Application to the Ohio Power Siting Board for a Certificate of Environmental Compatibility and Public Need for the Nottingham Solar Project

Applicant: Nottingham Solar LLC

Case No: 21-0270-EL-BGN

PUBLIC VERSION

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July 26, 2021

Via Electronic Filing

Ms. Tanowa Troupe
Administration/Docketing
Ohio Power Siting Board
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Nottingham Solar LLC, Case No 21-270-EL-BGN

Dear Ms. Troupe:

Enclosed for filing in the above-referenced case is a copy of the Application of Nottingham Solar LLC for a Certificate of Environmental Compatibility and Public Need to develop, construct, and operate an up to 100 megawatt ("MW") solar-powered electric facility in Athens Township, Harrison County, Ohio.

Name of Applicant: Nottingham Solar LLC
whose authorized representative is:
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Project Director
BQ Energy Development, LLC
400 Market Industrial Park, Suite 32
San Diego, CA 92128
Telephone: 412.680.1550
E-Mail: lori.cuervo@bqenergy.com

Name/Location of Proposed Facility: Nottingham Solar Farm
Athens Township
Harrison County, Ohio

Authorized Representative:

Dylan F. Borchers
Devin D. Parram
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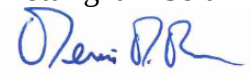
Since the pre-application notification letter was filed, there have been no revisions that appear in the Application.

Notarized Statement: *See* Attached Affidavit of Lori Cuervo, on behalf of Nottingham Solar LLC

Sincerely on behalf of
Nottingham Solar LLC



Devin D. Parram

Enclosure

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of Nottingham Solar LLC for a Certificate of Environmental Compatibility and Public Need for a Solar Facility Located in Harrison County, Ohio.	)))))	Case No. No 21-270-EL-BGN

AFFIDAVIT OF LORI CUERVO
NOTTINGHAM SOLAR LLC

STATE OF PENNSYLVANIA :
: ss.
COUNTY OF WASHINGTON :

I, Lori Cuervo, being duly sworn and cautioned, state that I am over 18 years of age and competent to testify to the matters stated in this affidavit and further state the following based upon my personal knowledge:

1. I am a Director at BQ Energy Development, LLC ("BQ Energy"), which owns 100% of Nottingham Solar LLC ("Nottingham"). I am making this statement in my capacity as a Manager of Nottingham and not in my individual capacity

2. Nottingham's Application to the Ohio Power Siting Board for a Certificate of Environmental Compatibility and Public Need to develop, construct, and operate an up to 100 MW solar-powered electric facility was prepared and reviewed by BQ Energy employees or consultants that are the primary individuals in charge of the development of the Nottingham Application on whom I reasonably rely as subject matter experts.

3. To the best of my knowledge, information, and belief, the information and materials contained in the above-referenced Application are true and accurate.

4. To the best of my knowledge, information, and belief, the above-referenced Application is complete.

Lori Cuervo

NOTTINGHAM SOLAR LLC

Sworn to before and signed in my presence this 23 day of July 2021.

Patricia D. Robbins

Notary Public

[SEAL]

Commonwealth of Pennsylvania - Notary Seal
Patricia D. Robbins, Notary Public
Washington County
My commission expires June 16, 2024
Commission number 1269156
Member, Pennsylvania Association of Notaries

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List of Abbreviations and Acronyms

AC	alternating current
ACF	annual chance flood
AEP	American Electric Power
AML	abandoned mine lands
ANSI	American National Standards Institute
Applicant	Nottingham Solar LLC
BMP	best management practice
BQ Energy	BQ Energy Development, LLC
DC	direct current
Certificate	Certificate of Environmental Compatibility and Public Need
CWA	Clean Water Act
dBA	A-weighted decibels
EMFs	electromagnetic fields
EPC	engineering procurement and construction
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
gen-tie	generation tie-line
GPD	GPD Group
HDD	horizontal directional drilling
IEEE	Institute of Electrical and Engineers
kV	kilovolt
kW	kilowatt
kWac/year	kilowatt alternating current per year
kW_{DC}	kilowatts DC
L_{eq}	equivalent sound level
MET	meteorological
module	solar panel
mph	miles per hour
MVA	mega volt amp

MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEC	National Electrical Code
NESC	National Electrical Safety Code
NPDES	National Pollutant Discharge Elimination System
NPV	net present value
NRHP	National Register of Historic Places
NRTL	nationally recognized testing laboratory
NWP	Nationwide Permits
O&M	operation and maintenance
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEPA	Ohio Environmental Protection Agency
OGS	Ohio Genealogical Society
OH - DOW	Division of Wildlife
OH-DSWC	Ohio stormwater standards
OMEGA	Ohio Mid-Eastern Governments Association
OMS	Ohio Online Mapping System
OPSB	Ohio Power Siting Board
ORAM	Ohio Rapid Assessment Method
PEM	palustrine emergent
PFO	palustrine forested
PILOT	Payment in Lieu of Taxes
PJM	PJM Interconnection, LLC
PPA	power purchase agreement
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub/shrub
Project	Nottingham Solar Project
PV	photovoltaic

RCNM	Roadway Construction Noise Model
ROW	right-of-way
RUMA	Road Use Maintenance Agreement
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
T/E	threatened and endangered
TNW	traditional navigable water
UL	Underwriters Laboratories
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
V	volt
VRI	visual resource inventory
WOTUS	waters of the United States
WQC	Water Quality Certification

4906-4-01 PURPOSE AND SCOPE

(A) GENERAL

This application is intended to satisfy the requirements of the Ohio Administrative Code (OAC) Rule 4906-4 for issuance by the Ohio Power Siting Board (OPSB) for a Certificate of Environmental Compatibility and Public Need (Certificate) for the Nottingham Solar Project (Project) as submitted by Nottingham Solar LLC (Applicant).

(B) WAIVERS

The Applicant is requesting a waiver of OAC Rule 4906-4-08(D).

4906-4-02 PROJECT SUMMARY AND APPLICANT INFORMATION

(A) PROJECT SUMMARY AND APPLICANT INFORMATION

The Applicant, Nottingham Solar LLC, a wholly owned subsidiary of BQ Energy Development LLC (BQ Energy), proposes to construct and operate the Project, a solar-powered electric generation facility in Harrison County, Ohio, with a nameplate capacity of 100-megawatts (MW) alternating current (AC), (hereinafter referred to as MW). The Project will connect to the regional transmission grid via American Electric Power (AEP) owned Nottingham 138 kV Substation. A conservative approach was taken for the studies included in the application that consider the lifespan of the Project to ensure that benefits are not overestimated. An estimated 30-year Project lifespan was utilized for these evaluations (e.g., Economic Impact and Land Use Analysis, payment in lieu of taxes (PILOT)).

(1) General Purpose of the Facility

The purpose of the Project is to provide 100 MW of clean, cost-effective, renewable energy to the PJM Interconnection, LLC (PJM) transmission grid. The Project will generate electricity using virtually no fuels or water and with effectively zero air emissions and waste generation. This

Project is intended to fill the need for a more diverse national energy portfolio that will include a higher percentage of energy generated through use of renewable resources.

(2) General Location, Size, and Operating Characteristics of the Proposed Facility

The Project is in Athens Township, Harrison County, Ohio, located approximately 2.5-miles north of downtown Flushing on reclaimed coal surface mine land adjacent to State Route (SR) 519. The Project will be located entirely on privately owned parcels where the Applicant has secured long-term leases with the landowner. In addition to SR 159 (Stumptown Road), which makes up the majority of the Project Area's northernmost boundary, Jockey Hollow Road makes up the southernmost boundary of the Project Area. The total Project Area encompasses 1,200 acres. The Applicant is proposing to permit the entirety of the Project Area. Based on current Project design, the Facility, which is comprised of all solar components and infrastructure necessary for solar energy generation, will occupy approximately 580 acres of the Project Area. The 580-acre Facility is also referred to as the Project footprint. The Applicant has made considerable effort to depict the Facility layout in its final form to the extent possible at this stage of development. However, the exact placement of the Facility components is subject to change prior to construction. The additional permitted area will allow for any adjustments to the Facility design that may be necessary in the future. The studies included in this application were completed for all 1,200 acres of the Project Area or within the Project footprint, and in some cases additional parcels were surveyed.

