only applicable to wind farms and are not applicable to this Project.

2.2.4.8 Physical Dimensions

A scaled drawing of a 385W panel (Jinko Eagle) which will have similar physical dimensions to the 420W module used for the conceptual design and is the anticipated final PV module to be selected for this Project is provided in Appendix B. The example 385W panel is 1.99 meter by 0.99 meter and is 40 mm in width. Another similar panel is the Longi-Solar 385W which also is a 72-cell panel and is 2.02 meter by 0.99 meter and is 30 mm in width. All 72-cell PV modules that would be considered at this time generally conform to the nominal dimensions of 2m long by 1m wide.

2.2.4.9 Panel Power Curve (provide actual data – solar resource and rated output needed to create the curve)

As noted in Section 2.2.4 above, a datasheet including power curve data for a representative 385W module is provided in Appendix B. While the 385W output is lower than the 420W model, the underlying technology is expected to remain the same and the output curves will be similar.

2.2.5 Technical Characteristics of Panel Supports

2.2.5.1 Type of Material Used

The racking and tracker supports are made of galvanized and stainless steel.

2.2.5.2 Support Dimensions and Number of Sections Required

The solar panels will be mounted on a steel racking frame that is positioned three to seven feet from the finished ground with a +\- 60-degree range of motion (single axis tracking) driven by electric motors. The single axis tracking system is anticipated to be mounted on support posts driven or screwed into the ground with steel piles or helical piles. The horizontal tracker would be in its highest position during the morning and evening hours when the trackers are tilted at their maximum angle and would be a maximum of 10 to 12 feet above the ground surface. The bottom edge of the modules will be a minimum of one foot above grade at maximum tilt, and up to four feet above grade when tilted flat at mid-day.

In summary:

- Approximate height of tracker rotation shaft – 3 to 7 feet.
- Minimum tracker height (module edge to ground at maximum tilt) – 2 to 4 feet.
- Maximum tracker height (module edge to ground at maximum tilt) – 10 to 12 feet.
- Range of tracking angle - +/-60 degrees.

The variability in height is due to the panel configuration on the racking system. Some systems are designed with panels in a single portrait configuration with a single row of panels arranged in a portrait configuration relative to a viewer east or west of the row. The long axis of the panels would be perpendicular to the axis of the tracking system. The panels would be approximately four feet above grade when tilted flat at mid-day in this design. A racking system with a two-portrait design may also be selected. This system holds two panels in portrait configuration with an axis that is perpendicular to the tracker. The two-portrait configuration requires taller piles and results in a taller overall system, but also provides for wider aisles. Racking system design will be selected prior to construction.

In the case of extreme weather conditions, Badger State has reviewed the closest weather station's climate history, as verified by the Solar America Board for Codes and Standards. Potential tracking technologies will be assessed in the context of other project attributes, such as resource forecast and expected operating profile. The final selection could assume an operating scenario where equipment can operate in the most extreme heat and cold, or potentially pause tracking operation until these conditions pass.

The complete tracker system will be arranged into rows of individual trackers with an estimated length of 250 feet by seven feet (when panels are horizontal) with gaps placed between sections or groups of sections to allow for maintenance personnel to access the whole site. The piles will run north to south along the row to support each section of the steel structure and will likely include an integrated cable management solution in order to support the insulated copper DC string cabling which interconnects each of the PV modules. The quantity estimate for piles is provided in Table 2.2-1 including Primary, Alternate and Optional Project areas from the conceptual layout.

TABLE 2.2-1 QUANTITY ESTIMATE FOR PILES

Project Area	Tracker Type	Quantity	Piles/Tracker	Total Piles
Primary	Full Tracker	5,677	10	56,770
	Part Tracker	1,648	7	11,536
	Total	**7,325**	**-**	**63,306**
Alternative	Full Tracker	1,541	10	15,410
	Part Tracker	350	7	2,450
	Total	**1,891**	**-**	**17,860**
Optional	Full Tracker	1,135	10	11,350
	Part Tracker	125	7	875
	Total	**1,260**	**-**	**12,225**

These solar trackers are currently expected to be self-powered, however some tracker systems available require external power to be bought from an auxiliary power source.

2.2.6 Scale Drawings of Panels Including Pad and Transformer

As noted in Section 2.2.1, the final selection of the PV module and inverters will be made at a future date based on the current market offering. A scaled drawing of a 385W panel which will have similar physical construction to the 420W module used for the conceptual design and is the anticipated final PV module selected for this Project is provided in Appendix B. A manufacture specification sheet of an inverter which is used for the basis of the preliminary Project design is also provided in Appendix B.

2.3 CONSTRUCTION EQUIPMENT AND DELIVERY VEHICLES

2.3.1 Types of Construction Equipment and Delivery Vehicles

Construction equipment will include the following: graders, bulldozers, excavators, forklifts, trailers, plows, trenchers, pile drivers and directional boring rigs. It is anticipated that most equipment will be initially delivered to the Project temporary laydown areas. Equipment will be transported from the laydown yard to the appropriate construction site, as needed.

Additional deliveries of construction materials and components will be made directly to the construction sites. The materials and delivery vehicles include the following:

- Culvert sections and road fabric (flatbed semis);
- Reinforced steel for foundation, anchor bolts and padmount transformers (flatbed semis);

- Ready-mixed concrete at the substation only (traditional ready-mix trucks);
- Large equipment and main substation main transformer (heavy/oversize load tractor trailers); and
- Fiber optic spools, electrical cable and electrical conductors (lowboy or flatbed semis).

2.3.2 Gross Vehicle Weight for All Vehicles Using Local Roads

Vehicles used for transporting Project components will consist of legal load (80,000lb or less) over-the-road flatbed and box trucks, other than the oversize load delivery vehicles for the main step-up transformer for the Project substation.

The site will receive an average of approximately five to seven box trucks (modules) a day throughout the module delivery period and five to seven flatbed trucks a day (inverters, piles, racking, misc.) during the pile driving period. The shipping weight of the main transformer will be approximately 317,550 lb and may be transported via rail to the nearest railyard or via barge to the nearest port and then using special multi-axle trucking as necessary to the site.

If there becomes a need for a larger vehicle, Badger State's construction contractor will work with state and local authorities to obtain the applicable oversize-overweight permits.

2.3.3 For Vehicles Used for Panel and Equipment Delivery (diagrams or Drawings of Vehicles are Acceptable) Include:

2.3.3.1 Overall vehicle length

Except for the main power transformer, vehicles used for delivery will be standard over-the-road semitrucks and flatbed trailers.

2.3.3.2 Turning radius

The turning radius will be the radius for standard over-the-road semi-trucks.

2.3.3.3 Minimum ground clearance

The minimum ground clearance will be the clearance for standard over-the-road semi-trucks.

2.3.3.4 Maximum slope tolerance

The routes to the site are relatively flat, therefore, slope tolerance is not expected to be an issue.

2.3.4 Delivery Vehicle Configurations

As construction progresses, the solar panels and other equipment will generally be delivered directly to the installation locations in a standard over-the-road truck. Fork lifts are used to unload pallets from the truck and place the pallets throughout the site. Some equipment will be delivered to the laydown area and then distributed as needed.

2.3.5 Roads and Infrastructure

Stantec performed a preliminary review of the regional roads, bridges and intersections within the Project footprint as well as possible routing to the panel sites. Stantec also compiled data on public infrastructure from the WisDOT's Wisconsin Information System for Local Roads ("WISLR") and Highway Structures Inventory System ("HSIS") to evaluate the suitability of the infrastructure to support expected construction traffic.

At intersections along the possible route for panel construction activities, data was collected to determine the configuration. Additionally, roadway geometrics, type of roadway surfaces at the intersections, approximate ditch in-slopes, and culverts in the intersection area were logged.

The area roads are primarily hot-mix asphalt pavement (HMA). The roads serve the general traveling public, area agriculture industry traffic, and local vehicle traffic. No roads are posted for weight restrictions in the area. The "no posting" of roads suggests that the local road system has sufficient load bearing capacity and width to support the needs of the Project, however each possible route considered for delivery and transportation of construction materials will be evaluated individually for potential mitigation requirements prior to construction. To determine the sub-surface load bearing capacities of local roads, past maintenance requirements are often an accurate indicator of future performance.

In general, except for entrance/exit locations, haul vehicles that have axle and wheel loads similar to standard highway vehicles should not have an adverse impact on bridges and structures that have been designed for modern highway loadings. This would apply to State and County Trunk Highways and other major roadways that have been designed for and routinely carry this type of traffic. Also, this would apply to minor roads with newer structures designed in accordance with current codes. Driveway locations may reveal localized roadway deficiencies due to the increased stresses of vehicle braking, turning, and accelerating. Minor roads with older and smaller structures would require investigation and evaluation of individual structures.

2.3.5.1 DESCRIBE METHODS TO BE USED TO HANDLE HEAVY OR LARGE LOADS ON LOCAL ROADS

As described in Section 2.3.2, vehicles used for transporting Project components will consist of legal load (80,000lb or less) over-the-road flatbed and box trucks except for the delivery of the main step-up transformer for the Project substation. Badger State's construction contractor will work with state and local authorities to obtain the applicable oversize-overweight permits.

2.3.5.2 PROBABLE ROUTES FOR DELIVERY OF HEAVY AND OVERSIZED EQUIPMENT AND MATERIALS

The most suitable access route for vehicles arriving from the North will be via I-94 to STH 26. STH 26 avoids cross traffic and intersects with US 18 about 1 mile from the Project site. The most suitable access route for vehicles arriving from west of the Project site, via I-94, will also be to utilize STH 89 or STH 26 to the Project site. An alternate route, US 18, could be utilized from Madison; however, lower speeds and undivided roadway section may make US 18 a less-desired option.

The most suitable access route for vehicles arriving from south of the Project site will be I-90. Traffic from Northern Illinois (or the Beloit-Janesville area of Wisconsin) would have the option of exiting at STH 26 to access the Project area or using US 18. While US 18 would provide direct access to the Project site, STH 26 has the advantage of being a higher capacity, four-lane divided highway with access control to minimize cross traffic.

Final routes for equipment have not been chosen at this time although most loads will approach the Project area via STH 26 and STH 89 from the north or US 18 from the east or west. Although some highways are listed as ‘high-clearance’ or ‘oversize-over weight’, these ratings do not remove the requirement for application for a permit for a load which exceeds the standard limits for size and weight. Additionally, the lack of a ‘high-clearance’ or ‘oversize-over weight’ rating does not preclude a highway from use for loads which exceed state limits. Finally, temporary restrictions are placed on many roads during Spring thaw and Winter Frozen Road Period. The WisDOT Oversize-Overweight Permit section should be contacted for additional information when specific loads and routes are known.

2.3.5.3 POTENTIAL FOR ROAD DAMAGE AND COMPENSATION FOR SUCH DAMAGE

Road damage during the construction phase of the Project is unlikely. Vehicles used for transporting Project components will consist primarily of legal load over-the-road flatbed and box trucks. Prior to commencement of construction, a roadway condition survey of road conditions within the Project perimeter will be performed. If necessary, roads will be video-taped both before and after construction and assessed by an independent consultant acceptable to Badger State.

If direct damage results from the Project traffic loads, it will be repaired and returned to conditions mutually agreed upon by the affected jurisdictions as determined by the pre-construction survey. Alternatively, Badger State and the affected jurisdictions may agree on a rate of compensation directly caused by and related to the Project traffic. Deliveries to Project sites will be compliant with statutory heavy-haul axle loading requirements.

2.3.5.4 PROBABLE LOCATIONS WHERE LOCAL ROADS WOULD NEED TO BE MODIFIED, EXPANDED, OR REINFORCED IN ORDER TO ACCOMMODATE DELIVERY OFEQUIPMENT.

No modifications to local roads are expected except for the intersection of CTH J and Schroedl Lane. This undersized intersection may require expansion of turning radius in the northeast quadrant of the intersection to allow safe and efficient semi-trailer access.

2.3.5.5 INCLUDE AN ESTIMATE OF WHETHER OR NOT TREES NEAR OR IN ROAD ROW MIGHT NEED TO BE REMOVED.

Trees along equipment delivery routes will not require pruning to accommodate the large loads. Trimming or clearing of trees on participating owner's lands to accommodate equipment delivery is discussed and agreed upon prior to construction.

2.3.5.6 PROVIDE AN ESTIMATE OF LIKELY LOCATIONS WHERE LOCAL ELECTRIC DISTRIBUTION LINES WILL NEED TO BE DISCONNECTED IN ORDER TO ALLOW PASSAGE OF EQUIPMENT AND MATERIALS.

2.3.5.6.1 Describe how residents will be notified before local power would be cut.

It is not anticipated that local electric distribution lines will need to be disconnected during delivery of materials or installation of the facility. Therefore, no notifications will be required.

2.3.5.6.2 Estimate the typical duration of a power outage resulting from equipment or materials delivery.

No power outages are required for the delivery of equipment and materials.

2.3.6 Construction Traffic - Anticipated traffic congestion and how congestion will be managed, minimized or mitigated. Include:

Stantec performed a preliminary analysis of the regional roads, bridges and intersections within the Project area for possible routing to the panel sites and consideration of traffic impacts. The results of this study are discussed in further detail in Section 2.3.5. Figure 4.1.1 in Appendix A identifies the roads within the vicinity of the Project area.

2.3.6.1 List of roads most likely to be affected by construction and materials delivery.

Road use during construction for materials delivery will include STH 26, STH 89, US 18, CTH G, and CTH J. Section 2.3.5.2 discusses how each road will be used during the construction phase.

2.3.6.2 Duration of typical traffic disturbance and the time of day disturbances are most likely to occur.

The Project is in a rural area and thus general traffic congestion will be limited. During construction little to no interference with local traffic patterns is anticipated and closures of state, county or local town roads are not planned. Most of the work and transportation activities will occur during low volume and off-peak times. Signage will be posted during construction to notify local traffic of construction vehicles entering and exiting the roadway and presence of workers.

The first phase of construction will include delivery of earth-moving equipment and aggregate for the solar array access roads. Delivery trucks will bring steel posts, racks and solar modules, followed by equipment and personnel to install them. This will be followed by installation of the electrical system which will be installed by trenching equipment as described in Section 2.4.7.4.2. Construction activities will be conducted primarily during daylight hours, during off-peak times Monday through Friday. Smaller vehicles

for personnel arriving on-site may continue through later hours if needed to maintain the Project's construction schedule.

2.4 OTHER PROJECT FACILITIES

2.4.1 Foundations

- ***Describe the type of foundation or foundations to be used. If more than one type of foundation may be needed describe each and identify under what circumstances each foundation type would be used. Include the following:***

The Project will use driven pile foundations and, where needed based on geotechnical conditions, drilled or helical pile foundations may be used. The main power transformer will be installed on a concrete foundation.

2.4.1.1 Dimensions, surface area and depth required for each foundation.

Typical driven pile foundations are six-inches-wide by nine-foot steel sections with eight to 15 feet of embedment and a reveal height of two to five feet. If helical piles are needed, foundation dimensions will be determined in the detailed engineering phase. Typical drawings of driven and helical piles are provided in Appendix B.

The substation footprint will be approximately 280 ft by 195 ft with 55 ft by 33 ft of concrete for the main transformer foundation. The final design of the substation is yet to be determined. A typical substation foundation schematic is provided as an example in Appendix B.

2.4.1.2 Amount of soil excavated for each foundation type.

No excavation is required for driven pile foundations which is the primary foundation to be used. A helical pile foundation system is a design/build foundation system that would be designed based on site-specific geotechnical conditions. The need for a helical pile has not been determined at this time. Soil excavation quantities for the substation and concrete foundation for the main transformer will be determined in the detailed engineering phase.

2.4.1.3 Describe how excavated soils will be handled including disposal of excess soil.

Excess soil is not anticipated to be generated by the Project. If required, excavated soils will be thin-spread in a nearby upland location within the Project area after construction in accordance with terms of the solar lease agreements with landowners. Spreading subsoil on cropland or pasture will be avoided.

2.4.1.4 Materials to be used for the foundation.

2.4.1.4.1 Approximate quantity and type of concrete required for typical foundation.

No concrete is needed for driven or helical piles. Subject to detailed engineering, the main transformer foundation will use approximately 5,500 cubic feet of standard reinforced concrete with a compressive strength of not less than 5,000 pounds per square inch.

2.4.1.4.2 Materials required for reinforcement.

The concrete will be reinforced with rebar.

2.4.1.4.3. Description of the tower mounting system

This section is applicable to wind projects. No tower mounting systems will be required. However, the solar panel racking frame is mounted to the piles by a steel bracket on top of pile which is bolted to the racking frame. Additional description of the racking frame is provided in Section 2.2.5.2.

2.4.1.5 Provide technical drawings of each foundation type to be used showing foundation dimensions.

Technical drawings for the driven and helical piles and a typical main transformer foundation are provided in Appendix B.

2.4.2 Site Construction Area

2.4.2.1 Crane Pads

This section is not applicable to solar facilities and therefore is not included.

2.4.2.2 Laydown Areas

The laydown areas will be established throughout the Project sites with main laydown areas being close to site entrances and secondary laydown as required in areas local to the performance of the construction work. The specific location of the laydown areas within Project sites will be established during the detailed design and construction planning of the Project. These areas will be used to stockpile racking system components, PV modules, cable reels, and other components until they are needed. Larger components such as inverters, transformers and substation equipment will be delivered directly to the final installed location wherever possible.

A centralized delivery laydown area is shown on Figure 4.1.2 in Appendix A. This centralized delivery laydown area will be prepared by placing materials such as crushed stone, geotextile grid or both in order to prevent excessive disturbance to the area due to heavy and frequent construction traffic. This primary laydown area will also be the location for the construction trailer and for worker parking.

After construction is complete the gravel surface installed for the centralized laydown area will be removed, the soil will be de-compacted, and the site will either be seeded or immediately returned to agricultural use, depending on landowner agreement.

2.4.2.3 Parking Area

Construction worker parking will be located in or near the primary centralized laydown area shown in Figure 4.1.2 in Appendix A. Workers will be shuttled in vans or busses as required to the work areas.

2.4.2.5 Provide a Scale Drawing Showing the General Construction Setup for the Site.

The general construction set-up will consist of construction trailers, worker parking, portable washroom facilities and a laydown area to store construction equipment and materials. The initial stage of the construction will consist of the civil work for building site entrances, clearing and preparing the site in order to install silt fencing and security fencing. Once the perimeter security fencing is completed the site access can be controlled by locking fence gates located at the entrances from public roadways.

The general progression of the construction work will be to establish site access roads, complete any required grading for the substation, installation of PV racking pile foundations and electrical cable trenching. Once this is competed the PV racking will be installed, modules mounted on racking and inverter stations landed on their pad or foundation. The substation construction is typically independent of the rest of the site.

All construction will take place within the fenced panel areas and along access roads and collector lines between fenced panel areas as shown on Figure 4.1.2 in Appendix A. Erosion control best management practices (BMP's) will be installed around the limits of these areas. Detailed construction planning will be developed by the developer or general contractor closer to the construction of the solar farm once detailed engineering is completed.

2.4.3 Access Roads

2.4.3.1 Provide the total number of miles required for access roads.

Internal site access roads are expected to be between 12 and 15 miles in total length.

2.4.3.2 Describe materials to be used and methods for construction of access roads including road bed depth.

Construction matting may be used to a limited extent during construction in areas with soil strength limitations for construction vehicles that will be traversed a minimum number of times (i.e. one or two times). In these areas, the existing soil surface will remain intact, planted in perennial vegetation and maintained for operation and maintenance once construction is completed.

If areas are identified as having soil strength limitations to support construction vehicles where vehicle traffic will be more frequent (i.e. site approaches), aggregate materials may be used. In these areas, top soil will be stripped and stored for use during reclamation. Geotextile matting will be installed prior to placement of aggregate to prevent mixing with native subsoil. The aggregate would be maintained for the life of the Project. During decommissioning at the end of the Project's life, these areas will be restored by removing the aggregate, decompacting the soil if required, restoring the topsoil and either seeding to permanent perennial vegetation or returning the area to agricultural production. A schematic showing a cross section of a typical access road is provided in Appendix B. Decommissioning activities for the Project are discussed in further detail in Section 1.7.3.

2.4.3.3 Specify the required width of access roads. Fully describe any differences between final road size and that required during construction.

Internal site roads will be 16 feet wide during construction and operation of the facility.

2.4.3.4 Describe any site access control (i.e. fences or gates)

The fence that will be used to surround and provide security to the photovoltaic panel areas will consists of a seven to eight-foot-high deer exclusion fencing. The project substation will require a seven to eight-foot high chain link fence which may include three strands of barb wire at the top. Each fenced area will have at least one secured entrance gate. A typical of the fence design to be used for the Project is included in Appendix B.

2.4.4 Transportation.

2.4.4.1 Explain why existing roads and access roads cannot be used and why.

Existing public roadways will be used to access the site. No temporary roads or temporary widening of roads during construction are planned at this time.

Internal access drives within the Project area will be designed to provide access to power conversion equipment within the panel arrays and around the Project perimeter to provide access to solar equipment and accommodate ongoing maintenance of the Project components. Roads will also provide access for emergency vehicles under emergency circumstances. Roads will not be constructed within every aisle.

2.4.4.2 Description of materials to be used and methods for construction of new access roads.

As described in Section 2.4.3.2, construction matting and aggregate may be used to a limited extent in areas with soil strength limitations for construction vehicles. Where aggregate is used, it would be maintained for the life of the Project. During decommissioning at the end of the Project's life, these areas will be restored by removing the aggregate, decompacting the soil if required, restoring the topsoil and either seeding to permanent perennial vegetation or returning the area to agricultural production. A schematic showing a cross section of a typical access road is provided in Appendix B. Decommissioning activities for the Project are discussed in further detail in Section 1.7.3.

2.4.4.3 Discuss when and how transportation paths would be removed and land recovered.

Removal of transportation paths is not required since the internal site roads are specified to be 16 feet wide during construction and for final operations. At the end of the Project life, access roads will be decompacted and the site restored to its preconstruction condition. Any aggregate surfaces will be removed, and the subsoil then will be decompacted. Any windrowed topsoil will be re-distributed throughout the site and decompacted again as needed.

2.4.6 General Construction Areas

2.4.6.1 Identify size and location of lay-down areas outside of those found at the sites and any other areas used for material storage.

Individual temporary construction areas are planned at each panel site to stage the panel pieces for erection. Upland agricultural areas will be used for this purpose. The areas will be decompacted upon completion of construction prior to final revegetation. See Section 2.4.2 for a description of these areas.

In addition to the individual panel staging areas, a centralized, temporary construction laydown yard is located at the site as shown on Figure 4.1.2 in Appendix A. The laydown yard will serve several purposes including:

- Delivery of panel components and equipment;
- Delivery of construction materials as needed; and
- Material storage at the laydown yard will be a combination of open–air storage, storage in containers, and storage in trailers.

Upon completion of construction, the laydown yard will either be restored for agricultural use or be part of the Project revegetation plan. This area will be restored by removing the aggregate if used, decompacting the land and establishing perennial vegetation.

2.4.6.2 Identify size and location of construction parking areas.

The construction laydown yard will also serve as a construction parking area.