The Project will have a generating capacity of 100 MW and will include photovoltaic (PV) solar panels (modules) mounted on a single-axis tracker racking system to maximize solar energy capture and electric generation of the array. Electricity generated by the modules is sent to inverters located throughout the array that would convert the electricity from direct current (DC) to AC, stepping up to 34.5-kilovalt (kV) medium voltage. A series of underground and/or overhead electric collection lines will collect and transfer the electricity from the inverters to a substation on-site, where the voltage will be stepped up to 138kV. Then an approximately 0.80-mile overhead generation tie-line (gen-tie) will deliver electricity to the existing AEP Nottingham 138 kV Substation that connects to the regional transmission grid (the substation and gen-tie will be

included in a separate filing with OPSB). A detailed description of each Project component can be found in OAC Section 4096-4-03(B) in this application.

(3) Suitability of the Site for the Proposed Facility

The Applicant has determined the Project Area to be suitable for utility-scale solar facility development based on the following factors: proximity to available transmission capacity, landowner and community interest, economic analysis, and evaluation of site conditions. A detailed description of the Applicant's siting process and the Project Area's suitability is included in OAC Section 4906-04-04 of this application.

(4) Project Schedule

The Project has been under development since January 2019 and, during that time, multiple transmission, environmental, engineering, and cultural studies have been completed. In addition, interconnection agreements with PJM are expected to be executed in September 2021. In accordance with OAC Rule 4906-3-03A, the Applicant posted a virtual public information meeting about the Project and held one live virtual public meeting on April 27, 2021. The virtual public information presentation and live meeting was made available to the public on April 27, 2021 and the presentation remains available to the public on the Project website. Project construction is expected to begin in the fourth quarter of 2022, with commercial operations beginning in the fourth quarter of 2023. Additional information regarding Project schedule can be found in OAC Section 4906-4-03(C) of this application.

(B) Future Plans for Additional Generation Units or Facilities in the Region

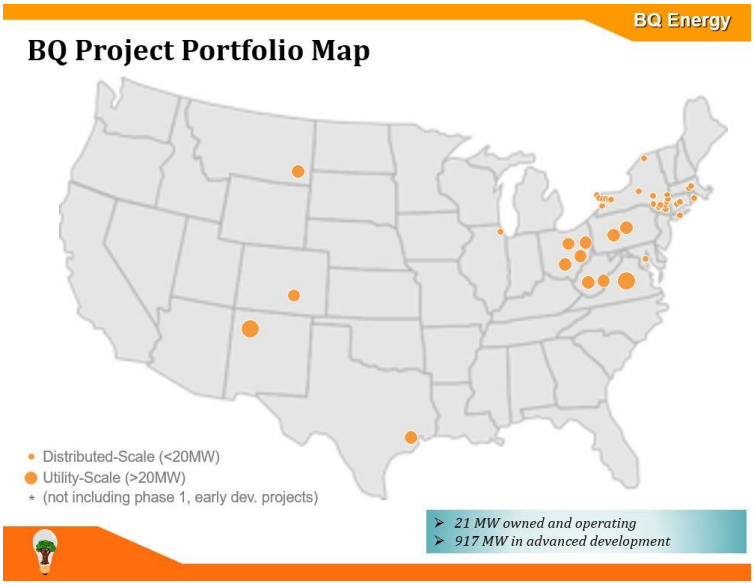
(1) Description of any plans for future additions of electric power generation units

The Applicant is seeking an OPSB Certificate to construct a 100-MW solar energy project located within the Project Area included within this application. Currently, there are no plans to add additional electric power generation units to the Project.

(2) Description of the Applicant's history, affiliate relationships and current operations

The Applicant is a wholly owned subsidiary of BQ Energy and was formed specifically for the purpose of developing the Project. Founded in 2002, specializes in brownfields and landfill solar development and chooses to develop projects exclusively on them. There have been 55 MW of solar on these types of sites developed in the last five years. Out of that 55 MW, 31 MW have been located on landfills and 24 MW have been on brownfields. BQ Energy's project portfolio includes both Distributed Generation and Utility-Scale projects. Over the past five years, all 55 MW have been constructed on either a landfill or brownfield. BQ Energy is arguably the most experienced and successful landfill solar developer in the US. This year to date BQ Energy has added 175 MW of new projects to the development fleet. BQ Energy takes pride in its ability to transform unusable land, such as brownfields and landfills, into operating solar projects that act as a benefit to the community. While the majority of project development tasks are done in-house, collaboration with reputable subcontractors for design and engineering related tasks do take place. BQ Energy funds all aspects of development for most of its project portfolio.

The map figure below highlights the Applicant's project locations across the United States.



4906-4-03 PROJECT DESCRIPTION IN DETAIL AND PROJECT SCHEDULE IN DETAIL

(A) DESCRIPTION OF THE PROJECT AREA'S GEOGRAPHY, TOPOGRAPHY, POPULATION CENTERS, MAJOR INDUSTRIES, AND LANDMARKS

(1) Project Area Map

Figure 3-1 shows the geographic and topographic features of the proposed Project Area, at a scale of 1:24,000, as well as those features within a 2-mile radius of the Project Area. The proposed features specifically include:

(a) The proposed Facility;
(b) Population centers and administrative boundaries;
(c) Transportation routes and gas and electric transmission corridors;
(d) Named rivers, streams, lakes, and reservoirs; and
(e) Major institutions, parks, and recreational areas.

The Project layout depicted in Figure 3-1, and all subsequent figures, represents the current design of the Project. The Applicant has made considerable effort to depict the layout in its final form to the extent possible at this stage of development. However, the exact placement of the Project components is subject to change prior to construction but will remain within the limits of the Project Area. Final engineering will depend on various considerations including the exact make and model of the equipment procured for the Project. Given the time length of the OPSB certification process and market realities for utility-scale solar facilities it is not economically feasible (in the application) to identify the equipment models to be used and give the precise location within the fence of the various components. Because of rapidly advancing technology (both as to cost and performance) and dynamic markets, the final model selections must occur closer to the start of construction. Further, the financing for procurement and construction of a project will be attracted by, and based on, the final model choices and final engineering and design based on those models. Only after the models have been selected and final design and engineering is completed can the precise locations of the key components be identified. Those locations, in turn, will drive those of the ancillary components, including the racking foundations, collection

lines, and roads. Requiring the submission of the final site plan with the application would result in procurement decisions and final design and engineering that are obsolete by the time of financing and construction start. In fact, they could likely be obsolete before a certificate is issued for the Project.

The final layout will remain within the Project Area that has been studied for environmental, sound, engineering, and visual impacts. Any final adjustments to the layout will not cause additional impacts beyond what is discussed in this application. The final layout will be provided to OPSB no later than 30 days prior to the start of construction.

(2) Project Area, in acres, of all Owned and Leased Properties

The Facility will occupy approximately 580 acres within the Project Area, entirely on private land secured under agreements with landowners. Individual Project parcels that comprise the Project Area are depicted in the preliminary site plan included as Exhibit A and in Figure 3-1. While the Project Area encompasses 1,200 acres of land, not all the parcels will have Project infrastructure on the land, as extra land was secured to allow the Project design to be optimized.

Note that even though Figures 3-1 and 3-2 show there may be some overlap of the Facility on land owned by Ohio Department of Natural Resources (ODNR) for the Jockey Hollow Wildlife Area, the Applicant has no intention of placing the Facility on ODNR lands. This appears to be a visual error due to the inaccuracy of parcel data. Property boundary surveys will be conducted to ensure no overlap on ODNR land and that the Project remains on land secured under agreements with landowners.

(B) DESCRIPTION OF THE GENERATION FACILITY

The Project is a 100-MW solar facility capable of providing clean, renewable electricity. Solar photovoltaic modules convert sunlight into DC electricity which is then converted to AC electricity through inverters. Medium voltage transformers step up the AC electricity to 34.5kV so that collection lines can connect inverters to the Facility Substation with minimal energy losses. At the Facility Substation, a single high voltage transformer increases voltage further to 138kV so that it

can connect to the existing AEP Nottingham Utility Substation, and from there the regional transmission grid.

Project components will include PV solar modules mounted on a single-axis tracker racking system supported by steel racking foundations. Other components of the PV system include combiner boxes, inverters, transformers, junction boxes, DC and AC electrical collection systems, communications systems for remote monitoring, a weather station, a Project substation, and a gen-tie line. In addition, the Project will include access roads, security fencing (and may include security cameras, if needed), and stormwater management practices. During construction, the Project will include temporary laydown yards, temporary construction management trailers, and temporary erosion and sediment control practices. Project components are discussed in more detail in OAC Section 4906-4-03(B)(1) in this application and are depicted in the preliminary site plan included as Exhibit A.

Access roads will be private and are designed to follow existing access paths to the maximum extent practical. Access roads will be constructed with gravel. Access roads are designed to be 20ft wide nominally and turning radii have been designed to accommodate a SU-40 vehicle. The Project solar arrays will be secured with perimeter fencing, which will not exceed 8 feet (2.4 meters) in height.

PV solar modules will be mounted on a single-axis tracker racking system and oriented in rows running from north to south and will follow the sun from east to west throughout the day to maximize solar resource efficiency, with a maximum tracking angle of +/-60 degrees. The tracking system will be supported by steel piles or ground screws installed with a pile-driving machine or ground screw. The center height of the tracker structures will be approximately 4 to 6 feet (1.2 to 1.8 meters) above the ground. When the modules are tilted at their maximum angle, the highest point of each module will not exceed 14 feet (4.2 meters) in height above the ground. Solar modules will be connected using DC cables that can either be buried in a trench or attached to the racking system. The DC cables gather at the end of rows and land in combiner boxes which are connected to home run cables that land at the inverter's recombiner boxes at each central inverter equipment pad.

Central inverters and step-up transformers are installed throughout the Project and will convert the DC power from the 1,500-volt (V) DC collection system to 34.5kV AC collection system, which will then be transmitted to the Facility substation. From the Facility substation, electricity will be transmitted to the AEP Nottingham 138 kV Substation via the 138-kV AC generation tie line. The AC collection system will include underground and/or overhead segments. Underground segments of the AC collection system will be buried approximately 36 inches (0.6 meters) below grade or shallower if need through a conduit; and overhead portions will typically not exceed a maximum height of 40 feet (9.1 meters) above grade. The AC collection system will be comprised of medium-voltage cable that will transfer electricity to the Project substation. Collection cables are often congregated into common trenches and run adjacent to one another, though minimum spacing between conductors will ultimately be determined by the electrical engineer based on thermal ampacity analysis, in order to protect conductor insulation integrity.

The Project will include construction of a Facility Substation (details filed separately with OPSB) which will have one 125-mega volt ampere (MVA) transformer and all necessary equipment to step up incoming electricity from 34.5kV to 138kV to interconnect via a separately proposed gen-tie line. The gen-tie line (filed separately with OPSB) will connect to the existing AEP Nottingham Substation, which require building of a new string and installation of two (2) 138kV circuit breakers, installation of associated protection and control equipment, 138kV line risers, SCADA, and 138kV revenue metering. The gen-tie line will be approximately 0.8 miles in length and will be constructed by the Applicant. The proposed gen-tie line location is depicted in Figure 3-2. It is anticipated that gen-tie line poles will not typically exceed 70 feet (21.3 meters) above grade.

(1) Description of the Generation Equipment

Project generation equipment includes PV solar modules that will convert sunlight directly to electricity. Bi-facial modules, which have clear back plates in order to also capture light reflected from the ground, are under consideration for this Project in order to increase energy output and land use efficiency. The remaining Project equipment either transmits, converts, monitors, or transforms electricity generated by the solar modules.

(a) Type, Number of Units, Estimated Net Demonstrated Capacity, Heat Rate, Annual Capacity Factor, and Hours of Annual Generation

A racking system manufacturer has not been selected for the Project; however, it is anticipated that the Facility may include a Gamechange Solar or TerraSmart/RBI single axis tracker racking system, or similar system. General information for these manufacturers is included in Exhibit B. If the Applicant uses a racking technology other than those included in Exhibit B, the Applicant will provide the appropriate manufacturer specification to the OPSB no later than 30 days prior to construction.

Inverters have not been procured for the Project; however, it is anticipated that the Facility will include 32 Power Electronics or similar central inverters. Manufacturer information for Power Electronics inverters are included in Exhibit B. If the Applicant uses an inverter technology other than those included in Exhibit B, the Applicant will provide the appropriate manufacturer specification to the OPSB no later than 30 days prior to construction.

The annual AC net capacity factor for the Facility is expected to be approximately 20.7%, and the annual energy generation is expected to be 181,219 MW hours in year 1. The maximum power output will be 100 MW delivered to PJM. Heat rate is not applicable to solar facilities.

(b) For Wind Farms, Turbine Size

This section is not applicable for solar facilities.

(c) Fuel Quantity and Quality

Fuel quantity and quality are not applicable for solar facilities.

(d) Pollutant Emissions and Estimated Quantities

The Project will generate electricity without producing pollutant emissions. Therefore, this section is not applicable to solar facilities.

(e) Water Volume Requirement, Source, Treatment, and Discharge

The Project will not require any cooling water during operation and, therefore, will not need to treat or discharge water. It is not common to wash PV modules installed in non-desert climates on a regular basis because rainwater rinses PV modules of dust or pollen. In northern climates particularly, snow is known to be one of the best deep cleansers because it scrubs the PV module surface as it melts and slides off. Ohio has many rain and snow events, and with robust vegetative cover, little particulate dust in the air. Nevertheless, some particulates can accumulate over time, particularly on the bottom edges of PV modules if the PV module frame is not flush with the top. It may be cost effective to scrub the bottom edges on multi-year intervals to improve PV module performance. It is not anticipated that detergents would be necessary, and water is likely to be trucked in for wash events. Prior to significant wash events, the Applicant will notify the appropriate local and state authorities and will comply with any relevant regulations.

(2) Construction Method, Site Preparation and Reclamation Method, Materials, Color and Texture of Surfaces, and Dimensions of Facility Components

In general, the Project construction will begin with securing the land leases and easements, installation of temporary erosion and sediment control practices, clearing vegetation (Project anticipates minimal clearing), grading (Project anticipates minimal grading), installation of temporary power, and construction of temporary laydown yards and access roads. Further detail on each component is provided below.

(a) Electric power generation plant or wind-powered electric generation turbines, including towers and foundations

Solar modules are installed on steel posts, and approximately 6 inches by 7 inches (15.2 by 17.8 centimeters). Posts are typically 10 to 15 feet (3.0 to 4.6 meters) long and extended 7 to 11 feet (2.1 to 3.4 meters) to below grade, depending on soil conditions. Posts are primarily installed by pile drivers or ground screw machines. The Project anticipates installing approximately 58,000 posts. Modules are supported on racking systems installed on the posts. Forklifts are used to deliver the steel frame required for the racking structures. Once the posts are driven in the ground, racking mechanisms are installed primarily by hand and modules are then bolted to the frame.

(b) Fuel, waste, water, and other storage facilities

There will be no fuel, waste, water, and other storage facilities on site during operations. Diesel fuel for construction vehicles and equipment will be stored in appropriate containment in the temporary laydown yards located away from any stream or wetland areas.

(c) Fuel, waste, water, and other processing facilities

There will be no fuel, waste, water, or other processing facilities associated with the Project.

(d) Water supply, effluent, and sewage lines

The project will not require permanent water supply or sewage treatment. Operation and Maintenance (O&M) operations will be based out of a separate off-site facility.

(e) Associated electric transmission and distribution lines and gas pipelines.

No new gas pipelines will be needed for the Project. One short overhead electrical 138kV gen-tie line will be constructed to deliver electricity from the Project Substation to the existing AEP Substation, which will connect to the regional transmission grid.

(f) Electric collection lines

There are two types of collection system (also called collection circuits or collection lines) for a solar project: AC collection and DC collection.