2.4.6.3 Describe the expected use of these areas after project completion.

The lay-down/parking areas will be reclaimed as described in Section 2.4.5.1.

2.4.6.4 Provide a list of all hazardous chemicals to be used on site during construction and operation (including liquid fuel).

Hazardous chemicals including fuel for vehicles, paints and lubricants will be stored on site during the construction period. Gasoline and diesel fuel will be stored in individual tanks in the vehicles. Refueling of the vehicles will be contracted with a local fuel delivery service to be completed in the evening hours. Other hazardous chemicals on site will be stored in trailers located at the central laydown area. The expected hazardous chemicals include diesel fuel, gasoline fuel, oil, grease, spray paint, and galvanization paint.

2.4.6.5 Discuss spill containment and cleanup measures including the Spill Prevention, Control, and Countermeasures (SPCC) and Risk Management planning for the chemicals proposed.

Badger State will require that a Spill Prevention, Containment and Countermeasures (SPCC) Plan be provided by the contractor awarded the construction contract for the Project. The SPCC Plan will outline the procedures and preventative measure that will be followed throughout the construction period.

Badger State and all of its contractors will be required to comply with the plan. At a minimum the SPCC Plan will identify the following:

- Typical fuels, chemicals, lubricants and paints to be used or stored in the Project area.
- Methods and location of storage.
- Locations designated for lubrication and refueling (i.e. outside of sensitive resource areas).
- Preventive measures to be used to minimize potential impacts.
- Mitigation methods to be employed, should a spill occur.
- Location of construction spill kits (gloves, booms, sorbents, barrier materials, etc.).
- Emergency notification procedures and forms.
- Contact information for individuals requiring notification if a spill should occur.

The SPCC Plan will be kept on-site during construction and will meet all EPA requirements. The SPCC Plan, because of its specificity, will be written by the contractor prior to commercial construction.

2.4.7 Transmission and Distribution Interconnection

2.4.7.1 Describe any transmission or distribution grid interconnection requirement.

The Project will be interconnected to the transmission grid through an existing substation owned by American Transmission Company (ATC). The ATC station is located to the north-east of the proposed Project substation and will require a short 138kV overhead line between the two stations. See Section 1.7.1 for the current status of the MISO interconnection process.

The output of the MISO studies will determine the design details for the substation. See Figure 4.1.4.1 (Appendix A) for a 1-line drawing of the proposed interconnection with the existing ATC 138kV Jefferson Substation. Badger State has coordinated with ATC and WE Energies regarding this proposed connection point.

2.4.7.2 Describe all communications and agreements, official or otherwise, with the transmission or distribution owner.

The Project will enter a Generator Interconnection Agreement early in 2020 between the Project LLC, MISO as the Transmission Provider, and ATC as the Transmission Owner. Ranger Power has been in communication with both MISO and ATC since early in 2017 to discuss the interconnection of the Project.

2.4.7.3 For transmission interconnections, indicate where the Project is in the MISO Queue and provide copies of the latest draft or final MISO report for the Project interconnect. During the PSC review process applicant must continue to supply the latest reports from MISO.

The Project is in the MISO queue position as J818 and is in the 2017-DPP-August Cluster in the East-ATC (Eastern Wisconsin) study group. MISO has competed Phase 1 and Phase 2 System Impact Studies which are included in Appendix D. The final Phase 3 study report is expected in August 2019 and will be provided to the Commission when published.

2.4.8 Collector Circuits

2.4.8.1 Total number of miles of collector circuits required – separated by circuit type (overhead vs. underground).

The current configuration for the collector system contains a bulk total of approximately 30 miles of cables consisting of three single conductor cables running in a bundle (one circuit) or a single cable containing all three conductors. Wherever possible, the individual electrical collection circuits will be run within the same route and will share the same trench up to a maximum of five circuits in parallel through the site and will converge into nine parallel circuits as they approach the Project's substation.

The collector circuits are planned as an underground system with direct buried cables or cables installed in direct buried ducts. The table below details the length of underground collector circuits required for the Project.

TABLE 2.4-1 COLLECTOR CIRCUIT LENGTHS

	Collector Trench Length (mi)	Total Cable Length* (mi)
Bore	**0.70**	**1.31**
Alternate Array Area**	0.18	0.31
Optional Array**	0.10	0.10
Primary Array**	0.42	0.89
Trench	**14.45**	**28.69**
Alternate Array**	2.20	3.26
Optional Array**	1.79	1.83
Primary Array**	10.47	23.60
Grand Total	**15.15**	**30.00**

*More than one cable may occupy a collector trench.
**Refer to Section 1 for a definition of these areas.

2.4.8.2 Specify the collector circuit voltage to be used.

The collector circuit voltage will be 35kV.

2.4.8.3 Transformer type, location, and physical size of transformer pad at each site.

The Project will include a collector substation with a 138/34.5kV main transformer as described in Section 2.5. The main transformer will be selected at the time of construction. A schematic of a representative main transformer that is similar in size and characteristics to what will be selected for the Project is provided in Appendix B. Project facility will consist of solar panels producing DC voltage which must be changed to AC voltage through a series of inverters. The inverters will be spaced several hundred feet apart from each other. Approximately 73 inverters will be installed throughout the Project area. The final selection of the inverter model will be made at a future date based on the current market offering. A manufacture brochure of an inverter which is used for the basis of the preliminary design included with this submission is provided in Appendix B. The dimensions of the representative inverter are 8 x 2.3 x 2.2

to 11 x 2.3 x 2.2 meters (WxHxD) depending on the installation configuration. The inverters are typically part of a skid assembly with the inverter and the assembly being mounted on a driven pile foundation.

2.4.8.4 Underground Collector Circuits

The collection system for the Project will be broken into nine separate circuits. Each of the nine circuits will carry approximately 11 percent of the generating capacity of the Project. The nine circuits are to be grouped into common cable trenches up to a maximum of 5 circuits due to the required de-rating of cables due to mutual heating of the surrounding soils. It is anticipated that two cable trenches can carry the nine circuits to the substation and each circuit will be connected to its own switchgear breaker.

2.4.7.4.1 Conductor to be used

The preliminary design assumes the conductor will be aluminum. Insulation: 35kV TRXLPE, 100% insulation, (1/6, 1/3 and 2/3 concentric neutral depending on wire size), PVC Jacket overall. Cables are MV-105. Final specifications will be determined during the detailed engineering phase.

2.4.7.4.2 Burial depth and width of trench

The collection system will either be buried at a depth of 36 inches to the top of the cables or will be enclosed within a conduit and buried at a depth of 24 inches. The trench for the cable will be one foot wide. Where multiple cables are installed parallel to each other, the cable separation will be two feet apart, therefore the width of the trench will vary depending on the number of circuits within the trench. Please refer to Appendix B for a typical trench layout based on varying number of cables.

2.4.7.4.3 Describe trench and how lines would be laid (direct buried, conduit etc.) Provide scale drawing of underground circuit.

Installation of the collection system will be by use of a vibratory plow or trenching method in upland areas. The vibratory plow directly impacts an area approximately 12 inches wide. A typical of the vibratory plow method is included in Appendix B. Underground horizontal directional drilling (HDD) will be utilized in environmentally sensitive areas, such as wetlands and waterways, to avoid impacts to these resources. In addition, there are several underground HDD drilling areas that will be used to cross roadways (USH 18, STH 89, and CTH G).

Badger State has had numerous discussions with the host landowners and understands that there are drain tiles in this area. If any drain tiles are damaged due to installation of buried conduit those will be repaired during construction.

2.4.8.5 Overhead Collector Circuits

Overhead collector circuits will not be developed for the Project.

2.4.9 Construction Site Lighting

It is expected that at the main laydown area lighting will be used during construction only and will be installed either on pole(s) or on the building to provide adequate light for safety and security. Construction is planned to be conducted during daylight hours and therefore not require additional site

lighting. In the event that site lighting is needed to accommodate safe working conditions for construction, portable lighting and generators may be used as needed.

2.4.9.1 Describe the site lighting plan during Project construction.

Construction will occur during normal daylight hours. Therefore, with the exception of the lighting at the main laydown area, lighting on site during construction is not anticipated to be required. However, if extensions of working hours would be needed, temporary lighting may be used in the in the form of portable lighting and generators.

2.4.9.2 Provide copies of any local ordinances relating to lighting that could apply.

Local ordinances, including the Jefferson County Zoning Ordinance are provided in Appendix E. Under Section 11.03 General Conditions, subpart 6(h) Airport Approach Protection, lighting restrictions apply within the vicinity of airports in that lighting may not be used which makes it difficult to distinguish airport lights, or impairs visibility in the vicinity of the airport, or otherwise endangers the landing, taking off, or maneuvering of aircraft. The Town of Oakland Comprehensive Plan includes recommendations for full cut-off lighting (less than 25-feet in height and hooded) to reduce impacts on neighboring properties and protects the night sky. No lighting will be used on site that violates these ordinances. No provisions for lighting are included in ordinances for the Town of Jefferson.

2.5 SUBSTATION

- ***If the Project includes the construction of a substation or modifications to an existing substation, provide the following information:***

2.5.1 A complete electrical description of required substation facilities including a list of transformers, busses, and any interconnection facilities required

This section discusses the substation that will be developed for the Project. A preliminary Substation layout schematic can be found in Appendix B.

The Project substation design will be completed during detailed engineering for the Project. A footprint of 280 feet by 195 feet has been allocated at this stage and will generally include items below within the substation:

- 34.5kV switchgear or open-air switches;
- 34.5kV bus and supporting structures;
- 34.5kV metering and instrumentation;
- Station service transformer;
- Main power transformer 34.5kV to 138kV, may also be split into two smaller transformers;
- 138kV circuit breaker;
- 138kV bus and supporting structures;
- 138kV metering and instrumentation;

- 138kV dead-end structure and outgoing transmission line to ATC substation;
- Protection and control building;
- Internal access roads;
- Security fence with vehicle gate, man gate, barbed wire. Fence to be grounded per NESC requirements;
- Buried power cables, control cables and bare copper grounding grid;
- Lightning protection masts (as required);
- Yard lighting to be used during maintenance and or during emergency; and
- Any required power factor control equipment such as a STATCOM or capacitor bank.

2.5.2 Indicate the size (in acres) of the land purchase required for the new substation or substation expansion.

A schematic showing the approximate orientation of the substation on the property is provided in Appendix B. The land required for the Project substation is part of the lease agreement with parcel number 014-0614-0543-000. The interconnection facilities will be located within ATC's existing substation. ATC does not require any additional land for the interconnection.

2.5.3 Indicate the actual size of the substation or substation addition in square feet, the dimensions of the proposed substation facilities, and the orientation of the substation within the purchase parcel.

The proposed Project substation will have a footprint of 280 feet by 195 feet. A schematic showing the approximate orientation of the substation on the property is provided in Appendix B.

2.5.4 Identify current land ownership and whether applicant has control of property or whether or not an option to buy has been signed.

The land designated for the Project substation is part of an overall lease of parcel number 014-0614-0543-000.

2.5.5 Describe substation construction procedures (in sequence as they will occur) including erosion control practices (see Section 3.1).

A typical construction sequence for the Project substation involves, in order, site grading work, below grade foundation installation, by above grade physical construction of buswork and installation of major electrical equipment, wiring and completion of all terminations, followed by testing, commissioning, and ultimately energization. A site-specific construction specification and schedule will be developed but is not yet available. All contractors will be required to follow the Storm Water Pollution Prevention Plan as well as adhere to any site-specific environmental requirements including erosion and dust control.

2.7 OPERATIONS AND MAINTENANCE BUILDING

An Operations and Maintenance building is not proposed for this Project. However, the applicant will coordinate with the Commission if it is determined it will be needed in the future.

3.0 CONSTRUCTION SEQUENCE AND WORKFORCE

3.1 CONSTRUCTION SEQUENCE

3.1.1 Provide the construction schedule for the proposed Project Include a timeline showing construction activities from beginning of construction to in-service. Identify all critical path items.

The estimated construction schedule is provided in Table 3.1 below.

TABLE 3.1-1 ESTIMATED PROJECT CONSTRUCTION SCHEDULE

Activity	Start	End
Start of Construction	July 2021	
Workforce Mobilized	July 2021	August 2021
Vegetation removal and localized grading	August 2021	September 2021
Staging and Laydown Areas Established	September 2021	October 2021
Access Roads and Installed	September 2021	October 2021
Posts Driven	October 2021	April 2022
Tracking System Racks Installed	October 2021	April 2022
Inverter Pads Installed	October 2021	April 2022
Solar Modules Installed	April 2022	October 2022
Project Substation Built	March 2022	August 2022
Gen-Tie Line Built	April 2022	July 2022
Commissioning	October 2022	November 2022
In-Service Date		November 2022

3.1.2 Provide a description of the staging and construction sequence required for building the proposed Project at a typical site. Include the delivery of materials.

The following provides a description of the staging and construction sequence for the project:

- Stabilize construction entrances and exits;
- Receive security fencing and gate materials;
- Install perimeter security fencing and gates;
- Remove vegetation in areas of construction and perform limited and localized grading as needed for staging and lay-down areas and for transformer substation;
- Develop the staging and lay-down areas for receiving of construction materials and equipment, storage of the construction materials and equipment containers, location of construction trailers and parking for personnel and construction-related vehicles;
- Survey and stake the access roads and panel locations;

- Develop the access roads (limited grading is anticipated as roads will be constructed at grade when possible);
- Delivery of equipment, including piles and potentially helical piers, aluminum supports/mounting structures, tracking systems and inverters. Because the Project will be constructed in blocks and multiple blocks will be constructed simultaneously as well as over time, deliveries will continue over time in advance of construction of the blocks;
- Install driven piles or helical piers for a given block;
- Install aluminum supports/mounting structures on to piles for a given block;
- Install inverter pads for a given block;
- Install tracking systems for a given block;
- Delivery of PV modules and collection system equipment;
- Install solar PV modules;
- Install collection system by means of trenching and directional drilling;
- Electrical testing and equipment inspections for each block and the collection system;
- Receive materials and equipment for step-up transformer substation;
- Install step-up transformer substation and connect collection system to transformer substation;
- Electrical testing and equipment inspections of transformer substation and connections to substation;
- Install and inspect tie-in to ATC substation;
- Conduct interconnection inspections and testing and Project commissioning;
- Vacate and restore staging and lay-down areas. De-compact the subsoil, with windrowed topsoil re-distributed and de-compacted again as needed; and
- Reseed and revegetate staging and lay-down and other disturbed areas consistent with revegetation and restoration plan.

3.1.3 Estimate of Time Required to Complete Construction at a Typical Photovoltaic Site.

The duration of construction for this project is estimated to be 12-18 months. The schedule in 3.1.1 assumes 18 months. This timeline is in part dependent on winter weather conditions and the ability to work through the winter months. If the winter is mild, activities such as driving posts, installing of racking, and installing inverter pads could be accelerated. In this case, the total construction period could last 12 months.

3.3 WORKFORCE

3.3.1 Provide Information on the Workforce Size and Skills Required for Plant Construction and Operation.

During construction, the work force will be primarily comprised of laborers, equipment operators and management personnel. The equipment operators will operate civil equipment, pile drivers, cranes, and material handling equipment. Most of the personnel required to construct this project will be laborers that install racking systems and place modules. Approximately 300 workers are anticipated to be needed to construct the project. Once construction is complete, the facility will require approximately 3-5 full time personnel for O&M. The plant operator(s) will have specific training / expertise to run a solar facility.

3.3.2 Estimate How Much of the Expected Workforce Will Come From Local Sources.

Approximately 50 percent of the workforce is expected to come from local sources. This percentage is dependent upon the labor market and their availability at the time of construction.

4.0 PROJECT MAPS, AERIAL PHOTOGRAPHY, PHOTO SIMULATIONS, AND GIS SHAPEFILES

Required maps listed below are included in Appendix A.

4.1 PROJECT AREA MAPS

4.1.1 General Project Area Map

4.1.2 Detailed Project Area Map

4.1.3 Topographic Map

4.1.4 Substation

4.1.4.1 Substation Map

4.1.4.2 Engineering Diagram

4.1.5 O&M Building

Figure 4.1.5 is not included because no O&M Building will be constructed on this site.

4.1.6 Natural Resources and Land Use/Ownership Maps

4.1.6.1 Wetland Maps

4.1.6.2 Land Ownership Maps

4.1.6.3 Public Lands

4.1.6.4 Land Cover

4.1.6.5 Flood Insurance Rate Maps (FIRMs)

4.1.6.6 Soil Survey Maps

4.1.6.7 Bedrock Maps

4.1.7 Community Maps

4.1.7.1 Zoning Maps

4.1.7.2 Sensitive Sites

Figure 4.1.7.2 is not necessary as no schools, day care centers, hospitals or nursing homes were identified within 0.5 miles of the substation site or 1 mile of the Project Area.

4.1.7.3 Airport Maps

4.1.8 Communication Infrastructure

4.1.8.1 Communication Infrastructure Maps

Figure 4.1.8.1 is not included because this section is understood to not be required for solar projects.

4.2 GIS SHAPEFILES

Appendix F (submitted on a data disc) contains the following GIS-related items as part of the application:

- GIS shapefiles containing all the data used to produce all maps in the application.
- A spreadsheet listing all GIS data files, a file description, the source of the data, and the date when the data was collected or published.
- Map files in Esri ArcGIS *.mxd format for all GIS maps in the application.
- Esri ArcReader published map files in *.pmf format for all maps in the application.
- Georeferenced 2017 orthophotography.

All shapefiles and orthophotography are referenced to Wisconsin Transverse Mercator (WTM) projection system.

4.2.1 Project Area Boundary

4.2.2 Project sites identified by number

4.2.3 Alternate project sites identified by number

4.2.4 Access roads for proposed site (include road width)

4.2.5 Access roads for alternate sites (include road width)

4.2.6 Crane paths required for proposed and alternate turbine sites (include path width).

This information is not required for solar projects.

4.2.7 Underground collector circuits (include number of conductors and voltage)

4.2.8 Overhead collector circuits (include voltage)

No overhead collector circuits are proposed.

4.2.9 Electric distribution lines

4.2.9.1 All electric distribution lines within the entire Project Area (include voltage of each line and phases present (A, B, and or C,),

4.2.9.2 All electric distribution lines within one mile of the Project boundary area (include voltage of each line and phases present (A, B, and or C).

Voltage and phase of existing distribution is currently unknown. Line locations have been provided on aerial photos.

4.2.10 Transmission lines within the Project Area identified by voltage.

4.2.11 New Substation - provide shapefiles showing:

4.2.11.1 Perimeter of entire parcel acquired or to be acquired,

4.2.11.2 Perimeter of substation,

4.2.11.3 Access road,

4.2.11.4 Other facilities such as a retention pond or storm water control,

4.2.11.5 All collector circuits entering the substation,

4.2.11.6 Transmission interconnect.

4.2.12 Expansion of an Existing Substation

An expansion of the existing substation is not proposed for the Project.

4.2.13 O & M Building

4.2.13.1 Perimeter of property acquired,

4.2.13.2 Perimeter of building,

4.2.13.3 Location and perimeter of other buildings,

4.2.13.4 Location and perimeter of parking lot,

4.2.13.5 Location of access road.

O&M Building is not proposed for the Project.

4.2.14 Wetlands in the Project Area

4.2.14.1 WWI Wetlands,

4.2.14.2 Delineated wetlands. (See Section 6.2.1)

4.2.15 Land owners/buildings

4.2.15.1 Residences on all participating parcels,

4.2.15.2 Non-participating residences inside the Project boundary,

4.2.15.3 Land ownership and parcels within the Project Area,

4.2.15.4 Land ownership and parcels within 1 mile of the Project Area boundary,

4.2.15.5 Confined animal operations - provide shapefiles showing:

- *The locations of any confined farm animals within the Project Area,*
- *All confined animals operations within one mile of the Project Area boundary,*
- *For each confined animal shapefile provide attribute data that identifies the type of animal, the number of confined animals, and the name of the land owner.*

No DNR-permitted Confined Animal Feeding Operations (more than 1,000 animals) are located within one mile of the Project Area although one permitted chicken farm is located just beyond one mile from the Project Area. Badger Solar has attempted to map the locations of smaller confined animal operations based on publicly available data. Specific types and numbers of animals are not known; however, cattle, sheep and horses are common in Jefferson County.

4.2.16 All public lands within the Project boundary and public lands within 2 miles of the Project boundary.

4.2.17 All public airport runways within 10 miles of the Project boundary. Show runway orientation and length

4.2.18 All private airports and landing strips inside and within two miles of the proposed Project boundary. Show runway orientation and length.

4.2.19 Land Cover/Vegetative Communities (Do Not Use Obsolete DNR Land Cover data.) See section 5.3.

4.2.20 Provide a GIS shapefile showing the locations of properties enrolled in the Conservation Reserve Program.

4.2.21 FEMA flood plains within the Project Area.

4.2.22 Aerial Photos (no older than three years) of Project Area and surrounding landscape (10 mile radius of the Project Area).

4.3 TOPOGRAPHY – RASTER FILES OF TOPOGRAPHIC FEATURES WITHIN THE PROJECT AREA AND SURROUNDING LANDSCAPE (10 MILE RADIUS OF THE PROJECT AREA)

Raster files of topographic features within the project area and surrounding landscape are included in Appendix F.

4.4 PHOTO SIMULATIONS

Existing aesthetic conditions of the Project area and its vicinity were documented with photographs taken during September and November of 2018. Prior to commencing the photo simulations for the Project, Badger Solar consulted with Commission staff determine suitability of Key Observation Points (KOPs). Four KOPs were selected and used to create visual simulations of what the project may look like once constructed:

- KOP 1 – from Wisconsin Highway 89
- KOP 2 – from U.S. Highway 18
- KOP 3 – from Perry Road
- KOP 4 – from County Road G

The Visual Resources Technical Report is provided in Appendix G. It contains baseline photographs and visual simulations for the four KOPs as well as methodology.

5.0 NATURAL AND COMMUNITY RESOURCES, DESCRIPTION AND POTENTIAL IMPACTS

5.1 SITE GEOLOGY

5.1.1 Describe the geology of the Project Area.

Jefferson County lies within the Eastern Lake Section of the Central Lowland Physiographic Province of the United States. Characteristic features of the Central Lowland province are flat lands with geomorphic remnants of glaciation. The Project area is underlain by the Horicon member of the Holy Hill formation which was deposited during the last part of the Wisconsin Glaciation. The Horicon Member is the surficial unit in much of south-central Wisconsin where it generally lies directly on bedrock or sand and gravel with a sharp contact. The Horicon Member includes till, associated sand and gravel, and other stratified deposits.

Bedrock within the Project area is primarily of the Sinnipee Group consisting of dolomite with some limestone and shale and includes Galena, Decorah and Platteville formations. Also present is the Ancel Group of orthoquartzitic sandstone with minor limestone, shale and conglomerate, and includes the Glenwood and St. Peter Formations. Lowest in stratigraphy is the Prairie du Chien Group consisting of dolomite with some sandstone and shale and includes Shakopee and Oneota formations. Depth to bedrock in most of the project area is less than 15 meters (50 feet) (Borman and Trotta, 1975). U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) mapping indicates that depth to a restrictive layer for most of the project area is greater than 2 meters (6.5 feet).

The Project area is primarily 102 to 152 cm (40 to 60 inches) of loess over loamy stratified outwash or sandy loam till. The substratum commonly is stratified loamy outwash, but in some pedons is gravelly or sandy outwash or sandy loam till. Unconsolidated surficial material in closed depressions within the Project area are of herbaceous organic materials 61 to 130 cm (16 to 51 inches) thick overlying marly material on outwash plains, lake plains, and ground moraines.

5.1.2 Geotechnical Report on Soil Conditions

The preliminary geotechnical investigation was performed for the Project. A summary of the geotechnical investigation is presented here as well as discussion related to prime farmland based on review of USDA NRCS SSURGO data. The full preliminary geotechnical report with boring logs can be found in Appendix H.

5.1.2.1 Provide a summary of conclusions from any geotechnical report or evaluation of soils in the Project Area including: [subjects in bullet below]

Badger State commissioned Professional Service Industries, Inc. (PSI) to perform a preliminary subsurface exploration and geotechnical engineering evaluation for the Project. The purpose of the investigation and report was to explore subsurface conditions, conduct field and laboratory testing to

characterize the subsurface soils and bedrock properties and to provide preliminary geotechnical engineering parameters for the design and installation of the tracking systems for the solar panels.

- ***Results of soil borings including a review of soil bearing capacity and soil settlement potential.***

Seventeen soil test borings were performed for this project at select locations within the Project area and were planned to extend to a depth of 20 feet below the existing ground surface. A depth of 20 feet was achieved in all but one boring where auger refusal was encountered at a depth of 13 feet. Three borings were extended beyond the planned depths, to depths of 25 to 40 feet due to the presence of organic and/or low strength soils. Test pits were also performed to a depth of 10 feet adjacent to 6 select boring locations. The purpose of advancing the test pits was to determine the presence of boulders/cobbles that may create refusal conditions in the test borings. Boulders and/or cobbles were determined present within the area where refusal was observed at the one test boring mentioned above. Soil boring and test pit locations are shown as Figure 1 in the Geotechnical Report in Appendix H of this application.

According to the geotechnical evaluation, a majority of the Project area has a topsoil thickness ranging from about 5 to 24 inches comprised of dark brown or black organic silt. The surface materials at one bore location consisted of about 8 inches of aggregate base comprised of brown crushed sand and gravel. Two other locations consisted of natural brown clayey sand soils and silty fine sand with gravel to depths of about 1 to 3 feet.

The surface materials under a majority of the Project area were underlain by cohesive soils comprised of brown, grayish brown, or gray silty clay or sandy clay; extending to depths of about 1.5 to 7 feet. The surface materials at two bore locations were underlain by organic soils consisting of peaty topsoil comprised of black organic silt, or gray, dark brown, or dark gray organic silt with shell matter (lake marl), extending to depths of about 6 and 22 feet.

Below the clay layer and organic layer, natural granular soils are present throughout the Project area that extended to the boring termination depths. The granular soils generally consisted of light brown, brown, or gray silty fine sand, sandy silt, clayey sand, or medium to coarse sand; with varying gravel content and areas of possible cobbles and boulders.

Groundwater was encountered during auger advancement and during test pit excavation operations at depths ranging from about 3 to 21 feet. Upon completion and removal of the augers, groundwater was present above the caved soils at borings at depths ranging from about 5 to 8 feet. The groundwater was generally observed within natural granular soils. Estimated groundwater depths at the specific boring locations at the time of drilling are presented in Table 1 (Soil Data) enclosed in Appendix C of the Geotechnical Report included as Appendix H of this application.

- ***Soil conditions related to site geology that might create circumstances requiring special methods or management during construction.***

Natural soils suitable for support of the proposed solar racks, service buildings, and transformers are generally present within most of the boring and test pit locations at relatively shallow depths. However, fill, buried topsoil, organic, and low strength natural soils were present within some of the borings/test pit locations. These soils are not considered suitable for standard building foundation support. Drilled piers,

helical piers or driven piles as well as various other options were recommended for consideration for support of the proposed structures in these areas.

Groundwater was encountered at depths ranging from about 3 to 21 feet below existing grades at some locations within the Project area further described in Appendix H. Dewatering will be required in these areas. Additionally, excavation instability will likely be experienced due to the presence of granular soils at some locations, especially where relatively shallow groundwater is also encountered. Several mitigative measures are provided in Appendix H including the use of driven piles, helical piers, and possibly drilled piers to help alleviate concerns with constructability due to groundwater control.

Evaluation and recommendations regarding site preparation, preliminary foundation design, floor slab subgrade, preliminary gravel access road recommendations including drainage and maintenance, utility construction are provided in detail in the Geotechnical Report in Appendix H.

5.1.2.2 Depth to Bedrock

- ***Identify any sites where foundation construction must be modified because of the presence of bedrock, and construction methods and foundation issues associated with situations where bedrock formations are near the surface.***

Seventeen soil test borings were performed during the geotechnical evaluation for the Project. A depth of 20 feet was achieved in all but one boring where auger refusal was encountered at a depth of 13 feet due to possible cobbles, boulders, or weathered bedrock. Three borings were extended beyond the planned depths, to depths of 25 to 40 feet due to the presence of organic and/or low strength soils.

The construction activities for the Project include driven piles for the tracking system, collection system trenches and other shallow excavations for access roads, laydown yard and a substation slab foundation. Typical driven pile foundations are six inches wide by nine-foot steel sections with eight to 15 feet embedment. If pile refusal is encountered due to shallow bedrock or other subsurface obstructions, alternate foundation installation techniques or designs such as helical piles may be used.

Results of the geotechnical report determined that standard, driven piles should be feasible for the majority of the site including areas where low strength and/or organic soils were present to greater depths ranging from about eight to 27 feet below the existing ground surface. Helical piles may also be considered in areas where groundwater maybe encountered. A helical pile foundation system is a design/build foundation system that would be designed and installed by a qualified contractor. Further evaluation of foundations types to be employed for the project will take place during final design.

Utilities for this project will generally be limited to electric utilities which will be placed at depths of about two to three feet below proposed grades. Due to the relatively shallow installation depths of these utilities, no major excavation related difficulties are anticipated.

Therefore, based upon a review of the surface and bedrock geology of the area, and information gathered during the preliminary geotechnical review, the predominant depth to bedrock within the Project area should be greater than the proposed construction activities. A final geotechnical study will be completed prior to construction which will confirm the exact pile requirements. If subsurface conditions preclude installation of driven piles, alternative pile types such as helical piles may be used. The final decision will be approved by a structural engineer to ensure compliance with all applicable regulations and the safety and durability of the Project.

- ***Likelihood or potential that construction on bedrock formations may negatively impact private wells within two miles of panel sites.***

Since a depth of 20 feet was achieved in all but one boring where auger refusal was encountered at a depth of 13 feet due to possible cobbles, boulders, or weathered bedrock, there is a low likelihood that construction on bedrock formations may negatively impact private wells within two miles of the Project area. If bedrock formations are encountered during the final subsurface exploration and geotechnical engineering evaluation, measures will be implemented to guard against the introduction of contaminants into groundwater due to accidental release of construction related chemicals, fuels, or hydraulic fluid during construction. Spill-related impacts from construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. To avoid spill-related impacts, the construction contractor will be required to prepare a Spill Prevention, Control and Countermeasures (SPCC) Plan that outlines measures that will be implemented to prevent accidental releases of fuels and other hazardous substances and describes response, containment, and cleanup procedures. By implementing the protective measures set forth in the SPCC Plan, long-term contamination due to construction and operation activities is not anticipated.

5.2 TOPOGRAPHY

5.2.1 Describe the General Topography of the Project Area

- ***Raster files of topographic features within the project area and surrounding landscape (10-mile radius of the project area).***

Raster files of topographic features within the Project area and surrounding landscape, including the area within a 10-mile radius, can be found in the electronic files provided for section 5.2.

The surface topography of the Project area is predominantly closed depressions with minor amounts of gently rolling hills and plains, reflecting the underlying bedrock and glacial ground moraine deposits. The surface features were formed from deposition and erosion during periods of glaciation. The elevation ranges from 255 to 305 meters (840 to 1000 feet) above sea level. The Project area is primarily within closed depressional areas with slope gradients less than 2 percent. The western portion of the Project area is slightly more gently sloping in nature, with slopes ranging from 0 to 15 percent.

5.2.2 Describe Expected Changes to Site Topography Due to Grading Activities

The topography of the Project area will be temporarily altered by construction activities including installation of the foundations for the tracking systems and trenching for the collection system. Other than grading requirements for the substation/step-up transformer to be built within the project area, no significant grading is anticipated. Panel arrays will be designed and constructed to conform to the existing topography to avoid the need for significant grading. Access roads will be constructed as close to existing grade as possible; maintaining preconstruction hydrologic flow patterns.

Upon completion of construction activities, the areas temporarily impacted due to construction activities will be returned to their pre-construction topography.

5.3 LAND COVER

The Project is located in a rural area dominated by agriculture. The land cover is dominated by agricultural crops and pasture grasses for grazing animals. Areas not utilized for farming activities consist of woods and wetlands. Figure 4.1.6.4 in Appendix A provides an overview of the land cover existing within the Project area.

5.3.1 Vegetative Communities in the Project Area. List and identify the dominant plants in the following community categories: Analysis should use recent data, not greater than 2 years old. Land cover can be based on recent aerial photography or on-site evaluation.

The vegetative communities in the Project Area were evaluated by a combination of aerial photographic review and field visits during 2018. Most of the Project is comprised of active agriculture under row crop production.

5.3.1.1 Agricultural

- ***Row Crops.***

The dominant vegetation within the agricultural areas are under row crop production comprised of corn (*Zea mays*) and soybeans (*Glycine max*).

- ***Hay/Pasture Areas/Old Field.***

A few pasture areas were also observed, dominated by common forage species such as alfalfa (*Medicago sativa*) or orchard grass (*Dactylis glomerata*).

- ***Other Agricultural Areas.***

Other agricultural areas were identified and are currently in mint (*Mentha sp.*) production. Common vegetation observed within or adjacent to the cultivated fields include common ruderal species such as ragweed (*Ambrosia spp.*), chufa (*Cyperus esculentus*), amaranth (*Amaranthus spp.)*, common plantain (*Plantago major*), and Canada thistle (*Cirsium arvense*).

5.3.1.2 Non-Agricultural Upland

- ***Prairie/Grasslands.***

The dominant vegetation within the non-agricultural upland areas are comprised of grassland areas along the perimeter and between agricultural fields and isolated woodland areas. The upland grasslands are dominated by reed canary grass (*Phalaris arundinacea*), quackgrass (*Elymus repens*), smooth brome (*Bromus inermis*), velvet leaf (*Abutilon theophrasti*), field penny cress (*Thlapsi arvense*), common milkweed (*Asclepias syriaca*), Queen Anne's lace (*Daucus carota*), giant ragweed (*Ambrosia trifida*), red-root amaranth (*Amaranthus retroflexus*), Canada thistle, stinging nettle (*Urtica dioica*), and green foxtail (*Setaria viridis*).

- ***Upland woods.***

Upland woodlands located within the Project Area are comprised of relatively small isolated woodlots and perimeter areas within the agricultural landscape. These woodlands are primarily dominated by box-elder (*Acer negundo*), black cherry (*Prunus serotina*,), American elm (*Ulmus americana*), white oak (*Quercus alba*), and black walnut (*Juglans nigra*) trees. The shrub understory vegetation within these areas includes Tartarian honeysuckle (*Lonicera tartarica*), nannyberry (*Viburnum lentago*) common buckthorn (*Rhamnus cathartica*), common blackberry (*Rubus allegheniensis*).

5.3.1.3 Wetlands

- ***Forested Wetlands.***

A small amount of forested wetland communities are present within the Project Area, and are further described in Section 6.2 and within the Wetland Delineation Report in Appendix I.

- ***Non-forested Wetlands.***

The wetlands within the Project area are mostly comprised of non-forested wetland communities including wet meadow and farmed wetlands. Open water associated with waterways are included in this category. These wetlands and their dominant species are further described in Section 6.2 and within the Wetland Delineation Report in Appendix I.

- ***Marshes, Bogs, and Fens.***

Other non-forested wetland types such as marshes, bogs, or fens do not exist onsite.

5.3.2 Acres of Land Cover Categories in Project Area

5.3.2.1 -5.3.2.4 Agricultural, non-Agricultural Upland, Wetlands, and Developed Lands

Land cover within the Project Area was identified using aerial photography and direct field observations taken during site visits in the summer of 2018. The land cover was digitized into a GIS layer to quantify the existing site conditions into the categories as specified in Table 5.3-1. The total land cover acreages within the Primary, Alternate, and Optional Project Areas for each land cover category are provided in Table 5.3-1. The Primary, Alternate, and Optional Project Areas are further described in Section 1.0.

TABLE 5.3-1 TOTAL LAND COVER IN ACRES

Land Cover Classification	Total Land Cover	Primary Project Area	Alternate Project Area	Optional Project Area
Agriculture				
Row Crops	1258.9	926.8	132.8	199.3
Hay/Pasture/Old field	7.9	7.1	0.2	0.5
Other Agriculture	363.2	189.4	173.8	<0.1
Non-Agricultural Upland				
Prairie/Grassland	7.1	6.8	0	0.3
Upland Woods	56.6	30.3	18.9	7.3
Wetlands				

Land Cover Classification	Total Land Cover	Primary Project Area	Alternate Project Area	Optional Project Area
Non-Forested (including open water)	41.3	31.4	6.4	4.6
Forested Wetlands	4.1	1.1	3.0	0
Developed Land				
Residential	3.8	3.7	0	0.1
Commercial /Industrial (includes road ROW)	7.2	7.2	0	0
Project Area Total	1,750.0	1203.9	335.1	211.1

5.3.3 Land Cover Impacts

The land cover analysis described in Section 5.3.2 was used to calculate the acreage of impacts due to construction and operation of the Project based on the site design. Impacts are identified by the various Project facilities such as the Solar Production Area, Collection System, Access Roads, Substation, and Perimeter Areas. A description of the impacts associated with each of these areas are provided in Sections 5.3.1.1 through 5.3.1.6.

5.3.3.1 Solar Production Areas (within fence)

The Solar Production Areas are defined as all portions of the project facilities located inside the proposed fencing of the site. These areas include the panels and associated facilities such as MV stations, access roads, and underground collector lines. During construction most of these areas will be used for accessing panel locations and for temporarily staging materials and equipment. Impacts during construction are mostly limited to agricultural lands to the extent practicable. However, there will be some localized clearing along fencelines and small wooded areas. Larger forested areas that are within the fenced areas will be avoided. Some panels and other facilities will be located within some of the farmed wetland areas, as further described in Section 6. However larger wetland communities and nearby waterways will be flagged and avoided. Best management practices (BMPs) will be employed to protect wetlands and waterways near the construction areas.

Once the panels and associated facilities have been installed, the surrounding area will be seeded with an appropriate herbaceous seed mix as described in Section 6.5.3.4. At the end of the Project's useful life, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled, and the site restored to its preconstruction condition. If previously farmed, the site may be returned to farm production as described in Section 1.7.3. However, for the duration of the Project, impacts to agricultural lands will be considered permanent.

Table 5.3-2 below provides the total land cover within the Solar Production Area identified by Primary, Alternate, and Optional Project Area areas.

TABLE 5.3-2 SOLAR PRODUCTION AREA IMPACTS IN ACRES

Land Cover Classification	Primary Project Area[1]	Alternate Project Area[1]	Optional Project Area[1]
Agriculture			
Row Crops	677.0	70.4	144.3
Hay/Pasture/Old field	0	0	0
Other Agriculture	120.9	138.3	0.4
Non-Agricultural Upland			
Prairie/Grassland	1.1	0	<0.1
Upland Woods	2.0	1.1	0.5
Wetlands			
Non-Forested Wetlands (including open water)	4.5	2.5	0
Forested Wetlands	0	0	0
Developed Land			
Residential	0	0	0
Commercial /Industrial (includes road ROW)	<0.1	0	0
Project Area Total	805.6	212.2	145.3

[1]leased area

5.3.3.2 Collection System

The Collection System is comprised of the underground cabling infrastructure located between the Solar Production Areas (outside fenced areas). The width of the Collection System will vary depending on the number of cables in a given location. For the purpose of impact analysis in the section, installation of the Collection System is estimated to be an approximate 15-foot temporary impact width and will be installed utilizing trenching methods. Where these facilities must cross waterways, impacts will be avoided by using directional bore methods.

TABLE 5.3-3 COLLECTION SYSTEM IMPACTS IN ACRES

Land Cover Classification	Primary Project Area	Alternate Project Area	Optional Project Area
Agriculture			
Row Crops	0.6	0.2	0.5
Hay/Pasture/Old field	<0.1	0	0
Other Agriculture	1.7	0	<0.1
Non-Agricultural Upland			
Prairie/Grassland	0.2	0	0
Upland Woods	0.5	<0.1	0
Wetlands			
Non-Forested Wetlands (including open water)	<0.1	0	0.2
Forested Wetlands	0	<0.1	0
Developed Land			
Residential	0	0	0
Commercial /Industrial (includes road ROW)	0.1	0	0
Total	3.1	0.2	0.7

5.3.3.3 Access Roads

The access roads impacts have been identified for areas outside the Solar Production Areas (outside fenced areas) and are presented in Table 5.3.1. Access roads were estimated to be approximately 16 feet wide, located mostly within existing agricultural lands. Access roads may be comprised of a combination of temporary construction matting and grass/unimproved pathways. If areas are identified as having soil strength limitations to support construction vehicles where vehicle traffic will be more frequent (i.e. site approaches), aggregate materials may be used.

Impacts to wetlands and waterways have been minimized to extent practicable, but due to the size of the facility and access needs, impacts to these features cannot be completely avoided. One access road is required within a forested wetland in the Alternate Project Area. For this access route, temporary construction matting will be used and tree clearing minimized to the extent possible. During operation of the project, the access will be maintained as a grass path and low ground pressure equipment will be used to cross this area when needed. Within the Primary and Alternate Project Area areas, open water areas that are associated with waterways/drainage ditches will be impacted by the installation of culverts at proposed waterway crossings. Please refer to Section 6 for details regarding the impacts to wetlands and waterways.

TABLE 5.3-4 ACCESS ROAD IMPACTS IN ACRES

Land Cover Classification	Primary Project Area	Alternate Project Area	Optional Project Area
Agriculture			
Row Crops	0.7	0.2	0.1
Hay/Pasture/Old field	0	0	0
Other Agriculture	0.5	0	0
Non-Agricultural Upland			
Prairie/Grassland	<0.1	0	0
Upland Woods	0	<0.1	0
Wetlands			
Non-Forested Wetlands (including open water)	<0.1	<0.1	0
Forested Wetlands	0	<0.1	0
Developed Land			
Residential	0.1	0	0
Commercial /Industrial (includes road ROW)	<0.1	0	0
Total	1.4	0.3	0.1

5.3.3.4 Crane Paths

This section does not apply to solar projects.

5.3.3.5 Substation

The proposed substation will have a footprint of 280 feet by 195 feet and will impact approximately 1.3 acres of other agricultural land located with the Primary Project Area. This area is currently under mint production. No wetland or waterway impacts are anticipated on the substation site.

5.3.3.6 Perimeter Areas

The Perimeter Areas of the Project are comprised of all areas within the site boundary that are not part of the Solar Production Areas, Collection System, Access Roads, and Substation. The Perimeter Areas include most of the existing forested and wetland areas of the site and will not be affected during construction. These areas will remain in greenspace during construction and project operation. No wetlands or waterways are anticipated to be impacted within the perimeter areas either during or after construction. BMPs will be employed to protect wetlands and waterways near the construction areas.

Some of the agricultural areas within the identified Perimeter Areas may be utilized for construction purposes, such as equipment access, temporary material storage, and for the laydown yard. Once construction has been completed, most agricultural areas will be seeded as described in Section 6.5.3.4. Seed mixes developed for the project are included in Appendix K. Larger contiguous areas may be farmed if determined to be practicable once the Project is in operation. For the purposes of determining impacts for the duration of the Project, all agricultural areas that are not farmed will be permanently impacted.

TABLE 5.3-5 PERIMETER ACRES

Land Cover Classification	Primary Project Area	Alternate Project Area	Optional Project Area
Agriculture			
Row Crops	89.9	30.1	38.5
Hay/Pasture/Old field	7.1	0.2	0.5
Other Agriculture	45.0	8.7	0
Non-Agricultural Upland			
Prairie/Grassland	4.8	0	0.3
Upland Woods	19.5	17.4	6.7
Wetlands			
Non-Forested Wetlands (including open water)	21.3	2.1	3.3
Forested Wetlands	0.6	3.0	0
Developed Land			
Residential	3.6	0	<0.1
Commercial /Industrial (includes road ROW)	6.7	0	0
Total	198.5	61.5	49.4

5.3.3.7 O&M Building

An O&M building is not proposed for the Project. However, the applicant will coordinate with the commission if it is determined will be needed in the future.

5.4 WILDLIFE

Wildlife habitat found within the Project Area was identified based on desktop habitat review, field investigations and observations, and state and federal information on threatened and endangered species.

5.4.1 Describe existing wildlife resources and estimate expected impacts to plant and animal habitats and populations.

The wildlife species that inhabit the proposed Project area are typical of those found in the Eastern Lake Section of the Central Lowland Physiographic Province of the United States. The Project area consists of agricultural fields, wetlands, and woodlands which provide suitable habitat for a variety of common Wisconsin wildlife and plant species. Typical mammals found in these habitats in southeast Wisconsin include white-tailed deer, common raccoon, coyote, eastern gray squirrel, groundhog, and opossum. Wildlife may utilize agricultural fields to travel between preferred habitat, which is typically field edges, fallow fields, forests and wetlands.

Numerous bird species may also be found in the Project area and vary depending on time of year. Several resource areas that provide habitat for birds occur within a mile of the Project area. These include the Lake Mills Wildlife Area, the Greater Lake Koshkonong Important Bird Area (IBA), and several parcels of Wetland Reserve Program (WRP) lands (Figure 4.1.6.3 in Appendix A). While these surrounding resource areas are comprised of natural areas and diverse wetland habitats capable of supporting various bird species of high conservation priority, the habitat within the Project area is dissimilar and not

considered suitable except for common bird species more typical of agricultural settings. Typical breeding bird species likely to occur within the Project area include red-tailed hawk, horned lark, tree swallow, American robin, gray catbird, common yellowthroat, song sparrow, and red-winged blackbird.

The Project is anticipated to have minimal negative impact on wildlife species and their preferred habitats since the majority of the Project area consists of actively tilled agricultural land. Anticipated impacts are generally expected to be of short duration and limited to the period of construction activities. After construction is complete, Badger State will revegetate the Project area with perennial grasses. A native prairie grasses, sedges, and forbs mix may be used in open spaces between panel blocks and areas between the perimeter fence and property boundaries as described in Section 6.5.3.4. It is anticipated that revegetation of the Project area with a permanent cover of native prairie vegetation will increase suitable habitat for a variety of wildlife species including pollinating insects, nesting birds, and small mammals.