DC collection lines (operates at 1,500-V DC) connect the modules to the inverter electrically. The DC source circuits which connect modules in the same row are supported on the back side of the racking structures above ground. At the end of each row, DC output circuits are installed in trenches connecting each end-of-row to DC combiner boxes, and from the DC combiner boxes to the central inverter equipment pads. Approximately 5,321,000 linear feet of DC collection system cables would be installed throughout the Project. DC collection cables are often congregated into common trenches and run adjacent to one another. DC collection lines will require 88,200 linear feet of trenching.

AC collection lines (34.5-kV) connect inverters to the Project substation. There will be approximately four - eight AC collection circuits for this Project, depending on final medium voltage collection line design. Each circuit will connect 4-8 central inverters, each of which will have the capacity to output up to 3.51MVA individually. The AC collection system will be installed via open cut method and buried underground or overhead. Horizontal directional drilling (HDD) may also be used when crossing environmentally sensitive features, such as wetlands or streams. Approximately 119,100 linear feet of AC collection cables would be installed throughout the Project. Collection cables typically require 10-15ft separation between circuits to prevent overheating and degradation of conductor insulation. AC collection lines will require 37,100 linear feet of trenching.

(g) Substations, switching substations, and transformers

Preliminary design includes a single Project Substation with a 125MVA transformer that will transform voltage from the 34.5-kV collection system to the 138-kV gen-tie line, which will connect to the existing AEP Nottingham substation.

There will be two independent 34.5-kV collection system buses with individual 34.5-kV feeder breakers for each collection feeder. All breakers will be supplemented with disconnect switches according to industry practices. A common control enclosure for all four substations will be installed on site that will house the protection, communication, and supervisory control and data acquisition equipment necessary to safely operate the collection substations. The four substation groups are located together and will be approximately three acres total in size. The substation complex will be fenced in and protected according to the National Electric Safety Code (NESC).

The gen-tie line will be approximately 0.80-miles in length and will be constructed by the Applicant to the existing AEP Nottingham Substation. AEP will be responsible for transmission equipment within the Nottingham Substation.

(h) Temporary and permanent meteorological towers

The Project will include at least one meteorological station. The met station will include anemometers approximately 9-15feet (2.7 meters) tall and installed adjacent to the modules. MET

stations also typically include two pyranometers to measure the solar irradiance globally and in the module's orientation angle, and various thermocouples to measure ambient and module temperatures.

(i) Transportation facilities, access roads, and crane paths

Access roads predominantly follow existing access paths, but some new access roads will also be constructed within the Project. These roads will be private, constructed of aggregate gravel, and will not exceed 20 feet (6.1 meters) in width, with the exception of turning radii, which will not exceed 100 feet (30.4 meters) in width. Access roads will be constructed to support the site and weight of vehicle traffic on site.

The highest traffic volume will occur during peak construction periods, when racking systems are being installed and tracking systems and PV solar modules are being assembled concurrently, see Project Schedule (Exhibit C). With the exception of the high voltage transformer delivery to the Project Substation (presented in a separate filing with OPSB) construction traffic is not expected to include oversize or overweight loads.

The Project will not utilize large cranes and, therefore, crane paths are not applicable. A 90-ton hydraulic truck crane will be used to erect the substation and switchyard (presented in a separate filing with OPSB). A crane of this capacity does not exceed the maximum allowable height, width, or weight; thus, an oversized load permit would not be required. The crane will be positioned just off the substation access road which will eliminate the need for a designed crane path.

(j) Construction laydown areas

The Project will include several laydown yards throughout construction. Laydown yards will be installed and removed as needed and will be no more than 3 acres in size, or 7 acres total. The laydown yard will include construction contractor trailers, equipment storage containers, fuel storage for construction equipment, a laydown area for materials and supplies, and an employee parking area. Laydown yard areas will be restored, provided they are not used for other Project components.

(k) Security, operations, and maintenance facilities or buildings

The Project will not require permanent on-site O&M facilities or buildings. O&M operations will be based out of a separate off-site facility. The Facility will be surrounded by approximately 73,100 linear feet of wildlife friendly security fencing, which include 10”-12” gaps at the bottom to facilitate small animal movement and no barbed wire at the top to prevent injury to larger animals. An additional 600 linear feet of high security fencing, which will include barbed wire and no gap at the bottom, will be installed around the Project Substation.

(l) Other pertinent installations

After construction, temporarily disturbed areas will be restored. The Facility will be graded to natural contours where possible and prepared for final seeding. Once construction is complete, the permanent access roads will be dressed as necessary to ensure their long-term function. Erosion control methods during and after construction will depend on the contours of the land, as well as requirements of relevant permits.

(3) New Electric Transmission Line

As previously noted, details of the new transmission line facility associated with the Project will be included in a separate filing with the OPSB.

(4) Project Area Aerial Map

Figure 3-2 depicts the proposed Facility and its nearby roads and property lines at a scale of at least 1:12,000 and includes the following features:

(a) An aerial photograph;
(b) The proposed Facility, including all components listed in paragraph (B)(2) of this rule;
(c) Road names; and
(d) Property lines.

(C) PROJECT SCHEDULE

(1) Project schedule in Gantt Format

The Project schedule is provided in Exhibit C and includes the following milestones:

TASK NAME		START DATE	END DATE
Interconnection			
	Interconnection Application Filed	Fri 3/1/19	Fri 3/1/19
	Feasibility Study Agreement	Fri 3/1/19	Fri 3/29/19
	System Impact Study Agreement	Mon 4/1/19	Mon 4/1/19
	System Impact Study Report	Tue 4/2/19	Wed 2/26/20
	Facilities Study Agreement	Thu 2/27/20	Thu 2/27/20
	Facilities Study Report	Thu 2/27/20	Fri 7/30/21
	Interconnection Service Agreement	Fri 7/30/21	Tue 8/31/21
	File Gen-Tie Accelerated Application	Fri 10/1/21	Fri 12/31/21
	File Substation Application	Fri 10/1/21	Fri 12/31/21
	AEP Interconnection Complete	Wed 5/31/23	Wed 5/31/23
Permitting			
	Retention of Environmental Contractor	Tue 9/15/20	Tue 9/15/20
	Building Permit	Thu 9/1/22	Sat 10/1/22
	OPSB Process	Wed 6/30/21	Mon 6/27/22
	Initial Tree Removal and Trimming	Mon 10/3/22	Fri 10/28/22
	Fence Installation	Mon 10/17/22	Mon 11/14/22
Power Sales			
	Initial Project Modeling	Tue 12/10/19	Mon 2/3/20
	Economic Review	Tue 5/26/20	Mon 6/22/20
	Power Marketing	Tue 6/23/20	Mon 9/14/20
	Power Sales Term Sheet	Sun 8/1/21	Thu 8/26/21
	Power Sales PPA	Fri 8/27/21	Thu 2/10/22
Engineering and Design			
	Conceptual Design	Wed 9/18/19	Tue 10/15/19
	Interconnection Design	Tue 5/26/20	Mon 11/9/20
	OPSB Level Design	Tue 11/10/20	Fri 7/23/21
	Construction Bid Level Design	Tue 11/1/22	Tue 11/1/22
	Issued for Construction Design	Thu 1/19/23	Wed 3/1/23
	As Built Drawings	Fri 12/1/23	Thu 1/25/24
Construction			
	Pre-Construction OPSB Meeting	Thu 9/1/22	Wed 9/28/22
	Construction	Mon 10/3/22	Fri 12/29/23

(a) Acquisition of land and land rights

The Project will be built on private land under lease and easement to the Applicant. OAC Section 4906-4-06(A) in this application details the acquisition of land and land rights for the Project.

Note that even though Figure 3-1 and 3-2 shows there may be some overlap of the Facility on land owned by Ohio Department of Natural Resources (ODNR) for the Jockey Hollow Wildlife Area, the Applicant has no intention of placing the Facility on ODNR lands. This appears to be a visual error due to the inaccuracy of parcel data. Property boundary surveys will be conducted to ensure no overlap on ODNR land and that the Project remains on land secured under agreements with landowners.