In addition, all attempts were made during the preliminary engineering design process to maintain connectivity of woodland areas to the lands surrounding the project area. This purpose of this was to maintain possible use of these areas by larger mammals, such as whitetail deer, while keeping them segregated from the fenced solar areas.

The fence that will be used to surround and provide security to the photovoltaic panel areas will consists of a seven to eight-foot-high deer exclusion fencing. This type of fencing will provide for the passage of smaller wildlife such as possum, raccoon, and rabbit while keeping larger mammals such as whitetail deer excluded. The project substation will require a seven to eight-foot high chain link fence which may include three strands of barb wire at the top. A schematic of the proposed project fencing is found in Appendix B.

Because of these design approaches, it is anticipated that the project will not significantly affect existing animal populations.

5.5 PUBLIC LANDS

To assess the Project area for these resources, the following were reviewed: USGS Protected Areas Database of the U.S. (PADUS), USGS topographic maps, aerial photographs, agency databases, and the internet (i.e., Google Earth, Google Maps) for public lands, recreational sites, and other special use areas in the Project area. Badger State also consulted with U.S. Fish and Wildlife Service (USFWS) and WDNR for natural resource areas, such as FWS wetland easements and state lands, and contacted the planning department staff and reviewed the Jefferson County website for any special areas

In addition to public lands listed below, there are various private properties enrolled in state land management programs (such as Managed Forest Law and Forest Crop Law). These programs may allow public access for activities such as hunting and fishing. These private properties, as identified by the WDNR in their Managed Lands database, have been mapped for consideration within the Project area. A GIS file of public lands within two miles of the Project boundary, is included with this submission. A map showing federal, state, county and local properties within two mile of the Project area is included as Figure 4.1.6.3 in Appendix A.

5.5.1 State Properties, including: Wildlife Areas, Fisheries Areas, and State Parks

No state properties are located within the Project area. Four state owned or managed properties are within two miles of the project (see Figure 4.1.6.3 in Appendix A).

- Rose Lake State Natural Area, located 1.3-mile south of the Project area;
- Mud Lake Fen and Wet Prairie State Natural Area, located 1.7-mile northwest of the Project area;
- Lake Mills Wildlife Area, located 0.7-mile west of the Project area; and
- Glacial Drumlin State Trail, located 1.9-mile north of the Project area.

State natural areas (SNAs) protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations and archeological sites. Rose Lake is a shallow, hard water seepage lake surrounded by wetlands, oak openings, and steep hills and provides habitat for a variety of fauna.

Mud Lake Fen and Wet Prairie State Natural Area is situated on the south shore of Mud Lake and features a narrow band of calcareous fen adjacent to the inlet stream to Mud Lake which supports a diverse flora.

Lake Mills Wildlife Area is comprised of a diverse variety of habitat types currently covering approximately 3,300 acres. The habitat types include open water marsh, large areas of wet prairie, lowland hardwoods with tamarack and some oak savanna uplands.

The Glacial Drumlin State Trail is a 52-mile long bicycle trail that runs between Cottage Grove and the Fox River Sanctuary in Waukesha Wisconsin.

The project will likely not be visible from these properties due to distance, topography, and tree cover.

The WDOT manages land adjacent to the Project associated with U.S. Highway 18 and land associated with U.S. Highway 12 within two miles of the Project area. The WDOT owns and manages right-of-way associated with State Highway 89 adjacent to the Project area and State Highway 26 within two miles of the Project area.

5.5.2 Federal Properties including: Wildlife Refuges, Parks and Scenic Riverways

There are no federally-owned properties such as wildlife refuges, parks or scenic river ways located within two miles of the Project Area

Eight USDA NRCS Wetlands Reserve Program (WRP) lands are located within two miles of the Project Area (see Figure 4.1.6.3 in Appendix A). None of these lands or any easement conditions associated with these easements will be impacted by this Project. Access will remain open to the public.

- Four NRCS WRP parcels located adjacent to the Project area on the north and south sides of U.S Highway 18;
- Two NRCS WRP parcels, located 0.75-mile west of the Project area;
- One NRCS WRP parcels, located 0.80-mile northwest of the Project area; and
- Two NRCS WRP parcels, located 1.90-mile south of the Project area.

The WRP was a voluntary program that offered landowners the opportunity to protect, restore, and enhance wetlands on their property. The Agricultural Act of 2014 which establishes the Agricultural Conservation Easement Program (ACEP) repealed the WRP but does not affect the validity or terms of any WRP contract, agreement or easement entered into prior to the date of enactment on February 7, 2014 or any associated payments required to be made in connection with an existing WRP contract, agreement or easement.

The project will be visible from the WRP land located adjacent to the Project area adjacent to U.S. Highway 18. The project will likely not be visible from the remaining properties due to distance, topography, and tree cover. Potential impacts to vegetative communities, wildlife and sensitive species is discussed in sections 5.3, 5.4 and 5.9 respectively. Potential for impacts to waterways and wetlands is discussed in section 6.1 and 6.2 respectively.

5.5.3 County and Local Parks

No county or local properties are located within the Project area. Three county and one local property are located within two miles of the Project area (see Figure 4.1.6.3 in Appendix A).

- Dorothy Carnes County Park, located 0.75-mile south of the Project area;
- Crawfish River County Park, located 1.47-mile east of the Project area;
- Jefferson County Fair Park, located 1.77-mile east of the Project area; and
- Lake Management Preserve, located 1.40-mile west of the Project area.

The project will likely not be visible from these properties due to distance, topography, and tree cover and is not expected to impact recreational use of these areas.

5.6 LOCAL ZONING AND SAFETY

5.6.1 through 5.6.5

Sections 5.6.1 through 5.6.5 only apply to public utilities. Therefore, these sections are not addressed in this Application.

5.6.6 Provide a list of potential local issues normally associated with zoning, road use

5.6.6.1 Provide copies of all correspondence to and from local government pertaining to issues of zoning, safety, or local road use safety plans.

Communications with county officials regarding a Project Joint Development Agreement are ongoing.

5.6.6.2 Provide a discussion of how local concerns will be accommodated.

Badger State has met and coordinated with county and local planning and zoning staff to discuss zoning, land use and other local issues. Badger State will continue to work proactively with county and local staff

to identify and address issues and concerns should they arise. Further discussion regarding local government impacts and public outreach are provided in Sections 13 and 14.

5.7 LAND USE PLANS

Project facilities will be located in the Towns of Jefferson and Oakland within Jefferson County.

5.7.1 Through 5.7.4 County Recreation Plans, Farmland Preservation Plans, Highway Development Plans, Sewer Service Area Plans

Land use plans and zoning ordinances, including any County Recreation Plans, Farmland Preservation Plans, Highway Development Plans, Sewer Service Area Plans and relevant planning documents are listed in Table 5.7-1 and provided in Appendix E.

TABLE 5.7-1 LAND USE PLANS AND ORDINANCES

Government	Plan or Ordinance
City of Jefferson	City of Jefferson Comprehensive Plan, Adopted March 18, 2008, amended November 3, 2015
	City of Jefferson Comprehensive Park and Outdoor Recreation Plan, December 2018
Town of Jefferson	Town of Jefferson Comprehensive Land Use Plan 2010-2030
	Town of Jefferson Ordinance 04-16b Town Road Use Permits, Fees, And Agreements for Exceeding Weight Limits
Town of Oakland	Town of Oakland, Jefferson County, Wisconsin Comprehensive Plan 2008 - 2080
	Ordinance No. 36 - Building and Mechanical Code
	Ordinance No. 58 - Comprehensive Growth Plan of The Town of Oakland, Jefferson County, Wisconsin
	Ordinance No. 60 Driveway and Highway Access Permit Ordinance Town of Oakland, Jefferson County, Wisconsin
Jefferson County	Jefferson County Comprehensive Plan Ordinance 2011-23 Adopted February 14, 2012 Incorporating the September 12, 2011 Agricultural Preservation and Land Use Plan +Land Use Map
	Jefferson County Parks, Recreation and Open Space Plan, May 1, 2013
	Jefferson County Floodplain Ordinance Effective February 4, 2015
	Jefferson County Zoning Ordinance No. 11, Amended October 9, 2018

5.8 ARCHAEOLOGICAL AND HISTORIC RESOURCES

5.8.1 Historic and Archaeological Sites Potentially Affected

A due Diligence Archaeological Survey was conducted by Commonwealth Heritage Group, Inc. (Commonwealth) on behalf of Badger State from October through December 2018. The archaeological survey was conducted within a Project study area defined to include all areas of potential ground disturbance, encompassing a 1,856 ac (751 ha) Project study area. Additional archaeological investigations of the Project study area were conducted in areas identified by a predictive model developed for the Project as having a high potential for archaeological sites. The modeling and additional survey were part of a due diligence effort to ensure compliance with applicable federal and state historic preservation statues and to provide information regarding potentially significant archaeological historic

properties. Archaeological survey of High Priority areas identified by the model was conducted as part of a due diligence effort, and did not result in the identification of additional archaeological sites.

Background research resulted in the identification of three previously identified archaeological sites and one cemetery/burial site within the Project study area. Archaeological survey of the previously identified archaeological and cemetery/burial sites was conducted in compliance with Wisconsin Statutes §44.40 and §157.70. Wisconsin Statute §44.40 states that archaeological sites and above-ground architectural/historic resources can be protected during state agency activities (grants, funding, permits, ground disturbing projects) if the sites have been recorded with the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist. Wisconsin Statute §157.70 protects human burial sites on non-federal or tribal lands in the state from disturbances.

An architecture/history review of the Project area was conducted by Commonwealth in 2018 and 2019 accordance with Wisconsin Statute §44.40. Nine above-ground resources were identified in the Wisconsin Historic Preservation Database (WHPD) in the vicinity of the Project area. These nine resources were previously surveyed in 2013. That survey was vetted by the SHPO and completed to acceptable standards for regulatory compliance review. At that time, one resource was recommended potentially eligible for the National Register and the other resources were recommended not eligible.

Commonwealth conducted a field review of the previously surveyed above-ground resources in October 2018 and January 2019. This survey confirmed that the resource appearances are unchanged since they were last surveyed in 2013. There were no suggested changes to the previous National Register eligibility recommendations.

Table 5.8.1-1 lists the known sites located within the Project area. A version of this table which provides the location of each site is included as confidential information in Appendix L.

TABLE 5.8.1-1 POTENTIALLY AFFECTED ARCHAEOLOGICAL AND HISTORICAL SITES

Archaeological Sites
47JE0488
47JE0487
47JE0684
BJE0043
Architectural Sites
AHI #6525, House
AHI #6526, House
AHI #6527, House
AHI #6530, Schoolhouse
AHI #6565, House
AHI #224546, House
AHI #224547, Schoolhouse
AHI #224548, House
AHI #224730, House

5.8.3 Archaeological and Historic Site Locations in Which Construction Would Occur

- ***Archaeological Resources***

Archaeological surveys conducted for the Project resulted in the field verification of one archaeological site (47JE0488), a prehistoric lithic scatter, and one historic cemetery (BJE0043). The locations of two other previously identified archaeological sites (47JE0487 and 47JE0684) within the Project study area were not verified by the 2018 archaeological survey.

BJE0043 is an inactive catalogued cemetery. As it is currently mapped in the Wisconsin Historic Preservation Database (WHPD), approximately 5.5 m (18 ft) of the site's boundary intersects the Project study area, resulting in roughly 0.08 ac (0.03 ha) of the of the cemetery extending into the study area. The site was visually surveyed, at which time it was noted that both the graves and boundary of the cemetery are clearly marked and maintained. Graves within the cemetery do not appear to extend into the Project study area; however, some graves are close to the boundary. Badger State will avoid impacting the historic cemetery by maintaining a minimum 10 ft (3 m) buffer between proposed Project ground disturbing activities and the boundary of the cemetery.

Field surveys of site 47JE0488 determined that based on the low density and non-diagnostic nature of the recovered artifacts and their origin from disturbed contexts, the site is unlikely to possess the information potential or retain the integrity required for listing in the NRHP. Because of this, no additional archaeological investigations or protective measures were recommended.

- ***Architectural/Historical Resources.***

The results of the architecture/history review concluded that one potentially eligible property may be affected by the Project and that the other sites were recommended as not eligible. A Determination of Eligibility (DOE) was recommended if there will be effects to the potentially eligible property, and an assessment of effects would be required should the property be determined eligible for the National Register.

A Determination of Eligibility for listing on the National Register of Historic Places was conducted by Commonwealth in February 2019 for the potentially eligible property identified by the architecture/history review. Four criteria are used to evaluate the eligibility of properties (buildings, structures, objects, sites, and districts) for the National Register. To be eligible, a property must be associated with significant historic events or trends (Criterion A) or the lives of significant persons (Criterion B), possess significant design or construction value (Criterion C), or yield information important in history or prehistory (Criterion D). In addition to eligibility under one or more evaluation criteria, a property must also possess integrity, or the ability to convey its significance. There are seven aspects of integrity that are considered; location, design, setting, materials, workmanship, feeling, and association. A property must retain at least several, and usually most, of these qualities. The results of the determination concluded that the property is recommended eligible for the National Register under Criterion C: Architecture. The property is recommended not eligible for the National Register under Criterion A: History and Criterion B: Significant Person.

As defined in Wisconsin State Statute §44.31, “adverse effect” to a historic property means any of the following:

- Physical destruction, damage or alteration of any part of a property which would adversely affect the historic significance of that property.
- Isolation of a property from or alteration of the character of the property's setting when that character contributes to the property's qualification as a National Register-listed or -eligible property.
- Introduction of visual, audible or atmospheric elements that are out of character with a property or alter its setting.
- Neglect of a property resulting in its deterioration or destruction.

Commonwealth determined that because no project activities are proposed on the property, no physical destruction, damage, or alterations will occur. Similarly, no project activities are proposed that could alter the architectural character of the building on the property, which is what qualifies the property as eligible for listing on the National Register. The project will introduce solar module arrays on adjacent agricultural fields, but due to the existing dense vegetative buffer on the three sides of house, views of and from the house would largely be unchanged. To the other side, the nearest solar array to the house will be more than 500 feet away and would be obstructed from view by two of the barns on the property, as well as trees and other vegetation. In general, with the arrangement of solar modules arrays in rows across agricultural fields the project will appear mostly absorbed into the existing rural landscape and resemble the pattern of row and field crops. Lastly, the project will not result in the neglect of the property. As currently proposed, it appears the proposed Badger State Solar Project will not adversely affect the National Register-eligible house under Wisconsin Statute §44.40.

Pursuant to Federal and Wisconsin State laws, if grave markers or human skeletal remains are encountered during construction, all activities in the affected area will cease and the State of Wisconsin Burial Sites Preservation Office will be contacted for further instructions.

5.9 ER REVIEW – ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES AND COMMUNITIES

5.9.1 Provide a copy of the DNR approved ER review and all supporting materials

An ER Review was conducted for the Project to identify whether any state or federally-listed rare species, natural communities, or other natural features with element occurrence records may occur within one-mile of the Project area. A Certified Endangered Resources (ER) review was submitted to the WDNR on January 15, 2019. The results of the ER Review concluded that no actions need to be taken to comply with state and/or federal endangered species laws. The WDNR approved the ER review and provided concurrence and recommendations on January 23, 2019. Because ER review indicates that there are no required actions to “maintain compliance with State and Federal Endangered Resources laws,” we believe that no habitat assessment is needed for the Project.

Badger State conducted an informal consultation with the USFWS through the Information for Planning and Consultation online system on February 1, 2019. The Northern long-eared bat and eastern prairie fringed orchid were identified on the list provided. No suitable habitat for the eastern prairie fringed orchid is present within the Project area. Therefore, the Project is not expected to impact the orchid.

The Wisconsin Natural Heritage Inventory (NHI Portal) database contains all current Northern Long-eared Bat roost sites and hibernacula in Wisconsin. The NHI Portal was consulted for this project, and per U.S. Fish and Wildlife Service's 4(d) rule, it was determined that this project is more than 150 feet from a known maternity roost tree and is more than 1/4 mile from a known hibernacula.

In addition, this project is not located within a Rusty Patched Bumble Bee High Potential Zone. Therefore, the ER review concluded that this project can proceed without federal restrictions. The certified ER Review and the USFWS response is provided as confidential in Appendix M.

5.9.2 Include a map showing the location of endangered, threatened and special concern species and or their habitat, and natural communities identified on the ER Review that occur within a minimum of 1-mile of the proposed project area or as agreed to by the DNR.

(ER Reviews, supporting materials, and maps should be filed as confidential

documents.) A Confidential ER Map is included as part of Appendix M.

6.0 WATERWAY/WETLAND PERMITTING ACTIVITIES

- ***Section 6.0 covers information required by DNR for waterway, wetland, and erosion control permits. The following subsections apply to both proposed and alternate sites.***

Badger State retained the services of Stantec to identify wetlands and waterways within the Project Area. Wetland delineations were completed in accordance with the January 1987 Technical Report Y-87-1 entitled, "Corps of Engineers Wetland Delineation Manual" during the summer of 2018. Detailed information on wetland and waterways and the methodology used for the Project is provided in the Wetland Delineation Report, provided in Appendix I. A summary of the wetland communities located within the Project Area are provided in Appendix J, WDNR Table 2.

The Project Area does not contain sensitive wetlands as defined by 2015 Wisconsin Act 387, including state or federally listed waterways, trout streams, fisheries, wilderness areas, recreational areas, sensitive resources of state or federal concern, or other areas of special natural resource interest as outlined in NR 103.04, Wisc. Adm, Code. No permanent wetland fill is proposed as part of the construction of the Project.

The Primary Project area would require 10 waterway crossings, 4 of which are at existing culvert locations. The need for land clearing at waterway crossings is expected to be limited and no downstream impacts to waterways are expected during construction of the Project.

6.1 WATERWAY PERMITTING ACTIVITY

- ***For each access road, collector circuit, or other facility directly affecting waterways; identify and number all waterway activities, based on Table 1 (Supplement to DNR Form 3500-53). For each stream or waterbody provide site photos, the width at the top of the bank, and the slope of the banks at the proposed activity location. For each stream affected by activities occurring below the ordinary high-water mark, note the water and sediment quality and the potential for either to be contaminated. For each activity, note if the waterway is defined as an Area of Special Natural Resource Interest (ASNRI) under the provisions of Ch. NR 1 Wis. Admin. Code. If a temporary bridge is required for construction, identify the type of structure to be used. Use Table 1 as the format for completing this information request.***

Waterways have been avoided to the extent practicable, however due to the extensive drainage network and ditching onsite, waterway impacts cannot be completely avoided. The Project facilities that will require waterway crossings include access roads and the collection system. Other project facilities such as the panels and associated facilities and substation will not impact waterways. The proposed waterway crossings are necessary to meet project locational and constructability requirements of the Project.

The project intersects waterways at 33 locations within the Primary, Alternate, and Optional Project areas. Seventeen of the crossings would be completed by horizontal directional drill (HDD) methods for the collector system and would avoid impacting waterways. Twelve crossings are required for equipment access purposes and will require placement of a culvert and backfill. Four of the crossings are located at an existing culvert crossing location and would not require access improvements. These crossings are

detailed in WDNR Table 1 (Appendix J), and the crossing locations identified on Figures 6.3.1, 6.3.2, and 6.3.3 in Appendix A. A navigability determination request for these waterways is included in Appendix I. Photographs of each wetland are provided in the Appendix D of the Wetland Delineation Report in Appendix I of this application.

6.2 WETLANDS

- ***For each access road, collector circuit, or any other facility directly affecting wetlands; identify and number all wetland crossings. Insert this information in Table 1 as discussed above in directional order with the waterways.***

6.2.1 Identify all wetlands on a map using data from the Wisconsin Wetland Inventory (WWI) and identify any other wetlands or changes to WWI boundaries based on delineations using all forms and information required by and in accordance with the January 1987 Technical Report Y-87-1 entitled, "Corps of Engineers Wetland Delineation Manual," including relevant guidance documents. Wetland delineation reports should be submitted to the DNR as a hardcopy with the application. Electronic copies of wetland delineation reports (in MS Word format, or similar) may be submitted on a CD.

The wetlands within the Project area are mostly comprised of non-forested communities including wet meadow and farmed wetlands. The wetlands are further described in the Wetland Delineation Report in Appendix I. A summary of the wetland communities located within the Project Area are provided in Appendix J, WDNR Table 2.

The non-forested wetlands are commonly dominated by reed canary grass (*Phalaris arundinacea*), chufa, orange jewelweed, roughfruit amaranth (*Amaranthus tuberculatus*), stinging nettle (*Urtica dioica*), path rush (*Juncus tenuis*), giant ragweed, enchanter's nightshade (*Circaea canadensis*), red-root amaranth (*Amaranthus retroflexus*), spotted lady's thumb (*Persicaria maculosa*), cattail (*Typha latifolia*), barnyard grass (*Echinocloa crus-galli*), cinnamon willow herb (*Epilobium coloratum*), dark green bulrush (*Scirpus atrovirens*), Torrey's rush (*Juncus torreyi*), and sandbar willow (*Salix interior*). One wetland area also had a shrub component dominated by white mulberry (*Morus alba*) and gray dogwood (*Cornus obliqua*).

The forested wetlands that exist within the Project Area are either small isolated communities or are a minor component of the wet meadows described above. The forested wetlands are comprised of hardwood swamp communities dominated by Bebb's willow (*Salix bebbiana*), Eastern cottonwood (*Populus deltoides*), box elder, and American elm trees in the overstory. The dominant shrub/ground layer species include white mulberry, gray dogwood, red-osier dogwood (*Cornus alba*), common buckthorn, swamp dewberry (*Rubus hispidus*), American black currant (*Ribes americana*), fowl manna grass (*Glyceria striata*), reed canary grass, chufa, orange jewelweed (*Impatiens capensis*), giant ragweed (*Ambrosia trifida*), enchanter's nightshade (*Circaea canadensis*), and barnyard grass.

6.2.2 Wetland Crossings

Wetlands have been avoided to the extent practicable, however due to size and configuration of the Project within the landscape, wetland impacts are not completely avoidable. No permanent wetland fill is proposed as part of the construction of the Project. The Project will require temporarily impacting wetlands due to placement of construction matting for both panel facilities and access roads. Additionally, the collection system will require crossing wetlands by both HDD and trench methods.

6.2.2.1 Describe the length of each wetland crossing.

Impacts to wetlands are detailed in WDNR Table 1 (Appendix J)

6.2.2.2 For each crossing, identify wetland type using the WWI classification, and wetland type as identified by plant community type (floodplain forest, hardwood swamp, coniferous bog, coniferous swamp, open bog, calcareous fen, shrub swamp, alder thicket, shrub-carr, sedge meadow, shallow marsh, deep marsh, wet to wet-mesic prairie, fresh (wet) meadow, shallow open water communities, seasonally flooded basin).

Wetland characteristics including the WWI classification and wetland type are provided in WDNR Table 2 (Appendix J) and the Wetland Delineation Report (Appendix I).