(b) Wildlife, environmental, and cultural surveys/studies

Wildlife, environmental, and cultural surveys/studies were completed between 2020 and 2021 and included the following:

- Desktop Phase IA archaeological review (Exhibit D).
- Desktop Phase IA architectural history review (Exhibit E);
- Desktop Landmark Mapping memorandum (Exhibit F);
- Ecological assessment report (Exhibit G), including wetland and waterbody delineation and habitat assessment for listed species

The results of these surveys are summarized in OAC Section 4906-4-08 in this application.

(c) Receipt of grid interconnection studies and other critical path milestones for project construction

The Feasibility Study Agreement was signed March 29, 2019. The Feasibility Study Report was received October 31, 2019. The System Impact Study Report was received February 2020. The Facilities Study Agreement was signed December 2020. A draft Facilities Study Report was received May 13, 2021. PJM has asked the Applicant to provide a list of data requirements so PJM can develop the final report as well as the Interconnection Service Agreement (ISA). The Applicant has supplied the information. Applicant expects the final Facilities Study Agreement as well as the ISA to be received in July 2021. The final System Impact Study Report and the Feasibility Study are included with this Application (Exhibit H).

(d) Preparation of the application

Development of the application commenced in March 2021 and has been ongoing since then.

(e) Submittal of the application for certificate

This application will be submitted on or before July 27, 2021.

(f) Issuance of the certificate

The Applicant anticipates that OPSB will issue a Certificate by the end of July 2022.

(g) Preparation of the final design

The Applicant anticipates that preparation of the final design will commence in the first quarter of 2022 and be completed by August 2022 (e.g., 30 days prior to construction start).

(h) Construction of the facility

Construction of the Project is planned to commence in the fourth quarter of 2022 and be completed in the fourth quarter of 2023.

(i) Placement of the facility in service

The Project is expected to be in service by the end of December 2023.

(2) Proposed construction sequence

An engineering procurement and construction (EPC) contractor will be selected prior to construction. Construction will begin after the necessary permits are received and the interconnection service agreements are executed. Project construction will begin with workforce mobilization and the initial site preparation work including placement of erosion control measures, grading, and any necessary vegetation and tree removal. Localized site grading is expected to be required over smooth areas of rolling terrain within the array to accommodate inverter and step-up transformer equipment pads. Some grading will be required for the Project substation, but access roads will be constructed at grade when possible.

In the initial stages of construction, general site improvements will be made such as access improvements, installation of security fencing, and preparation of laydown areas. Each temporary laydown area will be no more than 3 acres in size or 7 acres total and will be located throughout the Project Area. The Facility components (racking foundations, tracker motors, PV solar modules, collection system, transformers and inverters) will be installed next along with access roads. The Project will be constructed in blocks, and multiple blocks will be constructed simultaneously. Commissioning of electrical equipment will be conducted prior to placement of the Facility in service. As portions of the Project near completion, temporary laydown areas will be vacated and disturbed areas will be reseeded and re-vegetated consistent with the vegetation management plan, Exhibit I. All temporary restroom facilities will be removed.

After construction, temporarily disturbed areas will be restored. The Facility will be graded to natural contours where possible and prepared for final seeding. Once construction is complete, the permanent access roads will be dressed as necessary to ensure their long-term function. Erosion control methods during and after construction will depend on the contours of the land, as well as requirements of relevant permits.

(3) Impact of Critical Delays on the In-Service Date

Due to the complexity of preparing a utility-scale solar facility for permitting, construction, financing, off-takes, etc., impacts of any delays can vary widely. Critical delays may have material impacts and adverse effects on Project financing, including the Applicant's ability to procure PV solar modules and other Facility components. Such delays may push the in-service date back, which would cause significant financial burden to the Applicant, as discussed in OAC Section 4906-4-06(D) of this application.

4906-4-04 PROJECT AREA SELECTION AND SITE DESIGN

(A) SELECTION OF THE PROJECT AREA

(1) Description of the Study Area or Geographic Boundaries of the Area Considered for Development and Rationale for Selection

The Project is in Athens Township, Harrison County, Ohio. The Applicant chose to develop in this area because of the availability and quality of solar resource, proximity to the utility power grid, topography, and limited sensitive ecological and cultural resources. Most important, the Project is located on a reclaimed strip mine and provides the perfect opportunity for beneficial reuse of the land.

(2) Map of the Study Area and General Sites Evaluated

A map of the Project Area (Study Area) is provided in Figure 3-2. The Applicant evaluated land within Harrison County to determine whether or not it was suitable for solar development.

Note that even though Figure 3-1 and 3-2 shows there may be some overlap of the Facility on land owned by Ohio Department of Natural Resources (ODNR) for the Jockey Hollow Wildlife Area, the Applicant has no intention of placing the Facility on ODNR lands. This appears to be a visual error due to the inaccuracy of parcel data. Property boundary surveys will be conducted to ensure no overlap on ODNR land and remain on land secured under agreements with landowners.

(3) Qualitative and Quantitative Siting Criteria Utilized

From a qualitative perspective, open, clear, relatively flat ground, access to transmission lines, and an interested landowner were key to identifying the site. Quantitative siting criteria is based upon estimates of solar resource from data collected on site, required transmission upgrade, interconnection costs, and project size.

(4) Description of the Process and how the Siting Criteria were Utilized

Nottingham's solar siting selection process is comprised of four primary components: transmission proximity, geophysical and environmental review, landowner and community interest, and competition research.

The process begins with identifying large tracts of land that are exclusively brownfields or landfills with access to nearby transmission line facilities. Once a point of interconnection onto the grid is identified, large areas of open ground are analyzed to determine suitability based on land use and environmental concerns. Areas with large concentrations of wetlands, sloped terrain, or undisturbed tree areas are generally avoided, narrowing the number of potential project areas considerably. Research into county parcel data is then completed to identify land ownership. Several potential landowners are contacted to determine interest and to refine the initial site boundary. Research into the community and competitor's actions may then be completed to determine if a site is likely to be successful. A project only moves into advanced development if there is landowner support, lack of nearby competition, and positive results from initial environmental and transmission studies.

(5) Description of the Project Area(s) Selected for Evaluation

The Applicant selected the subject site for further development because of interest and positive feedback from the landowner and local officials, and positive results from initial transmission studies. In addition, due to the nature of the site (i.e., reclaimed strip mine), solar development construction and operations will not have a significant impact on natural resources.

(B) DESIGNING THE FACILITY LAYOUT

(1) Constraint Map

Figure 4-1 presents a map of the Project Area with the setbacks and other constraints.

(2) Criteria Used to Determine the Facility Layout and Site Design

The Project layout has been optimized to utilize available land and still provide environmental and visual setbacks to achieve a minimal impact to natural resources and adjacent residents' viewshed. All of these setbacks have been made proactively by the Applicant to limit impacts to the various resources. The ground coverage ratio was optimized based on a balance of energy efficiency, buildable area, equipment cost, and stormwater management goals. In the current Project design, the solar modules are setback a minimum of 300 feet (91.4 meters) from the adjacent residences, 50 feet (15.2 meters) from non-participating property lines, and 200 feet (61 meters) from public road centerlines.

The Project has been designed such that all wetlands have been avoided and one stream may be crossed. The Applicant is working with the landowner to determine whether the stream can be crossed based on property deed restrictions. If it is determined that the stream can be crossed, the Applicant will coordinate with U.S. Army Corps of Engineers (USACE) and the Ohio Environmental Protection Agency (OEPA) to obtain any necessary permits.

(3) Description of Number and Type of Comments Received

The online and call-in public information meeting was held on April 27, 2021 from 6:00 p.m. to 8:00 p.m. Attendees who joined the public meeting online were able to submit written requests through the chat feature. A full video recording of the information meeting was viewable following the meeting (and remains viewable). Attendees who did not have access to reliable internet were able to use the telephone-based public information option, obtain information, and ask questions regarding the Nottingham Solar Project. The comments received by the third day, via the chat feature, telephone, or handwritten questions, after the public meeting were reviewed and are being considered prior to submitting the application.

Several local residents attended the virtual public information meeting, as did OPSB staff. No concerns were expressed during the Q&A session of the meeting, during which participants had the opportunity to ask questions and provide feedback. Six questions were left at the public

information meeting, all of which, along with responses from the Applicant, are included in Exhibit J.