6.2.2.3 Based on discussions with DNR staff during pre-application consultations, document the presence and percent cover of key wetland invasive species at each wetland crossing.

A description of wetlands including the presence of invasive species is provided in the Wetland Delineation Report (Appendix I) and are further described in Section 6.4.

6.2.3 Sensitive Wetlands

- ***Determine if any wetlands affected are considered sensitive including any wetlands in or adjacent to an area of special natural resource interest (NR 103.04, Wis. Adm. Code) including:***

6.2.3.1 Cold Water Community as defined in § NR 102.04(3)(a), Wis. Adm. Code, including trout streams, their tributaries, and trout lakes

6.2.3.2 Lakes Michigan and Superior and the Mississippi River.

6.2.3.3 State- or federally-designated Wild and Scenic River.

6.2.3.4 State-designated riverway.

6.2.3.5 State-designated scenic urban waterway.

Environmentally sensitive area or environmental corridor identified in an area-wide water quality management plan, special area management plan, special wetland inventory study, or an advanced delineation and identification study.

6.2.3.6 Calcareous fen.

6.2.3.7 State park, forest, trail or recreation area.

6.2.3.8 State and federal fish and wildlife refuges and fish and wildlife management area.

6.2.3.9 State- or federally-designated wilderness area.

6.2.3.10 State-designated or dedicated natural area (SNA).

6.2.3.11 Wild rice water listed in § NR 19.09, Wis. Adm. Code.

6.2.4.11 Surface water identified as outstanding or exceptional resource water in ch. NR 102, Wis. Adm. Code.

6.2.3.12 Other sensitive wetlands are deep marsh, northern or southern sedge meadow not dominated by reed canary grass, wet or wet-mesic prairie not dominated by reed canary grass, fresh wet meadows not dominated by reed canary grass, coastal marsh, interdunal or ridge and swale complex, wild rice dominated emergent aquatic, open bog, bog relict, muskeg, floodplain forest, and ephemeral ponds in wooded settings.

This text addresses Section 6.2.3 and its subsections. The Project Area does not contain sensitive wetlands, state or federally listed waterways, trout streams, fisheries, wilderness areas, recreational areas, sensitive resources of state or federal concern, or other areas special natural resource interest as outlined in NR 103.04, Wisc. Adm, Code.

As described in Section 6.2.1 above, the majority of the wetlands within the Project area are comprised of wet meadow and farmed wetlands. These wetlands are generally of lower-quality and dominated by invasive or non-native species. These wetlands have been impacted over time by adjacent intensive farming activities and extensive drainage manipulation.

6.3 MAPPING WETLANDS AND WATERWAY CROSSINGS

- ***For each facility (access road, collector circuit etc.) in or adjacent to wetlands or waterways, provide three (3) maps, as described in Subsections 6.3.1 – 6.3.3, for each location on 11x17 inch paper, each with the same scale.***

6.3.1 Recent air photo showing only the proposed facility (access road, crane path, collector circuit, substation etc.) crossing or adjacent to wetlands or waterways.

6.3.2 Topographic map showing the facility (road, crane path, collector circuit etc.) crossing or adjacent to wetlands or waterways.

6.3.3 Recent air photos showing the locations of the following items:

6.3.3.1 Facility crossing or adjacent to wetland or waterway.

6.3.3.2 Waterways.

6.3.3.3 WWI (as a transpicuous layer).

6.3.3.4 Delineated Wetlands (clearly marked).

6.3.3.5 Hydric soils- (as a transpicuous layer) indicated faintly to be used as secondary review, if needed.

6.3.3.6 Proposed temporary bridge locations (labeled to correlate with Table 1).

6.3.3.7 Locations for other Chapter 30 activities such as grading or riprap (labeled to correlate with Table 1).

Project maps depicting the information in Section 6.3.1 through 6.3.3 are provided as Figures 6.3.1, 6.3.2, and 6.3.3 in Appendix A. These figures display Project facilities, WWI data, delineated wetlands, streams and ponds (per Wisconsin 24k Hydrography Database), elevation contours, hydric soils, wetland and waterway crossings and other activities related to the Chapter 30 permit.

6.4 WATERWAY/WETLAND CONSTRUCTION METHODS

Wetlands and waterways have been avoided to the extent practicable, however due to size and configuration of the Project within the landscape, impacts to these features are not completely avoidable. Impacts to wetlands and waterways are described further in the sections that follow.

6.4.1 Waterway Crossings – Construction Methods

The Project intersects waterways at 33 locations within the Primary, Alternate, and Optional Project areas. Seventeen of the crossings would be completed by horizontal directional drill (HDD) methods for the collector system and would avoid impacting waterways. Twelve crossings are required for equipment access purposes and will require placement of a culvert and backfill. Four of the crossings are located at an existing culvert crossing location and would not require access improvements. These crossings are detailed by Panel Facility Area in WDNR Table 1 (Appendix J), and the crossing locations identified on Figures 6.3.1, 6.3.2, and 6.3.3 in Appendix A.

6.4.1.1 Describe specific methods to be used for waterway crossings including location and methods of construction for:

6.4.1.1.1 Access Roads

There are 16 locations where access roads are required across identified waterways. Four of these crossings are at existing culvert locations and would not require any modifications to facilitate equipment crossings. The other 12 locations would require the installation of culverts for new waterway crossings.

The Primary Project area would require 10 waterway crossings, 4 of which at the existing culvert locations. These crossings would impact 0.06-acre (2,724 square feet) of waterways for culvert and backfill placement. The Alternate Array Area would require 5 waterway crossings. These crossings would impact 0.04-acre (1,864 square feet) of waterways for culvert and backfill placement. The Optional Area would not require waterway crossings.

6.4.1.1.2 Collector System

There are 17 locations where the collection system will cross waterways. The Primary Project area would cross 10 waterways, Alternate Area would cross 5 waterways, and the Optional Area would cross 2 waterways. Collector lines crossing waterways will be installed by means of HDD, thus avoiding direct waterway impacts.

6.4.1.2 Describe the method of crossing including structure type if applicable.

Access roads across waterways will utilize a metal corrugated culvert to maintain waterway flow and hydrology. As described above, some access roads will utilize existing crossings that will not require any improvement. New waterway crossings will require the installation of culverts for the access roads. The collector system will be installed by use of HDD methods.

Proper erosion control devices in the form of silt fence, straw bales, surface roughness and temporary seeding will be used to stabilize disturbed areas near waterways during construction and following the completion of the work. Monitoring of disturbed areas will occur until these areas have stabilized to 70% vegetative cover.

HDD construction methods are described in section 6.4.1.5 below.

6.4.1.3 Describe cleaning of machinery to prevent spread of invasive species.

Equipment will be cleaned before mobilization to the site to prevent introduction of invasive species from off-site sources. The equipment will be manually cleaned of plant materials between work zones within the Project Site. Additionally, any equipment working below the OHWM of waterways will be decontaminated using the appropriate BMPs.

6.4.1.4 Describe the proposed area of land clearance and disturbance at waterway crossings and the types of equipment proposed for the work.

The need for land clearing at waterway crossings is expected to be limited. Most waterway crossing locations are comprised of herbaceous vegetation with a lesser amount of tree and shrub growth. Where needed, vegetation clearing will be facilitated by hand clearing and limited equipment use.

6.4.1.5 In the case of underground construction for collector circuits, describe the proposed method for crossing the stream or river. For boring operations, provide the size, depth and location of boring pits and the estimated amount of excavated materials that will result.

HDD methods will be utilized for underground construction of collector circuits crossing waterways. Entry points and exit points will be located within upland areas a minimum of 10 feet from the edge of the waterway and will be moved further away when appropriate to achieve the proper depth required for each bore. Installation depths will be at least five feet below the bottom of the wetland or water crossing.

Silt fence or similar erosion control devices will be located between the disturbance and nearby waterways. Adequate supplies of containment materials will be kept at HDD bore sites to be used in the event of an inadvertent release of drilling mud (frac out). Proper erosion control devices in the form of silt fence, straw bales, surface roughness and temporary seeding will be used to stabilize disturbed areas near waterways during construction and following the completion of the work. Monitoring of disturbed areas will occur until these areas have stabilized to 70% vegetative cover. Engineering plan typical boring and pit details are presented in Appendix B.

6.4.1.5.1. Describe methods for de-watering of boring pit. Include a discussion of discharge locations and suspended solids standards for discharge water.

Dewatering activities may be necessary during construction. Water pumped during these activities will be discharged into upland vegetated areas, as described in Section 6.7. These activities will comply with the standards and methodologies as presented in the WDNR Technical Standard 1061.

6.4.1.5.2. Identify contingency plans for bore refusal and frac-outs if directional boring is proposed. Provide scaled pre and post- Project diagrams for all crossings including top view and cross section or side views.

Written site-specific contingency plans for a frac-out event will be developed and kept at the Project site. A standard frac-out plan is included in Appendix N.

6.4.2 Wetland Crossings – Construction Methods

Wetlands have been avoided to the extent practicable, however due to size and configuration of the Project within the landscape, wetland impacts are not completely avoidable. The Project will require temporarily impacting 15 wetlands due to placement of construction matting for both panel facilities and access roads; and for trenching due to construction of the collection system. Additionally, the collection system will require crossing 2 wetlands by HDD methods. The Project requires a total temporary wetland impact of 7.21 acres (314,027 square feet). The wetlands to be impacted by the Project are primarily

comprised of farmed wetland and wet meadow communities. These impacts to wetlands are detailed in WDNR Table 1 (Appendix J) and described further in the sections below.

6.4.2.1 Describe specific methods to be used for wetland crossings including location and methods of construction for:

6.4.2.1.1. Panel Facilities

A total of 13 wetlands would be temporarily impacted during construction by placement of matting for the installation of panel facilities. The Primary Project area would temporarily impact 4.47 acres (194,565 square feet) within 10 wetlands. The Alternate Area would temporarily impact 0.77-acre (33,586 square feet) within 3 wetlands. No wetlands would be temporarily impacted during panel construction within the Optional areas.

As described in Section 2.4.1, the Project will typically use driven pier foundations. These foundations avoid direct discharge to wetlands, therefore no permanent fill associated with the panel facilities are proposed as part of the Project.

The wetlands to be impacted by the panel facilities are primarily comprised of farmed wetland and wet meadow communities, and are further described in WDNR Table 2, Appendix J.

6.4.2.1.2. Access Roads

One wetland (W34) will impacted by an access road for the Alternate Area. The access road would require the placement of construction mats during construction, resulting in 1.75 acres (76,091 square feet) of temporary impact. This wetland will also require some limited tree clearing for the access path, resulting in 0.06-acre (2,530 square feet) of forested wetland conversion. Once construction is completed, any access required during the operation of the project would be completed by utilized by low ground pressure equipment. Permanent fill placement for this access road is not proposed.

6.4.2.1.2. Collector Circuits.

A total of 4 wetlands will be impacted by construction of the collector circuits. Two wetlands (W10 and W41) would be crossed by HDD methods for the Primary Project area. One wetland (W33) would be crossed by trenching for the Alternate Area resulting in 0.03-acre (1,458 square feet) temporary impact; and one wetland (W39) would be crossed by trenching for the Optional Area resulting in 0.19-acre (8,327 square feet) temporary impact.

6.4.2.2 Describe cleaning of machinery to prevent spread of invasive species.

Equipment will be cleaned before mobilization to the site to prevent introduction of invasive species from off-site sources. The equipment will be manually cleaned of plant materials between work zones within the Project Site. Additionally, any equipment working below the OHWM of waterways will be decontaminated using the appropriate BMPs.

6.4.2.3 Describe the proposed area of land clearance and disturbance at wetland crossings and the types of equipment proposed for the work.

The need for land clearing at within wetland areas is expected to be limited. Most wetlands that will be impacted by construction activities are currently farmed or are comprised of herbaceous vegetation. Where needed, localized trees or shrubs will be removed by hand clearing and limited equipment use.

6.4.2.4 Describe methods and discharge locations for site de-watering, and locations for stockpile of fill materials.

Dewatering activities may be necessary during construction. Water pumped during these activities will be discharged into upland vegetated areas, as described in Section 6.7, and will comply with the standards and methodologies as presented in the WDNR Technical Standard 1061.

Any stockpiles of fill will be place in upland areas outside of established wetland boundaries. Additional information regarding materials management are contained in Section 6.6.

6.4.2.5 In the case of underground construction for collector circuits, describe the proposed method for crossing the wetland. For boring operations, provide the size, depth and location of boring pits and the estimated amount of excavated materials that will result.

HDD and trench methods will be utilized for underground construction of collector circuits crossing wetlands. For the HDD methods, entry points and exit points will be located within upland areas a minimum of 10 feet from the edge of the wetland and will be moved further away when appropriate to achieve the proper depth required for each bore. Installation depths will be at least five feet below the bottom of the wetland or water crossing. Engineering plan typical boring and pit details are presented in Appendix B.

Silt fence or similar erosion control devices will be located between the disturbance and nearby waterways. Adequate supplies of containment materials will be kept at HDD bore sites to be used in the event of an inadvertent release of drilling mud (frac out). Proper erosion control devices in the form of silt fence, straw bales, surface roughness and temporary seeding will be used to stabilize disturbed areas near wetlands during construction and following the completion of the work. Monitoring of disturbed areas will occur until these areas have stabilized to 70% vegetative cover.

In the locations were the collector circuits will be trenched, topsoil will be removed and segregated prior to installation. An approximate 6 feet wide trench will be excavated, and the materials stockpiled in a nearby upland location. Once the circuits are installed, the trench will be backfilled and restored to match existing topography. Proper erosion control devices in the form of silt fence, straw bales, surface roughness and temporary seeding will be used to stabilize disturbed areas near wetlands during construction and following the completion of the work. Monitoring of disturbed areas will occur until these areas have stabilized to 70% vegetative cover.

6.4.2.5.1. Describe methods for de-watering of boring pit. Include a discussion of discharge locations and suspended solids standards for discharge water.

Water pumped during these activities will be discharged into upland vegetated areas, as described in Section 6.7 and will comply with the standards and methodologies as presented in the WDNR Technical Standard 1061.

6.4.2.5.2. Identify contingency plans for bore refusal and frac-outs if directional boring is proposed. Provide scaled pre and post- Project diagrams for all crossings including top view and cross section or side views.

Written site-specific contingency plans for a frac-out event will be developed and kept at the Project site. A standard frac-out plan is included in Appendix N.

6.5 EROSION CONTROL AND STORM WATER MANAGEMENT PLAN

Once the Project is authorized, Badger State will submit a Water Resource Application for Project Permits (WRAPP) to the WDNR in accordance with Wis. Admin. Code § NR 216. The application will include a site-specific Erosion Control and Storm Water Management Plan. The Plan will include technical drawings and descriptions of the BMPs that will be followed in compliance with WDNR technical standards.

A general outline of the Erosion Control Plan follows.

6.5.1 Erosion Control Methods and Materials

See Appendix N for the preliminary Erosion Control Plan and Storm Water Management Plans.

6.5.1.1 Soil and slope stabilization

To minimize any potential for soil erosion from wind and water, Badger State will install temporary and permanent erosion control devices as specified in the Erosion Control and Storm Water Management Plan and applicable permits. Temporary erosion control measures, including sediment filter devices (e.g., wattles or silt fence), will be installed immediately following initial ground disturbance. Mulch or other wildlife-suitable erosion control matting may be used on steep slopes (greater than 3:1 slope) to prevent erosion during construction. The temporary erosion control devices will be inspected on a regular basis and after each rainfall event of 0.5 inch or greater, to ensure controls function properly.

Following construction, disturbed areas will be seeded, and mulched and permanent erosion controls will be installed. The effectiveness of revegetation and permanent erosion control devices will be monitored by the long-term operation and maintenance of the facility. Erosion control devices will be maintained until the site is successfully re-vegetated. Following successful revegetation of construction areas, temporary erosion control devices will be removed.

6.5.1.2 Seeding and mulching

After site grading is complete, a temporary cover of oats or annual rye will be planted to prevent soil erosion during construction. Upon completion of construction all disturbed areas will be seeded with a

perennial seed mix that complies with Wisconsin Administrative Code Chapter ATCP 20.01 regarding noxious weed seed content and labeling. Permanent seeding will comply with WDNR Conservation Practice Standard 1059 Seeding for Construction Site Erosion Control.

Revegetation of the site is described further in Section 6.5.3.5. All disturbed portions of the site receiving seeding will be mulched, except for any areas where steep slopes are present. If steep slopes are present, wildlife compatible erosion control blanket will be installed. Mulch will comply with the WDNR Conservation Practice Standard 1085 Mulching for Construction Sites.

6.5.1.3 Matting, tracking pads, silt fences, stockpile protection

Construction mats will be used to reduce impacts to wetlands. The use of the construction mats in wetlands will be determined by an examination of site-specific soil stability and moisture content at the time of construction. Where possible, low ground pressure tracked equipment will be used to further minimize the use of construction mats and surficial wetland impacts. Tracking pads will be constructed at site access points to prevent soil and mud being tracked onto adjacent roadways.

Silt fence will be installed adjacent to earthwork locations where the existing vegetation is removed. Significant material stockpiles are not expected for this project, however, if stockpiles are required, they will be protected from erosion by a row of silt fence installed along downstream sides. Refer to the Erosion Control Plan in Appendix N for additional BMP detail regarding use of silt fence and stockpile protection.

6.5.1.4 Dewatering-related erosion and sediment control

If dewatering or pumping of water is necessary, all water from dewatering or trench draining activities will be discharged in a manner that does not cause nuisance conditions. Dewatering activities will not cause erosion in receiving channels, on downslope properties, or inundation in wetlands causing significant adverse impact to the wetland. If the discharge from the dewatering or pumping process is turbid or contains sediment-laden water, it will be treated through use of sediment traps, vegetative filter strips, flocculants, or other sediment reducing measures such that the discharge is not visibly different from the receiving water.

6.5.1.5 Channel protection

The lower sections of the project site are bounded by farm drainage ditches. The continued unimpeded functionality of the drainage ditches is critical to the performance of this Project as well as surrounding agricultural uses. Channels will be protected from low-impact uses (panel installation and access road gravel placement) by the use of permanent filter strips. Channels will be protected from high-impact uses (site grading) by the use of silt fence and filter strips.

6.5.1.6 Any other appropriate erosion control measures

See Erosion Control Plan/erosion control site map in Appendix N for additional detail.

6.5.1.7 Details and typical section drawings of all the erosion control methods utilized

The details and typical section drawings of all erosion control methods utilized are included in the Erosion Control Plan included in Appendix N.

6.5.2 Erosion Control Measure Site Plan

6.5.2.1 Construction site boundary

Exhibits provided in Appendix B of the Erosion Control Plan include maps of the construction site boundary, the location of all erosion control measures, the locations of stockpiled soil, vehicle equipment access sites, areas of disturbance, and drainage area configuration. The project site will be accessible from U.S. Highway 18, County Highway G, County Highway J, and County Highway Q.

6.5.2.2 The location of all erosion control measures.

Preliminary erosion and sediment control BMP locations are available in Appendix B of the Erosion Control Plan included in Appendix N of this application.

6.5.2.3 Location of stockpiled soil.

No significant areas of stockpiled soil are expected on this project. A small topsoil stockpile may be constructed at the proposed Sub-Station site.

6.5.2.4 Vehicle and equipment access sites.

Rock pads will be installed at site exits prior to grading activity. Locations of vehicle and equipment access sites are available in the Erosion Control Plan (Appendix N).

6.5.2.5 Areas of disturbance.

The proposed Project will disturb an estimated 1,473 acres for the construction of solar panels, an associated collector system, access roads, and security fencing around the perimeter within the Primary, Alternative and Optional Project areas and is described in detail in Section 5.3.3. The proposed construction activities are provided in the Project Area maps in the Erosion Control Plan (Appendix N).

6.5.2.6 The drainage area configuration.

The Project Area is located within four Hydrologic Unit Code (HUC) 12 watersheds; City of Jefferson-Rock River, Fort Atkinson-Rock River, Rock Creek, and Crawfish River. The Project Area drainage maps are available in the Erosion Control Plan (Appendix N).

6.5.2.7 Surface water diversion measures

No surface water diversion methods will be utilized. Sheet flow draining from surrounding properties will not be blocked or re-directed. Sheet flow draining from this project site will be treated with vegetated buffers before it leaves the site.

6.5.2.8 Topography

The surface topography of the Project area is predominantly closed depressions with minor amounts of gently rolling hills and plains, reflecting the underlying bedrock and glacial ground moraine deposits. The surface features were formed from deposition and erosion during periods of glaciation. The elevation ranges from 255 to 305 meters (840 to 1000 feet) above sea level. The Project area is primarily within closed depressional areas with slope gradients less than 2 percent. The western portion of the Project area is slightly more gently sloping in nature, with slopes ranging from 0 to 15 percent.

6.5.2.9 Existing floodplains and wetlands

The entire site lies in FEMA flood zone "X" which indicates an area of minimal risk and is outside the 1 percent and 0.2 percent annual chance floodplains (100 and 500-year floodplains). A wetland and waterbody delineation were completed for the Project in 2018. The extent and type of wetlands within the Project area are discussed in Section 6.2. Wetlands and waterbodies within the Project area will be protected during construction and operation of the facility by BMPs described in the Erosion Control Plan (Appendix N).

6.5.2.10 Location of trees and unique vegetation

The results of the environmental review conducted for the project and approved by the WDNR did not identify any unique vegetation or natural communities within the Project area. Anticipated tree clearing within the project area will be limited to that incidental to provide for access or collector line placement. Significant tree clearing for the project is not expected.

6.5.3 Sequence of Erosion Control Measures

6.5.3.1 Clearing and grubbing

The majority of the site will not require clearing and grubbing due to the existing condition of the site being tilled agricultural fields. It is expected there will be approximately 2.5 acres of clearing and grubbing necessary within the Primary Project area, 1.2 acres within he Alternate Area, and 0.8 in the Optional Area. However, not all of these Arrays will be developed and not more than 2.0 acres of tree clearing would be conducted for the Project.

6.5.3.2 Material installation

Appendix B of the Erosion Control Plan included as Appendix N of this application contains Wisconsin DNR BMP standards that describe in detail how BMP materials are to be installed.

6.5.3.3 Channel construction

No new swales or channels are anticipated for this project. Existing waterways, mostly consisting of farm drainage ditches, will be protected from erosion using vegetated buffers and slit fence.

6.5.3.4 Revegetation processes

Portions of the site not utilized for the Project facilities or not impacted during construction will remain vegetated. These areas include most wetlands, forested lands, and other perimeter areas of the site. Agricultural areas that have limited vegetation and areas disturbed by construction will be seeded and stabilized throughout construction. To the extent possible, disturbance during construction will be phased to limit the amount of bare soil onsite at any one time. Construction of the project will occur in five phases as described below.

Phase I

Initial Stabilization

- Prior to construction, the project area will be fallow cropland.
- Seed entire Project area, including vegetative buffers, with a temporary annual seed cover (i.e. oats) that will not compete with the permanent seeding to be established post construction.

Phase II

Pre-Grading BMPs

- Install perimeter control including silt fence and rock construction entrance taking care not to disturb vegetative buffers planted in Phase I.
- Install all other erosion control BMPs that will not be affected by site grading.
- Initial erosion control devices will be left in place until final stabilization is achieved.

Phase III

Site Grading

- Grading may be conducted in select areas on site. If topsoil is stripped during grading, it will be appropriately segregated, and it will be immediately respread over the graded area at the completion of grading rather than stockpiled.
- It is not anticipated that gravel will be necessary for access roads. However, if gravel roads are constructed, topsoil will be stripped and will be re-spread elsewhere onsite.
- Begin temporary stabilization and seed of graded areas that will not be disturbed for a period of 14 days.
- Complete any BMP installation that was required to be done after grading is complete.

Phase IV

Solar Construction

- After completion of the site work, construction of the solar features will begin with pile driving. Piles will be directly driven with no excavation required.
- Trenching for underground electrical will commence at the completion of pile driving. Any stabilized ground that is disturbed by the trenching process will be re-stabilized if construction disturbance is not expected to resume for a period of 14 days.

Phase V

Final Stabilization

- Initiate permanent seeding.
- Once permanent seed is established at a uniform 70% coverage, remove all temporary control BMP's and stabilize any areas disturbed by their removal.
- Monitor stabilized areas until final stabilization is reached.

6.5.3.5 Seeding and mulching/matting

After site disturbance and construction is complete in an area, a temporary cover of oats or annual rye will be planted to prevent soil erosion during construction. Upon completion of construction all disturbed areas will be seeded with a perennial seed mix that complies with Wisconsin Administrative Code Chapter ATCP 20.01 regarding noxious weed seed content and labeling. Permanent seeding will comply with WDNR Conservation Practice Standard 1059 Seeding for Construction Site Erosion Control.

All disturbed portions of the site receiving seeding will be mulched, except for any areas where steep slopes are present. If steep slopes are present, wildlife compatible erosion control blanket will be installed. Mulch will comply with the WDNR Conservation Practice Standard 1085 Mulching for Construction Sites. Temporary erosion and sediment control BMPs will remain in place until 70 percent of the permanent vegetation is established.

Once the Project is authorized, Badger State Solar will develop a site-specific revegetation plan that will outline seed mixes, installation and establishment details, and proposed long-term vegetation management specifications.

6.5.4 Off-Site Diversion Methods

No off-site diversion methods are anticipated to be used for this project. The following text addresses Sections 6.5.4.1 through 6.5.4.3.

6.5.4.1 Identify off-site contributions of water affecting project construction sites

All existing drainage patterns will be maintained for the solar project. There are no significant concentrated flow points which will have adverse effects on the project. General drainage patters are shown on the Erosion Control Plan.

6.5.4.2 Methods of controlling off-site water contributions

Off-Site water will be treated with on-site water. There are no special procedures for off-site water.

6.5.4.3 Site plan indicating:

6.5.4.3.1 Where the off-site water is originating from

Off-site water is shown on the Erosion Control Plan. There are no Diversion Measures planned for this project.

6.5.4.3.2 Locations of diversion measures on-site

There are no Diversion Measures planned for this project.

6.5.5 Provisions for Inspection and Maintenance

6.5.5.1 The regular inspection of all erosion control efforts per the requirements of Wis. Admin. Code § NR 216.

6.5.5.1.1 Identify who will perform the inspections.

Erosion Control Measures will be inspected continuously by the contractor in various areas of construction activity. As deficiencies are noted, they will be reported to the owner and will be repaired as quickly as possible. Where additional measures are required, they will be installed by the contractor to meet the requirements of the WPDES permit for the project.

6.5.5.1.2 Specify when the inspections will occur.

Erosion control will be inspected and repaired continuously throughout the construction phase of the project.

6.5.5.1.3 Any special circumstances initiating an inspection.

Complete inspection will be performed by the contractor within 24 hours of 0.5 inches of rainfall on the site.

6.5.5.2 The regular maintenance of all erosion control efforts.

The construction contractor will be required to inspect all erosion prevention and sediment control BMPs and pollution management measures to ensure integrity and effectiveness during all routine and post rainfall event inspections.

6.5.5.2.2 Specify corrective actions, if site is not maintained according to provisions.

Corrective actions will depend on the type of erosion control measure which is deficient and how it is failing. Erosion control measures can be cleaned, replaced, repaired or enhanced depending on the need.

6.5.6 Post-Construction Stormwater Management

6.5.6.1 Develop a storm water management plan per the requirements of Wis. Admin. Code § NR 216.47.

A Stormwater Management Plan has been prepared for this project in accordance with Wisconsin Administrative Code Section NR 216. It is attached to this report as Appendix N.

6.5.6.1.1 Where applicable, describe and provide details on the best management practices that will be used to meet the performance standards of Wis. Admin. Code § NR 151.12.

BMPs shall be designed, installed and maintained to control total suspended solids (TSS) carried in runoff from the post-construction site by design, reducing, to the maximum extent practicable, the total suspended solids load by 80%.

In areas where solar panels and access drives are the only improvements, grassed buffer areas will be installed along the edge of the project area and adjacent to wetland areas to remove suspended solids. Additionally, the run-off from a field of solar panels will be constantly filtered by the vegetation planted throughout the site. The flow-lengths over the proposed access drives will be dwarfed by the flow lengths over the vegetated surfaces. Off-site stormwater impacts are not anticipated.

BMPs shall be employed to maintain or reduce the peak runoff discharge rates, to the maximum extent practicable, as compared to pre-development conditions for the 2-year, 24-hour design storm applicable to the post-construction site.

For all of the site, except for the sub-catchment containing the sub-station, the run-off curve number for the proposed grassed surface will be lower than the run-off curve number of the farm-field which it replaces. This means that the peak-discharge rates will be decreased. For the sub-catchment containing the sub-station, we are proposing a small detention pond which will reduce the peak run-off rate and reduce the TSS to conform to code requirements.

BMPs shall be designed, installed and maintained to infiltrate runoff to the maximum extent practicable in accordance with the following, except where the least permeable soil horizon to 5 feet below the proposed bottom of the infiltration system using the USDA method of soils analysis is one of the following: sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, or clay.

For this project, the combination of clayey soils and high ground water will preclude the success of practical infiltration practices and therefore the project is exempt from this requirement.

6.6 MATERIALS MANAGEMENT PLAN

Construction materials for the Project will be handled in accordance with the methodology outlined within this document and the preliminary Erosion Control Plan and Storm Water Management Plans, Appendix N.

6.6.1 Haul Routes

The following text provides the information requested in Sections 6.6.1 and its subsections.

6.6.1.1 Indicate how and where hauled materials will be routed, including:

The main haul route for construction materials will be along US Highway 18 (US 18) or State Trunk Highway 89 (STH 89) into the various panel areas. Each major panel area will have its own laydown yard.

Materials to be routed directly to individual panel areas will be determined upon selection of a final construction contractor and delivery contractor.

6.6.1.1.1. Inbound materials
6.6.1.1.2. Outbound materials
6.6.1.1.3. Clean fill materials
6.6.1.1.4. Contaminated materials
6.6.1.1.5. Others

Imported fill material is not expected to be required for Project construction, but if required it would follow the same haul routes as other materials. It is not anticipated that contaminated materials will be found during Project construction. In the unlikely event that contaminated materials are discovered they will be handled in a manner compliant with state and local regulations.

6.6.1.2 Alternate locations if necessary.

Alternate locations are not necessary.

6.6.1.3 Include a haul route diagram indicating haul route locations.

Haul routes, construction laydown and staging areas are discussed in Sections 2.3.5, 2.3.6 and 2.4.5.

6.6.2 Stockpile Areas

6.6.2.1 List and describe:

6.6.2.1.1. Material to be stockpiled.

Construction material stockpiles will be located at the construction laydown yard as discussed in Section 2.4.5.1. Soils stripped or removed due to grading and excavation will be separated into topsoil and subsoils and stored in upland areas only.

6.6.2.1.2. Where will material be stockpiled on-site.

Excavated Subsoils, if any, will be stockpiled near the laydown areas and used as backfill as needed. Topsoil will be used during the reclamation process for disturbed areas near panels and access roads. They will be shaped into screening berms for the life of the Project.

6.6.2.1.3. Measures to protect stockpiled areas, if applicable.

Any stockpiled materials will be protected with perimeter controls and temporarily seeded if stockpiled longer than 14 days.

6.6.2.2 Provide a plan view diagram indicating stockpile area locations.

See Sections 2.4.1 and 2.4.2 for a discussion of panel foundation construction and the handling of removed soils.

Sediment control measures will be in place prior to any removal of topsoil or grading work and will be maintained until the potential for erosion has stabilized. Stormwater and erosion control measures along with drawings of proposed BMPs are provided in the Erosion Control Plan Attachment E).

6.6.3 Equipment Staging Areas

6.6.3.1 Where equipment will be stored on-site

Equipment will be staged from the temporary laydown yard and individual panel staging areas as discussed in Section 2.4.5.

6.6.3.2 Include a plan view of equipment storage areas on-site

The temporary laydown yard and panel facility areas area shown on Figures 4.1.1 and 4.1.2, Appendix A.

6.6.3.3 Spill control and kits on-site

Spill control kits will be kept at the Project laydown yard and within construction vehicles. Badger State will acquire an SPCC Plan from the contractor awarded the construction contract. The SPCC Plan will outline the procedures and preventative measure that will be followed throughout the construction period.

6.6.4 Field Screening Protocol for Contaminant Testing

- ***If contaminated materials (i.e. soil) are encountered on-site, indicate:***

6.6.4.1 How will the materials be screened.

6.6.4.2 Where will the materials be tested.

6.6.4.3 What protocols will be followed.

6.6.4.4 How work will be impacted.

The following text provides the information requested in Sections 6.6.4 and its subsections. The Project area land use is predominantly agricultural. Farm owners typically store hazardous materials, such as fuels and chemicals within farm buildings such as barns and sheds. Therefore, it is unlikely these materials are encountered or disturbed during Project construction.

Contractors will be trained to identify potential contaminated materials. If encountered, Badger State will notify a firm experienced in the analysis and treatment of such materials if contaminated soils or materials are encountered during construction. The suspected materials will be tested, treated and disposed of according to the proper protocol for the situation encountered and the corresponding statutory requirements. The WDNR will be contacted as required under state statutes.

6.6.5 Estimated Types, Concentrations and Volumes of Contaminated Materials

- ***If contaminated materials are known to exist on-site, list and describe:***

6.6.5.1 The type of contaminant.

6.6.5.2 Where the contaminant is located on-site.

6.6.5.3 Media in which the contaminant is located within (i.e. soil, water, etc.)

6.6.5.4 The estimated concentration of the contaminant.

6.6.5.5 The estimated volumes of the contaminant.

The following text provides the information requested in Sections 6.6.5 and its subsections. As described in the preceding section, the Project area land use is predominantly agricultural. Farm owners typically store hazardous materials, such as fuels and chemicals within farm buildings such as barns and sheds. Therefore, it is unlikely these materials are encountered or disturbed during Project construction. Other than the materials utilized in the agricultural operations no hazardous materials are known on participating Project properties.

6.6.6 Methods for Dewatering of Excavated Materials

- ***If free water is found present in excavated materials, list and describe:***

6.6.6.1 What methods will be used to correct the situation (i.e. how will water be removed).

6.6.6.2 Where these methods will take place on-site.

The following text provides the information requested in Sections 6.6.6 and its subsections. If conditions warrant during construction, dewatering at panel locations may occur. The contractor will construct and maintain all dewatering BMP's necessary to comply with discharge requirements contained in local or state permits, ordinances, and rules. The contractor will consult with the engineer before constructing a dewatering device.

Excavated materials will be stored in upland areas away from wetlands and waterways. The dewatering of excavated materials will employ the use of filtration and erosion control devices, such as filter bags, straw bales, and geotextiles. These methods will control the release of water containing sediment from stockpiles and graded areas. Water will be released into upland areas only and prevented from directly entering wetlands or waterways.

6.6.7 Estimated Volumes of In-channel and Upland Excavated Materials

6.6.7.1 Volume of Dredged Materials (cubic yards)

6.6.7.2 Excavation from bed and bank of waterway.

6.6.7.3 Excavation from wetland.

The following text provides the information requested in Sections 6.6.7.1 and its subsections. Excavation of materials in wetlands and waterways will be minimized to the extent practicable. All waterways and most wetlands will not be impacted by collection system installation, due to the use of horizontal directional drilling methods. No excavation within wetlands or waterways will be impacted by panel construction.

The construction of permanent access roads will permanently impact farm drainage ditches or intermittent streams at 17 locations as described in Section 6.4. The total volume to be excavated from waterways for the installation of access road culverts is estimated at less than 5 cubic yards per culvert or less than 85 cubic yards. The material removed will be utilized as backfill within the construction site or disposed of as discussed in Section 2.4.1 of this application.

Excavation within 2 wetlands will be necessary for the installation of the collector system. The wetlands to be impacted are farmed. The Project collection system will be installed using trenching method. Topsoil will be segregated and temporarily stockpiled. Once the collector system is installed, the excavated materials will be backfilled, and topsoil replaced to match existing topography and contours. If necessary, any materials that cannot be backfilled will be utilized or disposed of as discussed in Section 2.4.1 of this application.

6.6.7.4 Volume of Upland Materials (cubic yards)

6.6.7.2.1. Excavation from areas outside of waterway and wetlands.

The following text provides the information requested in Sections 6.6.7.2 and its subsections. Upland excavation of approximately X miles of collector circuit will result in approximately xxx cubic yards of removed materials. The majority of material excavated during construction will be used as backfill during construction. Material not re-used in the construction process will be disposed of in upland areas as discussed in Section 2.4.1.

6.6.8 Estimated Volumes and Location of Re-used In-channel and Upland Excavated Materials

6.6.8.1 Reuse of Dredged Materials

6.6.8.1.1. Provide the total volume of reused dredged materials in cubic yards.

6.6.8.1.2. Provide the location either on Project plans or provide off-site address, property owner, and site map drawn to scale.

6.6.8.1.3. Provide the purpose of the dredged material usage (i.e. grading, trench backfill, etc.).

6.6.8.2 Reuse of Upland Materials

6.6.8.2.1. Provide the total volume of reused upland materials in cubic yards.

6.6.8.2.2. Provide the location either on Project plans or provide off-site address, property owner, and site map drawn to scale.

6.6.8.2.3. Provide the purpose of the upland material usage.

The following text provides the information requested in Sections 6.6.8 and its subsections. Badger State anticipates that the majority of material excavated during construction will be used as backfill during construction. Material not re-used in the construction process will be disposed of in upland areas as discussed in Section 2.4.1.

The Project collection system will be installed using a trenching method in upland areas. The process will result in minimal excess materials, as most excavated materials will be replaced as backfill into the opening. Bore pits excavated for the entrance and exit of the horizontal directional drilling components will be placed in upland areas. A typical bore pit is approximately 10 feet by 20 feet. Approximately 1600 cubic feet (60 cubic yards) of material may be excavated for each pit. All materials removed from bore pits will be used as backfill of the pit upon completion of the bore.

6.6.9 Off-site Disposal Plans for Contaminated or Non-contaminated Materials

6.6.9.1 Disposal of Dredged Materials

6.6.9.1.1. Total volume of disposed materials (cubic yards).
6.6.9.1.2. Disposal site location.
6.6.9.1.3. Type of disposal Site (i.e. confined disposal facility, landfill, etc.).
6.6.9.1.4. Disposal site name and address.

6.6.9.2 Disposal of Upland Materials

6.6.9.2.1. Total volume of disposed materials (cubic yards).
6.6.9.2.2. Disposal site location.
6.6.9.2.3. Type of disposal site (i.e. confined disposal facility, landfill, etc.).
6.6.9.2.4. Disposal site name and address.

The following text provides the information requested in Sections 6.6.9 and its subsections. Badger State anticipates that the majority of material excavated during construction will be used as backfill during construction. Material not re-used in the construction process will be disposed of in upland areas as discussed in Section 2.4.1. If contaminated materials are encountered, they will be disposed of in a manner compliant with state and local regulations, as outlined in Sections 6.6.4 and 6.6.5.

6.7 DEWATERING PLAN

- ***Provide details for pit/trench dewatering for collectors and for dewatering excavation for structure foundations. The following checklist serves as guidance in the completion of the Dewatering Plan necessary to meet the requirements of the Chapter 30 and NR 216 permits.***

Dewatering activities may be necessary during the excavation of panel foundations and digging of directional drill bore pits. Water pumped during these activities will be discharged into upland vegetated areas. The contractor awarded the construction contract will comply with the standards and methodologies as presented in the WDNR Technical Standard 1061.

6.7.1 Dewatering/Diversion of Flow

- ***Provide detailed plans for the dewatering/diversion of flow/standing water removal consistent with DNR Technical Standard 1061 for dewatering. Include typical dewatering/diversion measure plans with:***

6.7.1.1 Specifications for the dewatering/diversion of flow/standing water removal.

6.7.1.2 Methods employed to dewater/divert flow/treat water, if applicable.

6.7.1.3 Details of how methods will be employed.

6.7.1.4 Details of where methods will be employed.

6.7.1.5 Capacities and capabilities.

The following text provides the information requested in Sections 6.7.1 and its subsections. Pumping of water during construction of panel foundations and drill bore pits will be discharged into upland vegetated areas. The general guidelines that will be followed during these dewatering activities are as follows:

- Floats will be placed on pump intakes
- Discharges from settling or filtration devices will be directed to upland vegetated areas
- Soils in the vicinity of the discharge point will be assessed before discharge
- Discharge outlets will be protected from scouring
- Topography between the discharge point and the nearest receiving waters will be evaluated for erosion potential
- No water will be discharged to karst features, wetlands or waterways
- Settling or filtration devices may include:
  - settling basins or tanks
  - filter bags
  - straw bales or gravel bag structures

Construction of Project access roads will impact farm ditches and intermittent streams in 17 locations as identified during desktop reviews and field surveys. Field observations noted minimal standing water and/or minor dry weather flow associated with the features. Construction of culverts within these access roads may require temporary diversion of flow depending on the season of the year in which the construction is completed. Weather forecasts will be monitored in advance of these activities, and construction postponed if large rain or melt events are predicted.

Advanced dewatering techniques are not anticipated to be necessary during construction of the Project. The contractor will construct and maintain all dewatering BMPs necessary to comply with the discharge requirements contained in local or state permits, ordinances, and rules. The contractor will consult with the Project engineer before constructing a dewatering device.

6.7.2 Downstream Impact Minimization - List and describe methods of minimizing downstream impacts during high flow conditions.

The following text provides the information requested in Sections 6.7.2 and its subsections. No downstream impacts to waterways are expected during Project construction. As noted in Section 6.7.1 all dewatering discharges will be made to vegetated upland areas. Waterways with planned culvert installations carry minimal flow and will be monitored so that construction activities are not performed during high flow events.

6.7.3 Analysis of Possible System Overload Scenarios

6.7.3.1 Estimated volume of system overload (i.e. what rainfall overloads the system).

6.7.3.2 Estimated frequency of system overload (i.e. how often will the system be overloaded).

6.7.3.3 Actions taken if stream is to be overloaded.

The following text provides the information requested in Sections 6.7.3 and its subsections. As overload scenarios are not anticipated due to the limited flow of waterways near construction sites, no overload analyses were performed. If heavy rainfall or melt events are predicted, waterways will be monitored for possible near or overflow conditions. In the even that that overflow conditions are likely, construction activities near the affected waterway will be postponed.

6.7.4 Impacts of System Overload on Construction Activities and Water Quality

6.7.4.1 Anticipated number of lost work days.

6.7.4.2 Possible water quality impacts.

6.7.4.3 Methods of deterring adverse changes in water quality.

The following text provides the information requested in Sections 6.7.4 and its subsections. Badger State and its contractors will install erosion control devices and employ BMPs as described in the Stormwater and Erosion Control plan (Appendix N). These devices will be properly maintained, deterring sediment flow into wetlands and waterways near construction sites.

Construction activities will be postponed during extreme rain events, though natural overflow conditions may still result in sediment flow from existing agricultural use or prior construction activities. In an effort to minimize impacts, sediment control devices will be inspected weekly for integrity, and also following precipitation events producing 0.5 inches or more of rainfall within a 24-hour period as outlined in WDNR Technical Standards.

6.7.5 Water Discharge Locations

6.7.5.1 Where water will be discharged.

6.7.5.2 How water will be discharged.

6.7.5.3 A site map indicating discharge locations.

The following text provides the information requested in Sections 6.7.5 and its subsections. Water discharging may be necessary at bore pit locations. As these facilities are installed in upland locations, discharges will be made to nearby upland vegetated areas. No discharges will be made directly to wetlands or waterways; areas between discharge locations and sensitive resources will be assessed for infiltration capabilities.

Devices anticipated to be utilized include those listed in Section 6.7.1. Advanced sediment trapping practices are not anticipated; however, if needed the devices will comply with WDNR Technical Standards and be approved by the Project engineer.

6.7.6 Details of a Back-up System

6.7.6.1 What type of back-up system will be used (include backup and standby equipment/power supply).

6.7.6.2 Conditions when the system will be needed.

6.7.6.3 How the back-up system will operate.

6.7.6.4 Where the back-up system will be located.

The following text provides the information requested in Sections 6.7.6 and its subsections. The primary dewatering device will be electric pumps (powered by gasoline or diesel-powered generators) or a gasoline or diesel-powered pumping system. Back-ups will include additional similar pumps which will be stored on-site at the Project laydown areas.

6.7.7 High Flow Plan

6.7.7.1 How the water will be removed from the site.

6.7.7.2 Methods of water removal (e.g. pumping).

6.7.7.3 Methods of minimizing water contamination (e.g. treatment methods).

6.7.7.4 Protocol for evacuating materials from the flood conveyance channel including:

6.7.7.4.1. List of materials that would require evacuation during high flow periods.

6.7.7.4.2. How will the materials be evacuated from the flood conveyance channel.

6.7.7.4.3. Where will the materials be temporarily placed on-site.

6.7.7.4.4. How will the materials be transported.

6.7.7.4.5. Methods of protecting the materials.

6.7.7.4.6. Include a site map indicating the location of temporary placement.

6.7.7.5 Protocol for evacuating machinery from the flood conveyance channel including

6.7.7.5.1. Type of machinery that would require evacuation during high flow periods.

6.7.7.5.2. How will the machinery be evacuated from the flood conveyance channel.

6.7.7.5.3. Where will the machinery be temporarily placed on-site.

6.7.7.5.4. Include site map indicating possible locations of temporary machinery placement.

The following text provides the information requested in Sections 6.7.7 and its subsections. Due to the topography of the Project site and the low percentage of impervious area, flooding events are not anticipated. In the event of heavy rainfall, construction activities will be postponed. No panels or bore pits are located in flood plains. Soil and material stockpiles will be located in upland areas away from mapped flood plains. In the unlikely event of storage areas being inundated with flood waters, the materials will be relocated by truck via public roads to an appropriate alternative site within the Project boundary.

No vehicles or construction equipment will be stored within flood conveyance channels. In the event of high precipitation or a high-flow period, equipment will be kept out of possible flood conveyance channels and stored at the Project laydown areas.