A summary of some of the questions posed during the public information meeting (see Exhibit J) include:

- What angle will the panels be set at in the north-south direction when tracking east to west, and how is the angle determined?
- Are you still in negotiations with any landowners for access to their property?
- Where will the solar panels and related equipment be manufactured?
- Will you be removing underground cables during the decommissioning?
- When the project is up and running, will there be lighting onsite?
- How many acres are you planning on using?

The Applicant's responses to the inquiries are consistent with the information provided in this application. In addition, the Applicant launched a website (www.nottinghamsolarproject.com) to provide interested individuals a way to seek Project related information and to connect with Project representatives. Between January 1, 2021 and July 15, 2021, 243 visits to the website occurred, with the majority of the visits occurring in April 2021, which is when the Public Information Meeting took place. From a state-by-state breakdown, the most visits to the website have been from the state of Ohio (87 visits, or 36%), including 16 from Brunswick and 12 from Columbus.

Several local residents have been in contact with the Applicant, and these inquiries have resulted in several phone calls and in-person meetings to further engage the community and garner local support for the Project. A summary of public engagement, as well as interaction with local government and community leaders is included in the Public Interaction Plan (Exhibit K).

4906-4-05 ELECTRIC GRID INTERCONNECTION

(A) CONNECTION TO THE REGIONAL ELECTRIC GRID

PJM is the Regional Transmission Operator that coordinates the movement of wholesale electricity throughout 13 states and the District of Columbia in the Midwest and Mid-Atlantic, including Ohio. The Applicant will be connecting the Project to the Nottingham Substation, which is part of the PJM grid. The Nottingham Substation is a 138-kV substation owned by American Electric Power (AEP).

To accommodate the interconnection at the Nottingham 138-kV Substation, the substation will be expanded by extending the 138 kV bus and adding a new circuit breaker string with two (2) new 138 kV circuit breakers. The installation of associated protection and control equipment, line risers, switchers, jumpers, SCADA, and 138 kV revenue metering will be required at the Nottingham 138 kV Station. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements. to require building of a new string and installation of two 138-kV circuit breakers. AEP will extend one span of 138 kV transmission line for the generation lead going to the AE2-290 site. AEP will build and own the first transmission line structure outside of the Nottingham 138 kV Station, to which the AEP and AE2-290 transmission line conductors will attach. It is understood that the Interconnection Customer is responsible for all of the connection costs associated with interconnecting the PJM project AE2-290 to the AEP transmission system. The cost of the customer's generating facility and the costs for the line connecting the generating facility to AEP's transmission system (beyond the first span exiting the Nottingham 138 kV Station) are not included in this report; these are assumed to be the Customer's responsibility. The customer will be responsible for the cost of constructing a fiber-optic connection from their telecom equipment to the Nottingham 138 kV control house.

(B) INFORMATION ON INTERCONNECTION OF THE FACILITY TO THE REGIONAL ELECTRIC POWER GRID

(1) Generation Interconnection Request Information

At the time the Applicant submitted transmission filings with PJM, the final Project size was determined to be 100 MW.

To date, the Feasibility Study, System Impact Study, and Draft Facilities Study have been completed for the AE2-290 queue position. No AEP facility upgrades will be needed. Estimates from the Draft Facilities Study issued in July 2021 show the total cost of the AE2-290 network upgrades to be [redacted]. In addition, it is noted that construction of the Project will result in an overload on the First Energy 138kV Nottingham-Yager transmission line. To mitigate the overload, the Nottingham-Yager transmission line will need to be rebuilt and reconductored, resulting in upgrade costs of [redacted]. The Interconnection Service Agreement draft has been issued and is anticipated to be executed in the third quarter of 2021. The completed PJM studies for queue position AE2-290 are attached in Exhibit H to the application.

The Applicant has a total capability of 100.0 MW with PJM assigned queue number of AE2-290. The Project has completed all system studies and is expected to execute its Interconnection Service Agreement in the third quarter of 2021. AE2-290 was filed by BQ Energy Development Project, LLC (the 100% owner of Applicant); however, the ISA will be issued in the name of the Project Company, Nottingham Solar LLC.

(2) System Studies on Generation Interconnection Request

The Project queue position AE2-290 received its Feasibility Study in [October 2019]; System Impact Study in [February 2020]; and draft Facility Study Report in [July 2021]. A copy of the completed System Impact Study and Feasibility Study is contained in Exhibit H to the application.

4906-4-06 ECONOMIC IMPACT AND PUBLIC INTERACTION

(A) CURRENT AND PROPOSED OWNERSHIP OF THE PROPOSED FACILITY

The Applicant is Nottingham Solar LLC, a subsidiary of BQ Energy Development, LLC, which develops projects and secures PPA that are ultimately transferred to other entities. The Project will be constructed, operated, and maintained by the Applicant.

The Applicant holds all landowner agreements. These agreements will not change the ownership status of the private lands. All landowner agreements are summarized in Table 6-1 below.

Table 6.1 Participating Landowners

Leased Parcel	With Construction	Owner	Approximate Acreage
020000124000	YES	Consol Mining Company	151.1
020000125000	NO	Consol Mining Company	32.7
020000128000	YES	Consol Mining Company	271.7
020000129000	NO	Consol Mining Company	232.2
020000130000	NO	Consol Mining Company	123.9
020000134000	NO	Consol Mining Company	16.2
020000143000	NO	Consol Mining Company	122.9
020000145000	YES	Consol Mining Company	34.3
020000146000	YES	Consol Mining Company	273.7
020000147000	YES	Consol Mining Company	128.9
020000148000	YES	Consol Mining Company	293.5
020000149000	YES	Consol Mining Company	126.2
020000151000	YES	Consol Mining Company	290.4
020000154000	YES	Consol Mining Company	185.0
020000157000	YES	Consol Mining Company	71.8
020000165000	YES	Consol Mining Company	5.5
020000166000	YES	Consol Mining Company	400.0
020000172000	YES	Consol Mining Company	27.7
020000173000	YES	Consol Mining Company	89.3
020000174000	YES	Consol Mining Company	32.2
020000175000	YES	Consol Mining Company	8.4
020000176000	YES	Consol Mining Company	5.7
020000179000	YES	Consol Mining Company	135.2
020000221000	NO	Consol Mining Company	5.8

Notes:
[1]Access agreements allow the Applicant to study and include the land in the Certificate of Environmental Compatibility and Public Need application while the Applicant and landowner negotiate a lease or easement.

(B) CAPITAL AND INTANGIBLE COSTS

(1) Estimates of Capital and Intangible Costs for the Various Alternatives

The Applicant will invest more than [redacted] to develop the Project with capital costs totaling approximately [redacted] and intangible costs including permitting, other development costs, and business overhead totaling approximately [redacted].

Alternative project areas were ruled out, as explained in OAC Section 4906-4-04, prior to conducting detailed cost analyses.

(2) Cost Comparison with Similar Facilities

Based on the current estimated cost of [redacted] (kW_{DC}), which has some variability based on things like discount rates, the Project's costs are consistent with costs for other solar facilities in the Midwest and with others developed by BQ Energy Development, LLC. The *U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark Report* shows the capacity-weighted average installed costs for a 100 MW one-axis tracker utility-scale PV project in 2020 averaged roughly $1,010/kWDC, which is roughly equivalent to $1,224/kWAC, so the anticipated cost for this Project is aligned with the national range (Feldman et al, 2021).

(3) Present value and Annualized Cost for Capital Costs

Capital costs include development costs, engineering, site investigation and preparation, equipment costs, and labor/construction costs. The costs will be incurred over an approximately 12-month period, culminating with the Project's commercial operation start date in 2023. Because of the short construction period, the present value and annualized capital costs will be similar to the costs presented above.

As no other Project location alternatives were considered, no additional present value or annualized cost estimates for capital costs are provided.

(C) Operation and Maintenance Expenses

(1) Estimated Annual Operation and Maintenance Expenses

The estimated (O&M) costs for the Project during the first two years of commercial operation are estimated to be approximately [redacted] annually (excluding costs associated with tax and lease payments, or increases due to inflation).

(2) Operation and Maintenance Cost Comparison

The Applicant expects the annual O&M cost of the Project, including labor wages and benefits, to be approximately [redacted], excluding taxes, land leases, and inflation, or [redacted] alternating current per year (kWac/year). The U.S. Department of Energy, National Renewable Energy Laboratory, issued a report benchmarking the cost of installed solar energy in the first quarter of 2020 across the U.S. and found that annual O&M costs for utility-scale, fixed-tilt PV solar was approximately $16 per kWac/year and $17 per kWac/year when using tracking systems (NREL 2021). These costs exclude inverter replacements. When excluding the employee benefits and taxes, the expected annual O&M cost of the Project is approximately [redacted]. Based on the national average, the Project is slightly above with the national average cost for annual O&M costs.

(3) Present value and Annualized Expenditures for Operating and Maintenance Costs

The present value of the total annual O&M cost, excluding taxes, land leases, and inflation, can be calculated using a 1% escalation for material costs (in constant 2019 dollars) while labor costs are kept in constant 2019 dollars over the 30-year lifespan of the Project. Based on these assumptions, the net present value (NPV) of the O&M costs over the life of the Project is approximately [redacted], which includes [redacted] in land payments.

(D) Estimated Cost for a Delay

Due to the complexity of preparing a modern solar energy facility for permitting, construction, financing, off-takes, etc., impacts of any delays can vary widely. Critical delays may have material, adverse effects on Project financing, including the Applicant's ability to procure PV solar modules and other Project components. Such delays may push the in-service date back. A monthly delay in the in-service date is estimated to have a NPV loss of a minimum of [redacted] per month.

(E) Economic Impact of the Project

The Project will have a positive impact on the local economy primarily through construction spending and jobs, and related tax revenue benefits for the local governments and school districts as described below. WSP conducted a thorough economic impact assessment of the Project and the resulting Socioeconomic Study report is provided in Exhibit L. To quantify the potential impact on the local economy, the IMPLAN input-output model was utilized in the economic assessment. The IMPLAN model is an input-output model that uses county-specific data to predict employment, income, and economic output of solar facilities based on the anticipated capital and operations expenditures of the project. For the Project, three types of expenditures were considered: direct impacts (development and onsite jobs), indirect impacts (module and supply chain), and induced impacts (household spending). In order to determine construction impacts, final demand multipliers were used to estimate the total economic outputs at the county level. The IMPLAN model utilizes Harrison County-specific industry multipliers to determine jobs and economic output from the Project and estimate fiscal impacts at the local, state and federal levels.

(1) Annual Total and Present value of Construction and Operation Payroll

Per the IMPLAN model, the Project will create employment opportunities primarily during the 12-month construction period and it is estimated that the annual total and present value of payroll will total approximately [redacted]. Should the short construction period apply, the present value of payroll costs may differ slightly.

Annual O&M labor is expected to total approximately [redacted] annually over the 30-year life of the Project. As the labor wages and compensation are kept in constant 2019 dollars in the analysis, the present value of the annual O&M payroll is approximately [redacted].

(2) Construction and Operation Employment and Estimates

As a result of the construction and operation of the Project, jobs will be created in both the short- and long-term. According to the IMPLAN model and the Applicant's experience constructing solar energy projects, it is estimated that about 534 job-years will be supported in Harrison County overall during construction of the Project, including through direct, indirect, and induced impacts. Of those jobs, there will be approximately 290 on-site laborers in Harrison County during construction. Over 30 years of operations, the Project is expected to support an additional 764 job-years in Harrison County, including through direct, indirect, and induced impacts.

Estimating the portion of projected employment that would come directly from the region is difficult. While many positions can be filled utilizing local labor, such as equipment operators, truck drivers, laborers, and electricians, there will also be some specialized skilled positions required for construction of the Project. It is anticipated that these specialized positions will need to be filled using non-regional workers, due to the specialized training required for each position.

The local housing market would not be impacted during construction of the Project for two reasons: 1) most of the construction positions will be filled by laborers from the local community, and 2) construction workers not from the local community would only temporarily relocate to the area and it is anticipated that they would return home after construction is complete. Thus, there is no anticipated impact on supply in the local housing market.

The IMPLAN model predicted that new, local long-term jobs from the Project will total approximately 20 individuals in Harrison County through direct, indirect, and induced impacts. This includes a full-time operation and maintenance crew of 3 to 4 people.

(3) Estimated County, Township, and Municipal Tax Revenue

The Applicant anticipates entering into a Payment in Lieu of Taxes (PILOT) agreement with Harrison County, whereby real property and tangible personal property taxes will be abated. The tax abatement structure is currently being discussed with the county and will be finalized after application submission. Payments will not fall below the state minimum annual payment of $7,000/MW or equivalent NPV within the state guidelines per Ohio Revised Code Section 5727.75(G). The economic impact assessment of the Project and resulting report Exhibit L was prepared with these, more conservative, numbers to consider this payment as well as potential upfront payments negotiated with the county to achieve optimal implementation for both the county and the Applicant.

(4) Estimated Economic Impact of the Proposed Facility on Local Commercial and Industrial Activities

The Project will result in a positive overall economic impact on the local economy, including local commercial and industrial activities. There will be direct, indirect, and induced "multiplier effects" from the construction and operation of the Project. These effects can create indirect impacts, such as employment created in producing and transporting solar modules, and induced impacts resulting from the increase in the employees' income and spending (i.e., local restaurants hiring additional staff to accommodate construction laborers spending their wages on meals). The total output (value of production) from the construction of the Project is anticipated to be nearly $46.5 million in Harrison County. Annual operations of the Project are expected to result in almost $3.6 million of output in Harrison County.

Additional value to local economies will result from the increased diversification of the county and state economic bases. Economic diversification ensures greater stability of the economy by minimizing the effects of business cycles associated with specific industry.

(F) PUBLIC RESPONSIBILITY

(1) Public Interaction

Representatives of the Applicant have conducted – and will continue to conduct - meetings with local government representatives and the general public to gather support for the Project and assure

that, to the extent possible, their comments and suggestions have been incorporated into the construction and design of the Project. A detailed summary of public interaction that has occurred and that will occur is documented in the Public Interaction Plan (Exhibit K).

The Project has been under development since 2019.

In preparation for the public meeting prior to the initial filing with OPSB, the Applicant posted a notice in the *Harrison News-Herald* on April 17, 2021 to announce a public information meeting. On April 27, 2021, the Applicant hosted a Public Information Meeting in virtual and teleconference formats. The public information meeting gave local residents an opportunity to learn more about the proposed Project, ask questions, and provide written and spoken comments. A recording of the Public Information Meeting remains available on the Project website launched by the Applicant - www.nottinghamsolarproject.com.

The Project website provides a means to engage the public, provide Project information, answer questions, and solicit feedback from the local community. These types of interactions give the Applicant valuable insights into community interests and allowed Project representatives to respond to questions. An email address for contract regarding the Project, nottinghamsolar@bqenergy.com, is also available.

During the construction and operations periods, individuals will be able to file requests and complaints through multiple methods, including the following:

- By telephone, either using the construction manager's number, which will be provided prior to the start of construction, or the O&M provider's number, which will be on placards placed on the Facility's perimeter fencing, as well as emergency contact numbers and safety warnings. Once established, these numbers will be provided to the Athens Township trustees and/or the Harrison County commissioners.
- By submitting a written complaint to: Nottingham Solar LLC, 400 Market Industrial Park, Suite 32, Wappingers Falls, New York 12590.
- By email, to nottinghamsolar@bqenergy.com.

The Applicant has also developed a Complaint Resolution Plan to address how complaints will be handled and potential mitigation techniques to be implemented for the Project.

No less than seven days prior to commencing construction, the Applicant will distribute this Complaint Resolution Plan to the affected property owner and tenants via first class mail. A copy of the Complaint Resolution Plan is included in Exhibit M.