6.7.8 Contaminated Water

- ***List and describe what measures will be taken if contaminated water is found on site including:***

6.7.8.1 Methods of isolating the contaminated water.

6.7.8.2 Methods of analyzing the contaminated water.

6.7.8.3 Where the water will be tested.

6.7.8.4 Methods of removing contaminated water from site.

6.7.8.5 How the water will be treated and disposed.

The following text provides the information requested in Sections 6.7.8 and its subsections. Due to the agricultural nature of the Project area, contaminated water is not expected to be encountered. If construction or agricultural activities cause a spill of hazardous fuels or if unexpected contamination is encountered the procedures outlined in the Project SPCC Plan will be followed. See Section 2.4.5.2 for a discussion of the SPCC Plan. Contaminated water and/or soils will be disposed of in a manner compliant with state and local regulations.

Adequate supplies of containment materials will be kept at Horizontal Directional Drilling (HDD) bore sites to be used in the event of an inadvertent release of drilling mud (frac-out). Written site specific contingency plans for a frac-out event will be developed and kept at the Project site.

7.0 AGRICULTURAL IMPACTS

7.1 INFORMATION ON FARMING ACTIVITIES IN PROJECT AREAS

The Project is being constructed predominantly on agricultural lands. Construction activities will be performed in a manner to minimize disruption of concurrent farming activity. Agricultural land that is converted to solar production areas and perimeter areas (typically land outside the fenced arrays) will be very suitable for a return to farming at the end of the life of the project as they will have "rested" for 30 years. Farm land that is compacted by heavy loads will be de-compacted in accordance with best management practices for agricultural lands. Topsoil stripped from construction areas will be stockpiled and used to restore impacted lands to agricultural productivity.

The proposed Badger State solar facility will remain vegetated throughout the year, in contrast to the current agricultural activities that expose large soil surfaces across participating parcels to both surface water and wind erosive forces. When the participating parcels are revegetated, infiltration of rainfall will increase, and the soil surface will remain covered and not exposed to water and wind erosion. Because of this, sediment load to nearby waterways will decrease significantly, thereby benefiting water quality.

7.1.1 Current Cropping Patterns

Crops predominantly grown within the Project boundary include corn, soybean, hay/silage, mint and wheat. Crops with the exception of mint are generally rotated according to agricultural practices for the area. Because the vast majority of the project land is flat, plow lines typically parallel the longest dimension of the field. Access roads are often located along an existing farm road or along field edges, providing more convenient and reliable access to distant fields. The final location of facilities will consider environmental and landowner concerns and will be approved by the hosting land owner.

7.1.2 Location of Drainage Tile or Irrigation Systems

The Jefferson County Farm Service Agency (FSA) office in Jefferson, Wisconsin was contacted regarding the location of drain tiles within the Project boundary. Individual land owners were consulted to gather relevant drain tile information. As final construction activities are presented to land owners, additional drain tile information will be requested and recorded. Further field investigation of drain tile networks may be warranted prior to construction. Drain tile locations in construction areas will be flagged and avoided to the extent practicable. Tiles determined to be damaged by construction activity will be repaired. Communication with the participating landowners will be maintained to ensure their satisfaction.

7.1.3 Farmland Preservation Agreements (FPA) for Proposed Sites

Land leased for the Project is zoned Exclusive Agriculture by Jefferson County, which complies with Wisconsin Farmland Preservation law, Wis. Stat. ch. 91. Utility use is permitted by the Jefferson County zoning ordinance in Exclusive Agriculture districts and by Chapter 91 of the Wisconsin Statutes within farmland preservation areas.

Jefferson County participates in the Farmland Preservation Program under the Wisconsin Working Lands Initiative which was passed as part of the state's 2009-2011 biennial budget, under Chapter 91 of the Wisconsin State Statutes. The main components of the program include 1) expansion and modernization of the State's existing Farmland Preservation (FPP) Tax Credit Program; 2) establishment of Agricultural Enterprise Areas (AEAs); and 3) development of a purchase of agriculture conservation easements program (PACE).

An AEA is an area of productive agriculture that has received designation from the State of Wisconsin at the request of landowners and local governments. Landowners within designated AEAs are eligible to enter into voluntary farmland preservation agreements. Review of Department of Agriculture, Trade and Consumer Protection (DATCP) online interactive mapping shows that no AEA lands are present within the Project area. Only one AEA is designated in Jefferson County, the Scuppernong AEA, and is located approximately 9.75 miles southeast of the Project Area at its nearest point.

It was determined through landowner discussions, that participating parcels within the project area have not been enrolled or have active contracts within in the Jefferson County Farmland Preservation Program. However, the project area is within an area where Farmland Preservation tax credits are available due to the existence of County zoning and the ability for landowners to be eligible if they meet other requirements such as maintaining a conservation plan, nutrient management plan, or proper erosion / manure control. If landowners have taken Farmland Preservation tax credits, these are applied to their previous year's taxes and have no bearing on future activities.

7.1.4 Conservation Reserve Program (CRP) Lands Inside the Project Boundary

Due to privacy concerns, the USDA does not release the names of participants in the CRP program. Information can be released for individual properties with written permission by the land owner. Participating lands in the Badger State Solar project are all under current agricultural use (with the exception of woodland areas). Field investigation and survey of existing land uses did not provide any evidence of CRP plantings on participating land parcels. Furthermore, based on discussions with landowners, it was determined that no participating parcels have active or future contracts under the CRP program. If it is determined that landowners have enrolled their property under CRP, Badger State will ensure all applicable properties are removed from CRP prior to construction, if required.

8.0 AIRPORTS AND LANDING STRIPS

The FAA website[2] was searched for registered airport listings of public airports near the Project site. Additionally, the Wisconsin Department of Transportation[3] (WisDOT) and several private sources of airport/airstrip information, such as Esri[4] and AirNAV[5] were searched. According to the sources listed there are no public or private airports within the Project boundary. The airports located within 10 miles of the Project and include the following: Fort Atkinson Municipal Airport (Fort Atkinson), Blackhawk Island Airport (Fort Atkinson), Christie Aerodrome (Fort Atkinson), J Rock (Fort Atkinson), Rockdale Airport (Rockdale), Tesmer Airport (Waterloo), Ha-Rail Airport (Lake Mills), Oakbrook Airport (Fort Atkinson), and Al's Airway Airport (Watertown). Fort Atkinson Municipal Airport is the only public airport, the remaining eight above listed airports are private. Additionally, attempts were made to determine if local land owners utilized crop dusting services within the Project boundary.

8.1 PUBLIC AIRPORTS

8.1.1 Identify all public airports inside the proposed project boundary.

There are no public airports within the Project area.

8.1.2 Identify all public airports within 10 miles of the project boundary.

Airports within a 10-mile radius of the Project are displayed on Figure 4.1.7.3 (Appendix A). A shapefile of the airport data acquired is provided on the data CD filed with this application.

8.1.2.1 Identify separately all public airports within:

8.1.2.1.1. 10,000 feet of the nearest panel

There are no public airports within 10,000 feet of the Project area.

8.1.2.1.2. 20,000 feet of the nearest panel

The Fort Atkinson Municipal Airport is located approximately 13,840 feet (2.6 miles) southeast of the Project area.

8.1.3 Describe any mitigation measures pertaining to public airport impacts.

Because the maximum height of the solar panels will be 10 to 12 feet aboveground, the Project will not interfere with airspace used by the above described airports. A glare analysis was conducted for the Project – an overview is provided in Section 12, and the full Glare Study in Appendix O. This analysis

[2] FAA - http://www.faa.gov/airports/airport_safety/airportdata_5010/
[3] WisDOT - http://www.dot.wisconsin.gov/travel/air/airportdirectory.htm
[4] Esri - http://www.esri.com/data/free-data/index.html
[5] AirNav, LLC. http://www.airnav.com/airports/

considered airports and predicts no appreciable impacts to airports. Therefore, mitigation measures pertaining to public airports are not planned at this time.

8.2 PRIVATE AIRPORTS/GRASS LANDING STRIPS

The FAA, WisDOT and sources listed in Section 8.1 were searched for listings of private airports and airstrips within ten miles of the Project. Airports within a 10-mile radius of the Project are displayed on Figure 4.1.7.3 (Appendix A). A shapefile of the airport data acquired is provided on the data CD filed with this application.

8.2.1 Identify all private airports/landing strips within the proposed Project boundary.

There are no registered private airports or airstrips listed within the Project boundary.

8.2.2 Identify all private airports/landing strips within two miles of the Project boundary

One private airport, Ha-Rail Airport is located within two miles of the Project area and is located approximately 0.95-mile north of the Project area. This airport operates a grass landing strip.

8.2.3 Provide the distance from each private airport/landing strip (ends of runway) to the nearest panel.

The nearest panel to the Ha-Rail Airport grass strip is located 4,085 feet (1,245 meters) at its nearest point

8.2.4 Describe any mitigation measures pertaining to private airport or airstrip impacts.

8.3 COMMERCIAL AVIATION

8.3.1 Identify all commercial air services operating within the Project boundaries (i.e. aerial applications for agricultural purposes, state programs for control of forest diseases and pests (i.e. Gypsy moth control).

There are no known, registered commercial air services operating within the Project boundary. The Wisconsin Department of Agriculture, Trade and Consumer Protection ("DATCP") and WDNR websites were searched for aerial application information. No commercial aerial pesticide applicators are listed in Jefferson County[6]. The Gypsy Moth control programs do not list Jefferson County as a current treatment area[7]. No other aerial application programs sponsored by DATCP, WDNR or Jefferson County were located in the search.

[6] DAPT - https://www.kellysolutions.com/WI/Applicators/searchbyCity.asp
[7] WDNR - https://gypsymoth.wi.gov/

8.3.2 Describe any potential impact to commercial aviation operations

Because no aerial services operate within the Project area or within the region surrounding the Project area, the maximum height of the solar panels will be 10 to 12 feet aboveground, and the glare analysis for the Project predicts no appreciable impacts to airports, no impacts to commercial aviation operations will occur.

8.3.3 Describe any mitigation measures pertaining to commercial aviation

Because no aerial services operate within the Project area or within the region surrounding the Project area the and no impacts are anticipated, mitigation measures pertaining to commercial aviation are not planned at this time.

8.4 EMERGENCY MEDICAL SERVICES – AIR AMBULANCE SERVICE

8.4.1 Identify the provider/s of air ambulance services within the Project Area

The closest air ambulance services provider to the Project Area is Flight for Life in Waukesha, Wisconsin located approximately 31 miles east of the Project boundary.

8.4.2 Describe any planned mitigation (e.g. establishment of safe landing zones, etc.).

The Project is not expected to affect the response capabilities of any emergency medical services including air ambulance services, therefore no mitigation is planned.

8.5 FEDERAL AVIATION ADMINISTRATION

The FAA regulates obstructions to navigable airspace (14CFR77.13(a)). Regulations state that the FAA Administrator must be notified of any structure whose: (1) height exceeds 200 feet above ground level or (2) exceeds an imaginary surface extending 20,000 ft (3.79 miles) from the nearest airport runway at a slope of 100:1 (horizontal: vertical). If the structure is within 10,000 ft (1.89 miles) of an airport whose longest runway does not exceed 3,200 ft, the slope is reduced to 50:1.

8.5.1 Provide copies of all correspondence with the FAA

Badger State filed the Project for review by the FAA on March 15, 2019. Copies of this correspondence with the FAA is provided in Appendix C.

8.5.2 Provide copies of all FAA determinations of hazard/no hazard.

The FAA provided a Determination of No Hazard to Air Navigation for the Project on April 2, 2019 which is included in Appendix C.

8.5.3 Provide a summary of the status of all FAA determinations with details on how any unresolved problems with aircraft safety are being addressed

Badger State used the FAA Notice Criteria Tool to determine filing requirements with the FAA. Results of the tool indicated that the FAA requests filing. Badger State filed the Project for review by the FAA on March 15, 2019. The aeronautical study conducted by the FAA showed that the Project structures do not exceed obstruction standards and would not be a hazard to air navigation. The FAA provided a Determination of No Hazard to Air Navigation for the Project on April 2, 2019 which is included in Appendix C.

8.5.4 Provide a detailed description of any obstruction marking and lighting that will be required by the FAA

Based on the FAA evaluation, marking and lighting are not necessary for aviation safety. However, if marking or lighting are accomplished on a voluntary basis, they will be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

8.6 WISCONSIN DEPARTMENT OF TRANSPORTATION – BUREAU OF AERONAUTICS – HIGH STRUCTURE PERMITS

8.6.1 Provide a list of all sites requiring DOT high structure permits.

WI Stat § 114.135 grants the power and authority to control the erection of buildings, structures, towers and other objects by the secretary of transportation. Control is limited to those objects that would either extend to a height of more than 500 feet above the ground or surface of the water within one mile of the location of the object, or above a height determined by the ratio of one foot vertical to 40 feet horizontal measured from the nearest boundary of the nearest public airport or spaceport within the state; however, this power and authority shall not extend to objects of less than 150 feet in height above the ground or water level at the location of the object or to objects located within areas zoned under WI Stat § 114.136 or to objects located within areas zoned under WI Stat § 62.23 (7) where the zoning ordinance enacted under said subsection controls the height of structures.

No structures will be constructed above 500 feet in height or within one mile of a public airport or spaceport for the Project. Therefore, no high structure permits from the WDOT Bureau of Aeronautics will be required.

8.6.2 List the permit status and conditions for each site requiring high structure permits.

No structures developed for the Project will require permits from the WDOT Bureau of Aeronautics.

9.0 ELECTRIC AND MAGNETIC FIELDS (EMF)

9.1 ESTIMATE OF MAGNETIC PROFILE CREATED BY COLLECTOR CIRCUITS

An analysis of the estimated magnetic profile of the proposed collector system for the Project was conducted by Stantec using the Bonneville Power Administration (BPA) Corona and Field Effects software. Results of the analysis are summarized here; a copy of the complete EMF Study is provided in Appendix P.

9.1.1 Show a separate profile for the typical buried collector circuits. If some trenches would support more than one buried circuit, provide a separate estimate for each bundled configuration.

The maximum magnetic field strength estimated near or at the centerline of the trench was calculated and is summarized in the Table 9.1.1-1. In each scenario of underground cables at 25-feet from the centerline, the magnetic field was below 5 milli-Gauss (mG). Electric field intensity was not calculated for the underground scenarios in the analysis because it is canceled out due to the shielding by the metallic screen on the underground cables. Appendices A.1 to A.5 in the EMF Study in Appendix P of this application provides detailed results for the 5-underground cable scenarios.

TABLE 9.1-1 UNDERGROUND CABLE SCENARIOS

UNDERGROUND (UG) CABLES	MAXIMUM MAGNETIC FIELD (at/near Centerline) (mGauss)
Scenario 1: 1 UG cable	19.09
Scenario 2: 2 parallel UG cables	31.17
Scenario 3: 3 parallel UG cables	38.03
Scenario 4: 4 parallel UG cables	42.14
Scenario 5: 5 parallel UG cables	43.35

9.1.2 Show a separate profile for any overhead collector circuits.

The maximum electric field strength and magnetic field strength estimated near or at the centerline of the overhead lines was calculated and is summarized in the Table 9.1.2-1. In each scenario for the overhead lines at 25-feet from the centerline, the magnetic field was below 46 milli-Gauss (mG) and the electric field was below 0.2 kV/m. Refer to Appendices A.6 to A.10 in the EMF Study in Appendix P of this application for detailed results of the overhead line scenarios.

TABLE 9.1.2-1 OVERHEAD CABLE SCENARIOS

OVERHEAD (OH) CIRCUTS	MAXIMUM ELECTRIC FIELD (at/near Centerline) (kV/m)	MAXIMUM MAGNETIC FIELD (at/near Centerline) (mGauss)
Scenario 6: 1 Circuit OH line	0.08395	14.39
Scenario 7(a): 2 Circuits OH lines (Config. a)	0.17121	17.59
Scenario 7(b): 2 Circuits OH lines (Config. b)	0.50606	83.62
Scenario 8(a): 3 Circuits OH lines (Config. a)	0.16020	31.98
Scenario 8(b): 3 Circuits OH lines (Config. b)	0.55675	86.47

9.1.3 Assume all panels are working and project is producing at maximum capacity.

The EMF Study and corresponding tables above included the assumption that all primary panels are working and producing at maximum capacity.

9.1.4 Show EMF profile at 0 feet, 25 feet, 50 feet, and 100 feet from the centerline of each circuit type modeled.

EMF profiles at 5-foot increments up to 200 feet from either side of the centerline are provided for each underground scenario in Appendix A.1 through A.5 of the EMF Study included as Appendix P of this application. Magnetic field profiles at 5-foot increments up to 200 feet from either side of the centerline and electric field profiles at 5-foot increments up to 200 feet from either side of the centerline are provided for each overhead scenario in Appendix A.6 through A.10 of the EMF Study included as Appendix P of this application.

The PSC has concluded that there is no correlation between magnetic fields and negative health effects[8]. For comparison the Table 9.1.4-1 identifies sample ranges of magnetic fields for various appliances and tools.

[8] Public Service Commission of Wisconsin, EMF – Electric and Magnetic Fields, The Electromagnetic Spectrum, https://psc.wi.gov/Documents/Brochures/EMF.pdf >, accessed February 28, 2019.

Table 9.1.4-1 Common Sources of Magnetic Fields (mG)[9]

Sources	Distance From Source	
	6 inches (mGauss)	24 inches (mGauss)
Microwave Ovens	100 - 300	1 - 30
Dishwashers	10 - 100	2 - 7
Refrigerators	Ambient - 40	Ambient - 10
Fluorescent Lights	20 - 100	Ambient - 8
Copy Machines	4 - 200	1 - 13
Drills	100 - 200	3 - 6
Power Saws	50 – 1,000	1 - 40

[9] National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health, EMF: Electric and Magnetic Fields Associated with the Use of Electric Power, June 2002, pp.33-35, <https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf>, accessed on February 28, 2019.

10.0 LINE-OF-SIGHT AND BROADCAST COMMUNICATIONS

Solar facilities are not likely to cause disruptions to line-of-sight and broadcast communications. The height of the Project facilities should not obstruct microwave beam paths, degrade broadcast communications, or interfere with cell phone communications or radio broadcasts. Although unlikely, if any resident or business were able to show impacts to line-of-sight or broadcast communications due to the Project, such impacts will be mitigated to the extent practicable.

10.1 MICROWAVE COMMUNICATIONS

Telecommunications is the exchange of information over significant distances by electronic means and refers to all types of voice, data, and video transmission. This is a broad term that includes a wide range of information transmitting technologies such as telephones (wired and wireless), microwave communications, fiber optics, satellites, radio and television broadcasting, the internet, and telegraphs.

Construction of the Project could impact existing telecommunications infrastructure buried underground during construction activities, such as site grading, excavation, and trenching. Wisconsin's One Call center will be contacted prior to construction to locate and avoid impacts to all underground communication system facilities. Once operational, the Project would not impact these resources.

First responder, industrial and business land mobile sites, area-wide public safety, commercial Emergency 911 communications, and land mobile systems are typically unaffected by operation of solar facilities. These networks operate in a non-line-of-site environment. Many land mobile systems are designed with multiple base transmitter stations covering a large geographic area with overlap between adjacent transmitter sites so that the end user is likely to receive signals from multiple transmitter locations.

The maximum height of the solar panels when positioned at their highest apex will be 10 to 12 feet (3.0 to 3.7 meters). The perimeter security fence will be 8 feet (2.4 meters) high. The facilities developed for the project are consistent with the height of existing development in the Project area and are not anticipated to impact any telecommunications services.

10.2 RADIO AND TELEVISION INTERFERENCE

The exclusion distance for AM broadcast stations varies as a function of the antenna type and broadcast frequency. For directional antennas, the exclusion distance is calculated by taking the lesser of 10 wavelengths or 1.9 miles (3 km). For non-directional antennas, the exclusion distance is simply equal to 1 wavelength. Potential problems with AM broadcast coverage are only anticipated when AM broadcast stations are located within their respective exclusion distance limit from an object that may potentially cause interference. Most facilities do not typically cause interference with FM broadcast stations.

Multipath interference to a television receiver occurs when television signals are scattered by reflecting off an object such as rotating wind turbine blades. Modern digital television (TV) receivers have undergone significant improvements to mitigate the effects of signal scattering. When used in combination with a directional antenna, it becomes even less likely that such signal scattering will cause interference to digital TV reception.

The Federal Communications Commission (FCC) website was reviewed for AM and FM radio stations, and TV stations within 3 miles (4.8 km) of the Project boundary. No stations were identified by this search. As there were no AM, FM, or television stations found within 3 miles (4.8 km) of the Project, the Project should not impact the coverage of local AM stations.

The maximum height of the solar panels when positioned at their highest apex will be 10 to 12 feet (3.0 to 3.7 meters). The perimeter security fence will be 8 feet (2.4 meters) high. The facilities developed for the project are consistent with the height of existing development in the Project area and are not anticipated to impact any radio or television services. After commercial operation, any interference reports will be investigated. Any reports determined to be caused by the installation of panels will be mitigated so as to provide the same level of coverage prior to the installation of the Project.

10.3 NEXRAD INTERFERENCE

A Doppler radar is a specialized radar that uses the Doppler effect to produce velocity data about objects at a distance. It does this by bouncing a microwave signal off a desired target and analyzing how the object's motion has altered the frequency of the returned signal. This variation gives direct and highly accurate measurements of the radial component of a target's velocity relative to the radar. Doppler radars are used in applications such as aviation, sounding satellites, and weather. Tall structures such as trees or buildings within the sight line of the sending position may result in radar interference.

The maximum height of the solar panels will be 10 to 12 feet (3.0 to 3.7 meters) and the perimeter security fence will be 8 feet (2.4 meters) high. Because the radar towers are elevated to avoid interference from topography (minimum height of the NEXRAD towers is 32.8 feet (10 meters) in height, it is not anticipated that there would be any impact to radar services due to the development of the Project.

10.4 OTHER COMMUNICATIONS SYSTEMS

The FCC website was also queried for registered antenna structures (towers) within 3 miles (4.8 km) of the Project area. No towers are located within the Project area, two are adjacent to the Project and eight are within 3 miles (4.8 km) of the project area. Based on the search, the two closest towers are located 100 feet (30.5 meters) and 1,200 feet (365 meters) from the closest proposed panel, one tower being 29.3 meters (96 feet) in height and one being 57.6 feet (17.6 meters) in height. At this distance and based on the maximum height of the solar panels at 10 to 12 feet (3.0 to 3.7 meters) and the perimeter security fence at 8 feet (2.4 meters) high, the cellular services on the two towers should not be impacted.

11.0 SOUND

11.1 PROVIDE EXISTING (AMBIENT) SOUND MEASUREMENTS AND PROJECTED SOUND IMPACTS FROM THE PROJECT USING THE PSC'S SOUND MEASUREMENT PROTOCOL.

Badger State conducted a sound analysis for the Project. Sound generated due to operation of the facility will be from the substation transformer and the inverters located throughout the Project area. Results of the analysis show that the Project will comply with the state standard and daytime operation sound impact values for Jefferson County will be met.

Solar energy facilities operate by converting solar radiation into electricity. The Project will only produce electricity between sunrise and sunset. After sunset, the site no longer receives solar radiation and the inverters will not operate and produce sound. The substation transformer will be energized but not in operation. Sunrise and sunset times on the longest day of the year (June 21) will be approximately 5:16 am to 8:38 pm. Therefore, the majority of the operation of the solar facility, and therefore the sound production, will occur during the daytime hours as defined by PSC 128.14.

Approximately 73 inverters or less will be installed throughout the Project area. The inverters will be set back from the Project site boundary by a minimum of 105 feet, most inverters will be far more distant to the site boundary. The nearest residence to an inverter is approximately 400 feet. Per the manufacturer's specifications, the maximum sound level from each inverter is less than 79 dBA at a distance of one meter (three feet).

To assess the sound at receptors within the array, guidance for wind energy systems (PSC 128.14) was adopted (Standard). Under this regulation, nighttime hours are the hours beginning at 10:00 p.m. and ending at 6:00 a.m. daily and daytime hours are the hours beginning at 6:00 a.m. and ending at 10:00 p.m. daily. The sound limits apply at the outside wall of a nonparticipating residence or occupied community building. The energy system must be designed so that the sound attributable to the proposed system does not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours. Sound levels from the proposed Project were calculated to verify that sound attributable to the proposed solar array does not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours, as defined by the PSC Standard.

Pre-construction ambient sound measurements were made at three monitoring sites near the proposed substation location and at three monitoring sites near the proposed solar array inverters. Based upon the L_{50} values, the background sound levels varied from 34 to 58 dBA for the varying sample locations and sample periods. The predominant sound source during the sampling was vehicular traffic. Results of the existing ambient sound measurements are provided in Section 5.0 of the Pre-Construction Sound Report included in Appendix Q.

Sound analyses were completed for both an inverter skid, under the conditions of the invertor skid operating at full load, and the substation transformer based on information provided by the equipment manufacturers. An analysis of the impacts from a single inverter skid and a contour map showing the

overall expected sound levels from the total solar array can be found in Appendix C of the Pre-Construction Sound Report conducted for the Project included in Appendix Q of this application.

The maximum sound level due to the inverter skid that would be expected at the outside wall of the receptor expected to receive the highest sound, a distance of approximately 400 feet, would be approximately 39 dBA. This value is less than the PSC nighttime impact Standard of 45 dBA at the wall of the residence. If the inverters are no closer than 105 feet from the project boundary, the daytime operation sound impact limit for Jefferson County will not be exceeded.

The sound analysis for the substation was conducted to determine the maximum sound level that would be experienced at the nearest sound sensitive area (NSA). The substation transformer will have a sound level of approximately 85 dBA at one meter (three feet). The substation will be set back from the nearest residence by approximately 1680 feet. The maximum sound level that would be experienced at this receptor would be 32 dBA. This value is less than the PSC nighttime impact Standard of 45 dBA at the wall of a nonparticipating residence. Therefore, the impacts of the substation on the nearby residences will comply with the state standard and will not be discernable at the residences surrounding the substation. Likewise, with a minimum setback distance of 250 feet, daytime operation sound impact values for Jefferson County will be met. An analysis of the impacts from the transformer and a contour map showing the overall expected sound levels from the substation can be found in Appendix C of the Pre-Construction Sound Report included in Appendix Q of this application.

The projected sound values due to operation of the facility, including the skid inverters and the substation, are at or very near the existing background ambient sound levels.

To further substantiate the calculations shown above, computer modeling of the solar farm was completed. Sound contours were calculated using the Decibel Module of WindPro Modelling software by EMD International, which utilizes conservative ISO 9613-2 algorithms to estimate sound propagation and atmospheric absorption. The parameters and assumptions made in developing the estimates include the following:

- all inverters and substation were running at all times;
- substation sound power level was conservatively estimated at 93.4 dBA and an inverter sound power level of 79.1 dBA was used;
- ground attenuation scenarios of 0.0 and 0.5 (on a scale of 0.0 representing hard ground to 1.0 representing porous ground) were both modelled (separate figures provided);
- meteorological conditions were conducive to sound propagation (10 degrees Celsius and 70 percent relative humidity);
- receptors were represented as a centerpoint on the residence (a total of 246 receptors were identified in the model);
- topography (elevations) were considered and estimated using USGS National Elevation Data.

From this analysis, the maximum modeled sound impact from the solar array at any residence is 33.4 dBA, which is below the Jefferson County Zoning daytime operation standard and the PSC daytime and nighttime operating standards.

As the design of the facility progresses, Badger State will reevaluate the sound impact assessment and will update the Pre-Construction Sound Report to verify compliance should any of the following occur:

- Equipment sound level specifications for the invertor skid or transformer increase from the levels utilized in this analysis,
- The minimum distance from an inverter skid to a residence decreases to less than 400 feet, or
- The minimum distance from the substation transformer to the nearest NSA decreases to less than 1680 feet.

A post-construction sound analysis and report will be completed following construction of the Project and commencement of operations. The purpose of the analysis will be to verify the findings and conclusions of this report.

11.2 PROVIDE COPIES OF ANY LOCAL SOUND ORDINANCE.

State and local sound regulations were reviewed, and no regulations directly applicable to a solar facility were identified. In the absence of existing pertinent regulations, the Commission's Noise Protocols were used as a guideline for the Project. Chapter 11.14, of Jefferson County's Zoning Ordinance (provided in Appendix E) requires that maximum sound pressure levels shall not exceed the values for octave bands lying within the several frequency limits given in the regulation after the application of appropriate corrections at the property line.

11.3 PROVIDE EQUIPMENT MANUFACTURER'S DESCRIPTION OF SOUND ATTENUATING METHODS AND MATERIALS USED IN THE CONSTRUCTION OF PROPOSED EQUIPMENT.

The Power Electronics HEM medium voltage inverter which is designed for utility scale solar applications will be used for the Project. The specification sheet for this unit is provided in Appendix B. Manufacturers of the relatively small solar inverters and motors used for solar energy facilities do not provide information on sound attenuating methods and materials used in construction of the equipment because these sources do not produce appreciable sound.

As stated in Section 11.1, the projected sound values due to operation of the facility, including the skid inverters and the substation, are at or very near the existing background ambient sound levels. The daytime operation sound impact limit for Jefferson County will not be exceeded.

11.4 DESCRIBE HOW SOUND COMPLAINTS WILL BE HANDLED.

Badger State will work to maintain equipment and conduct repairs in a timely manner to avoid excessive sound. If Badger State receives sound complaints from local residents, Badger State will mitigate if appropriate to resolve the complaint.

11.5 DISCUSS ANY MITIGATION MEASURES THAT WOULD BE USED TO ADDRESS SOUND COMPLAINTS DURING THE OPERATION OF THE PROJECT.

As determined by the Sound Analysis conducted for the Project, sound resulting from the operation of the solar facility is anticipated to have minimal impact on nearby residences. No additional mitigation measures are required above complying with the equipment specifications used for the analysis.

12.0 GLARE

12.1 PROVIDE AN ANALYSIS SHOWING THE POTENTIAL FOR GLARE IN THE AREA OF A TYPICAL SOLAR SITE.

(The analysis should list the basic assumptions used and the methodology/software used for creating the shadow flicker analysis.)

Stantec utilized the web-based ForgeSolar glare hazard analysis program to analyze the potential for glare from the Project. This interactive tool provides a quantified assessment of (1) when and where glare will occur throughout the year for a prescribed solar installation, (2) potential effects on the human eye at locations where glare occurs, (3) a general map showing where glare is coming from within an array, and (4) the annual energy production from the photovoltaic (PV) array so that alternative designs can be compared to maximize energy production while mitigating the impacts of glare.

Based on the designed solar array parameters, glare is not predicted to occur from the Project for planes landing on runways facing the general direction of the Project at the following eight (8) airports located within 10 miles of the Project: Rockdale Airport (Rockdale), Blackhawk Island Airport (Fort Atkinson), Tesmer Airport (Waterloo), Ha-Rail Airport (Lake Mills), Oakbrook Airport (Fort Atkinson), Fort Atkinson Municipal Airport (Fort Atkinson), Christie Aerodrome (Fort Atkinson), and Al's Airway Airport (Watertown). Glare is also not predicted for drivers of vehicles on roads adjacent to the project at either 5-ft (cars and small trucks) or 9-ft (semi-trucks) viewing heights.

The Glare Hazard Analysis Report, including discussion of assumptions made in the analysis, is provided in Appendix O.

12.2 DESCRIBE MITIGATION AVAILABLE TO REDUCE GLARE.

As the PV panels will be mounted to single-axis tracking systems, the surface of the PVs will be in-line with the position of the sun; thereby, reducing the potential for steep, glancing angles (i.e., chance for glare) compared to fixed-axis systems. If glint or glare prove to be problematic for an observer, mitigative measures such as fencing, vegetation, or other objects of obstructive nature to mitigate glint or glare effects may be used.

12.3 INQUIRY OR COMPLAINTS.

In the event of a complaint about glare by a resident within or outside of the Project boundary, ForgeSolar modelling will likely be used to assess the extent and time of day of glare at the point of concern. As described in 11.2 above, there are several options for minimizing the impacts on the resident, including fencing and vegetation.

13.0 LOCAL GOVERNMENT IMPACTS

13.1 LOCAL JOINT DEVELOPMENT AND OTHER AGREEMENTS

13.1.1 Provide a summary of major agreement items agreed upon in any Joint Development Agreements (JDA) or other type of agreement including:

13.1.1.1 All services to be provided by the city, town, and/or county during construction and when the plant is in operation (e.g. water, fire, EMS, police, security measures, and traffic control).

13.1.1.2 Specifically, address community and facility readiness for incidents such as fires and structural failures.

13.1.2 Provide a copy of all agreements with local communities (e.g. JDA).

This section addresses the requirements of Section 13.1 of the Application Filing Requirements, including all subsections, i.e., 13.1.1. and 13.1.2.

Badger State is working to enter into a formal agreement Jefferson County in order to memorialize the commitments the Project will make to the local community. Since the Project falls under the PSC's jurisdiction, Jefferson County and Badger State have agreed in principal to pursue a Joint Development Agreement (JDA) to ensure that the Project is addressing particular local concerns as well. Jefferson County and Badger State anticipate that the JDA will include agreement on the following subjects, some of which may exceed State-mandated requirements:

- Road use and maintenance
- Drainage
- Replacement of lost tax receipts local school district and Technical College
- Decommissioning and posting of adequate collateral
- Height and size limitations
- Fencing
- Construction process
- Setbacks and vegetative cover

The Project does not expect to require unusual local public services. Traffic control on the part of the county will be minimal. Construction material delivery is generally not oversized or overweight, thus few traffic control issues should be encountered. The JDA agreement on construction haul routes may determine the need for traffic control assistance from the Jefferson County Sherriff.

Daily traffic due to the maximum level of construction workforce for the Badger State Project is not anticipated to negatively affect the capacity of any route and level of service to the traveling public. Construction traffic will be temporary with an anticipated duration of 9 months to one year. Traffic due to continued operations and maintenance activities for the Project is anticipated to be negligible.

The construction contractor will arrange for the purchase of local water needed during construction for dust control. Normal local fire and EMS service will be relied upon during construction and during facility operation. Cooperation and training meetings with local emergency providers will be organized and held. A fire safety protocol for the Project area will be made available to local departments.

Photovoltaic generating panels and related facilities do not present unique or unusual fire or other safety hazards. Site facilities do not include difficult elevation or facility access situations. Fire and EMS provider cooperation and periodic meetings will be held to maintain familiarity with site facilities. If Badger State adds a Battery Energy Storage System (BESS), fire and EMS personnel will be trained on any special needs it presents.

13.2 INFRASTRUCTURE AND SERVICE IMPROVEMENTS

No additional infrastructure or facility improvements are expected to be required for the construction and operation of the Project. The impact to budgets of local governments will be positive due to increased revenue from the Shared Revenue payment and ancillary impacts such as increase in local jobs, landowner payments, and increased spending locally during the construction period

13.2.1 Identify any local government infrastructure and facility improvements required (e.g. sewer, water lines, railroad, police, and fire).

Badger State is not aware of any infrastructure or facility improvements needed for the construction or operation of the Project. If it is determined that such improvements are necessary, they will be done at the Project's expense.

It is expected that some turning radiuses will need to be temporarily changed for oversized deliveries. When such changes are necessary, Badger State will follow good construction practices; stripping topsoil and stockpiling for use, laying down of road felt, delivering /grading /compacting stone to accommodate deliveries and ultimately restore such areas to preconstruction conditions. See Section 2.3.5 for additional detail on infrastructure improvements.

Badger State will keep a record of the condition of the roads before, during, and at the conclusion of construction or of any major construction event. This will assist Badger State, Jefferson County and the Towns of Jefferson and Oakland in accurately assessing any possible damage to county and town roads. Any such damage will be repaired by Badger State to at least original condition.

13.2.2 Describe the effects of the proposed Project on city, village, town and/or county budgets for these items.

The impacts to the local government budgets will be positive. As referenced in the joint development agreement section above, Badger State has committed to funding school budget lost as a result of property tax declines.

The Wisconsin Department of Revenue Shared Revenue Utility Aid Program provides for a capacity-based payment to be distributed annually to the communities hosting an electric generating facility. As proposed, the 149MW solar project would be eligible for the standard generator payment, as well as a payment for energy derived from an "alternative energy source."

13.2.3 For each site provide an estimate of any revenue to the local community (i.e. city, village, town, county) resulting from the Project in terms of taxes, shared revenue, or payments in lieu of taxes.

In aggregate, Badger State will provide almost $600,000 in annual payments through the Shared Revenue Utility Aid program. Modern PV solar facilities are expected to have useful lives in excess of 30 years. A conservative estimate of 25 years of shared revenue would result in almost $15 million to the county and townships hosting the Project.

The townships will receive $248,333 annually from the Badger State Solar Project and Jefferson County will receive over $347,667 annually. The split between the Township of Jefferson and Township of Oakland will be determined by operating capacity in each; using percentage of leased land in each township as a proxy until final layouts are complete, they can expect to receive the following approximate amounts:

TABLE 13.2-1 ESTIMATE OF REVENUE

	Total	Townships	Jefferson	Oakland	County
MW based Payment	$298,000	$99,333	$50,084	$49,249	$198,667
Incentive Payment	$298,000	$149,000	$75,126	$73,874	$149,000
Total	$596,000	$248,333	$125,210	$123,123	$347,667

Additional information on the Shared Revenue Utility Aid Program, as well as local revenue and other benefits to the community from the Project are presented in detail in the Economic Impact Report (Appendix R).

13.2.4 Describe any other benefits to the community (e.g. employment, reduced production costs, goodwill gestures).

Benefits to the community and surrounding area include the possible hiring of local Project construction, commissioning, operations and maintenance staff as discussed in Section 3.2. Additional jobs would be created to accommodate services, such as snow plowing, landscape maintenance, and Project access road maintenance. Additional economic benefits include significant financial and financial stability benefits to farmland owners that are participating as land lessors to the Project. Other economic benefits not directly controlled by Badger State include ancillary jobs and local support positions in areas such as food service, housing/lodging, hospitality, fuel, fuel delivery, sanitation, gravel, asphalt, road repair and other resource requirements. Local economic benefits to the community are addressed in detail in the Economic Impact Report in Appendix R.

In addition, the Project has been an active community partner. The Project has funded and sponsored events including the Wisconsin Farm Technology Days.

14.0 LANDOWNERS AFFECTED AND PUBLIC OUTREACH

14.1 PROVIDE A SEPARATE ALPHABETIZED LIST (NAMES AND ADDRESSES) IN MICROSOFT EXCEL FOR EACH OF THE GROUPS DESCRIBED BELOW:

14.1.1 Property owners and residents within the Project boundary and a separate list of property owners and residents from the Project boundary out to a distance of 1.0 mile. It is strongly recommended that applicants consult with PSC staff in order to ensure that the format and coverage are appropriate considering the project type, surrounding land use, etc.

A list of property owners within the Project boundary is provided in Appendix S.

A separate list is provided in Appendix S of property owners and residents within 1.0 miles of the Project boundary.

14.1.2 Public property, such as schools or other government land.

There are no schools or government-owned buildings within the Project boundary or within one mile of the Project boundary.

14.1.3 Clerks of cities, villages, townships, counties, and Regional Planning Commissions (RPC) directly affected.

The communities listed in the table below have lands within the Project boundary or have the rights of extraterritorial jurisdiction within Project boundary.

TABLE 14.1-1 CLERKS OF MUNICIPALITIES DIRECTLY AFFECTED

Municipality	Clerk Name	Phone Number
Town of Jefferson	Tina Barnes	(920) 674-5073
Town of Oakland	Chris Astrella, WCPC	(608) 423-9635
County of Jefferson	Audrey McGraw	(920) 674-7144
City of Jefferson	Mary Kuehl	(920) 674-7700
City of Fort Atkinson	Michelle Ebbert, WCPC	(920) 563-7760

14.1.4 List and describe all attempts made to communicate with and provide information to the public. Describe efforts to date and any planned public information activities. Provide copies of public outreach mailings.

Local Residents – Badger State has been meeting with prospective landowners, their tenants, and nearby residents since early 2017 to determine local interest in the Project and to lease land.

Local Units of Government – The Project has also met with local Town and County elected officials and staff to advise them of project activities, to gauge interest in a solar facility, as well as to understand permitting requirements and potential concerns:

- Jefferson and Oakland township board members;
- Jefferson County representatives (County Administration, County Board members, Land and Water Conservation Committee, Planning and Zoning, Conservationist);
- The Mayor of Jefferson City, City Administrator and the Jefferson City Council;
- The City Administrator and City Engineer of Fort Atkinson.

State Elected Representatives and Regulatory Agencies – The Project has also met with state elected representatives and with staff from the Public Service Commission of Wisconsin, Department of Agriculture Trade and Consumer Protection (DATCP) and Wisconsin Department of Natural Resources (WDNR) to discuss permitting and related topics.

Public – In addition, the Project has engaged in outreach activities to share information and gather feedback from a broader public audience, including:

- One-on-one communication with Project neighbors and community leaders
- Presentations at public meetings of local units of government
- Meetings with representatives of the Jefferson Chamber of Commerce, Jefferson County Agribusiness Club, Jefferson County Farm Bureau, Jefferson Rotary, Jefferson County Economic Development Coalition/Thrive Economic Development, Madison Region Economic Partnership (MadREP), Wisconsin Manufacturers and Commerce, and the Wisconsin State Farm Bureau.
- Established a dedicated Website (www.badgerstatesolar.com) that provides information about the Project along with contact information.
- Maintains a local office in Jefferson, and provides meetings by appointment as well as open office hours
- Actively monitors an informational e-mail address and toll-free phone number.
- Hosted an Open House March 28, 2019, with over 100 attendees. (A copy of the invitation letter introducing the project is included as Appendix T. The mailing list used for the event is included as Appendix T.) Over 400 invitations were sent, and the list included landowners within a mile of the facility based on a list compiled by the state in 2018.
- The project has worked with local media to facilitate coverage of plans for the project, resulting in significant coverage in the local area, including front-page print articles in the Jefferson County Daily Union and in the Watertown Daily Times and a 20-minute on-air discussion on the WFAW

Morning Magazine radio show. See Section 14.3 for additional information about and reproductions of media coverage.

A representative list of meetings and events is included as Appendix T.

14.2 DESCRIBE PLANS AND SCHEDULES FOR MAINTAINING COMMUNICATION WITH THE PUBLIC (E.G. PUBLIC ADVISORY BOARD, OPEN HOUSES, SUGGESTION BOXES, AND NEWSLETTERS).

Throughout the permitting, design and construction of the Project, Badger State will continue to communicate and engage with local residents, including the following:

- The Project will maintain a local office in Jefferson with regular drop-in availability as well as the opportunity to make appointments outside of regular office hours.
- The Project will maintain an up-to-date website,
- The Project will monitor an informational e-mail and a toll-free phone line.
- The Project will participate regularly in meetings of local units of government.
- The Project will share project information with local media.
- The Project will continue one-on-one communication as well as participation in meetings of local business and service organizations (Chamber, Rotary, etc.)
- The Project will periodically communicate by letter/newsletter with neighbors in the project area.
- The Project is a major sponsor of Farm Technology Days, hosted in Jefferson County in July 2019.

Upon completion of construction, communication will be maintained by the full-time Project staff.

14.3 IDENTIFY ALL LOCAL MEDIA THAT HAVE BEEN INFORMED ABOUT THE PROJECT. THE LIST OF LOCAL MEDIA SHOULD INCLUDE AT LEAST ONE PRINT AND ONE BROADCAST.

Local coverage of the Project has included a feature interview with *WFAW* radio, and coverage in both the *Daily Jefferson County Union* and the *Watertown Daily Times* newspapers. In addition, the Project has been featured in statewide media coverage prompted by the Dairyland Power Cooperative announcement of a power purchase agreement in March of 2019.

Copies of articles and a link to the radio interview are included in Appendix T.

APPENDIX A FIGURES

APPENDIX B ENGINEERED SCHEMATICS

APPENDIX C AGENCY CORRESPONDENCE

APPENDIX D MISO IMPACT STUDY

APPENDIX E LOCAL PLANS

- Jefferson County Comprehensive Plan
- Jefferson County Parks, Recreation and Open Space Plan
- Jefferson County Agricultural Preservation and Land Use Plan
- Jefferson County Floodplain Ordinance
- Jefferson County Zoning Ordinance
- City of Jefferson Comprehensive Plan
- City of Jefferson Comprehensive Park and Outdoor Recreation Plan
- Town of Jefferson Comprehensive Land Use Plan
- Town of Jefferson Ordinance
- Town of Oakland Comprehensive Plan
- Town of Oakland Ordinance No. 36 - Building and Mechanical Code
- Town of Oakland Ordinance No. 58 - Comprehensive Growth Plan of The Town of Oakland, Jefferson County, Wisconsin
- Town of Oakland Ordinance No. 60 Driveway and Highway Access Permit Ordinance Town of Oakland, Jefferson County, Wisconsin

APPENDIX F GIS SHAPEFILES

APPENDIX G VISUAL RESOURCES TECHNICAL REPORT

APPENDIX H PRELIMINARY GEOTECHNICAL REPORT

APPENDIX I WETLAND/WATERBODY DELINEATION REPORT

APPENDIX J WDNR TABLES 1 AND 2

APPENDIX K SEED MIX TABLES

APPENDIX L CULTURAL AND HISTORICAL RESOURCE REPORTS CONFIDENTIAL

APPENDIX M WDNR CERTIFIED ENVIRONMENTAL RESOURCES REVIEW - CONFIDENTIAL

APPENDIX N STORMWATER, EROSION CONTROL AND FRAC-OUT PLANS

APPENDIX O GLARE HAZARD ANALYSIS

APPENDIX P COLLECTOR SYSTEM EMF STUDY

APPENDIX Q PRE-CONSTRUCTION SOUND REPORT

APPENDIX R ECONOMIC IMPACT REPORT

APPENDIX S PROPERTY OWNERS LIST

APPENDIX T MEETINGS, EVENTS AND OPEN HOUSE