(2) Insurance

Liability insurance will be maintained at all times during development, construction, and operation of the Project. The Applicant, a wholly owned subsidiary of BQ Energy, has general liability and excess liability policies on the development phase of the Project. The Applicant also requires the construction contractor/EPC company to have builder's risk insurance during construction, as well as decommissioning.

All solar modules will be installed on property under lease or easement or owned by the Applicant. Terms of the leases or easements include requirements for the Applicant to pay annual rent; to pay for all tax-related payments resulting from the solar installation; to minimize impacts on the landowner's current use of the property; and to remove the solar modules upon termination of the land agreement. In addition, the terms of the leases require the Applicant to provide insurance for all Project components and to indemnify the landowner and other third parties from liability claims resulting from the construction and operation of the Project.

The Applicant will carry insurance during development, construction, operation, and decommissioning that will ensure proper indemnification for third parties and for the interests of the Applicant.

A Certificate of Development Liability Insurance is provided as Exhibit N, a portion of which has been filed under seal.

(3) Road and Bridge Impacts

WSP conducted a traffic/route study to identify roadway widths, oversized load limits, utility locations, bridge and culvert locations, and any other concerns as determined by the Harrison County Engineer's Office. The findings of the WSP traffic/route study are summarized below and the complete report is contained in Exhibit O.

There are nine structures, located within the vicinity of the Project, all of which are in good condition and have no posted loading restrictions.

Roadways within the vicinity of the Project are rural routes generally in good condition, except for County Route 29 (Cadiz Flushing Road) and Township Route 254 (Jockey Hollow Road). These roadways are unpaved, gravel routes. These routes are in moderate condition, with potholes and rutting present. These routes are not constructed to carry the anticipated axle loads to be utilized during construction. Potential impacts to CR 29 and TR 254 from construction will be addressed by the Road Use Maintenance Agreement (RUMA) between the Applicant and Harrison County. The RUMA is to be executed upon the selection of the EPC contractor. No other significant concerns to the existing roads were identified by WSP and the Applicant.

A low volume of traffic will occur during Project operations and, therefore, future roadway or traffic impacts are not anticipated.

(4) Transportation Permits

The Ohio Department of Transportation (ODOT) maintains US 22, SR 519, and other State and US routes. The Harrison County Engineer's Office is responsible for maintaining County routes, and the local Township Trustees maintain jurisdictional authority on township highways. The Harrison County Engineer may require a Road Use and Maintenance Agreement (RUMA) for construction activities. In addition, permits from Harrison County and ODOT for the proposed access roads and underground collection line road crossings, will be obtained prior to construction. The following four Access Points will require permits: Access Points 1, 2, and 3 on SR 519 will require a permit from ODOT, and Access Point 4 on CR 254 (Jockey Hollow Road) will require a

permit from Harrison County. Special Hauling permits will be required by ODOT, for vehicles that exceed legal dimensions or weights. Although most construction traffic will not exceed the legal size, the vehicle delivering the transformer may require this type of permit. At locations where collection lines cross public roadways, a permit will be required from ODOT or the Harrison County Engineer. To apply for transportation permits, the Applicant must have a definitive date upon which the associated work will commence as well as the timeline required for completing the work. Both of these can only be determined closer to construction. Any necessary traffic control will be implemented in accordance with ODOT standards and specifications. Road closures or restrictions are not anticipated. However, the Applicant will work with the Harrison County Engineer to obtain written permission if road closures or restrictions become necessary. Routine Project operation should not require acquisition of transportation licenses or permits.

(5) Decommissioning

The Project will have only modest impacts to the land and will be relatively easy to decommission. Decommissioning the Project should not require any soil or groundwater remediation as operation of the Project will not generate hazardous waste or wastewater. The only materials that may be left in place on the Project are roads desired by landowners; buried collection greater than 36 inches (0.6 meters) below grade; and possibly portions of racking foundations that break off more than 36 inches (0.6 meters) below grade. Project restoration efforts will return the land to substantially its original topography. Restoration shall include returning the soil to its pre-development state to allow any prior agricultural use to resume if the landowner so chooses.

WSP prepared the Decommissioning Plan for the Project included in Exhibit P. Decommissioning costs for the Project will be recalculated prior to commencing construction and will consider salvage of the solar components (Net Decommissioning Cost). If the decommissioning cost exceeds the salvage value of the solar components and therefore, the Net Decommissioning Cost is a positive value, then the Applicant will post decommissioning funds in the amount of the Net Decommissioning Cost in the form of a surety bond, letter of credit, guaranty or other financial assurance. The Decommissioning Plan and financial assurance will be reviewed again in year 10 of Project operations and every five years thereafter to assess the value of the financial assurance per the current Net Decommissioning Cost estimate.

4906-4-07 COMPLIANCE WITH AIR, WATER, SOLID WASTE, AND AVIATION REGULATIONS

(A) REGULATION CONTEXT

The Project will be constructed and operated in compliance with all federal, state, and local regulations for air and water pollution, solid and hazardous wastes, and aviation.

(B) AIR QUALITY REGULATIONS

(1) Preconstruction Air Quality and Permits

(a) Ambient Air Quality of the Proposed Project Area

Air quality within a geographic area is classified by the U.S. Environmental Protection Agency (USEPA) based on National Ambient Air Quality Standards (NAAQS). Areas with pollutant levels below the NAAQs are considered to be in attainment, whereas areas with persistent air quality problems are designated as nonattainment areas. Harrison County is in attainment for all criteria pollutants regulated by the USEPA. There are no areas protected by the Regional Haze Program listed under 40 Code of Federal Regulations Part 81 in Ohio (USEPA 2017).

Some monitoring data are available for Harrison County. Ambient air quality for the Project Area has been characterized with data measured at the nearest monitoring stations to the Project Area for each pollutant. The most recent data available for the state of Ohio are from 2019 and are presented, along with the NAAQS standard for each pollutant, in Table 7-1.

Table 7. 1 2019 Ambient Air Quality Monitoring near the Project Area

Pollutant	Closest Monitoring Site ID	City/County	Averaging Period	NAAQS Standard (Primary)	Highest Reading
PM_{10}	39-067-0005	Hopedale / Harrison	24-hour	150 $\mu g/m^3$	38 $\mu g/m^3$
$PM_{2.5}$	39-067-0005	Hopedale / Harrison	1-year	12.0 $\mu g/m^3$	7.62 $\mu g/m^3$ (mean)
			24-hour	35 $\mu g/m^3$	16.0 $\mu g/m^3$
Ozone	39-081-0017	Steubenville / Jefferson	8-hour	0.070 ppm	0.062 ppm
NO_2	39-013-0006	Shadyside / Belmont	1-hour	100 ppb	36.0 ppb
			1-year	53 ppb	7.26 ppb (mean)

Pollutant	Closest Monitoring Site ID	City/County	Averaging Period	NAAQS Standard (Primary)	Highest Reading
SO_2	39-013-0006	Shadyside / Belmont	1-hour	75 ppb	3.0 ppb
			3-hour	none	n/a
CO	39-013-0006	Shadyside / Belmont	8-hour	9 ppm	1.3 ppm
			1-hour	35 ppm	1.9 ppm
Lead	39-029-0019	East Liverpool / Columbiana	Rolling 3-month average	0.15 $\mu g/m^3$	0.01 $\mu g/m^3$

Source: OEPA 2021a.
Key:
$\mu g/m^3$ = micrograms per cubic meter
NAAQS = National Ambient Air Quality Standards
PM_{10} = Particulate Matter ≤10µm
$PM_{2.5}$ = Particulate Matter ≤2.5µm
ppb = Parts per billion
ppm = Parts per million.

(b) Air Pollution Control Equipment for the Proposed Facility

No air pollutants are associated with the operation of the Project. Therefore, no air pollution control equipment is needed.

(c) Applicable Federal and/or Ohio Air Quality Standards and Limitations

There are no federal or state regulations related to New Source Performance Standards, applicable air quality limitations, NAAQS, or Prevention of Significant Deterioration increments that are applicable to the Project as there are no emissions associated with the operation of the Project.

(d) Required Permits to Install and Operate Air Pollution Sources

No air pollutants are associated with the operation of the Project. Therefore, no air permits are required.

(e) Air Monitoring Station Locations and Major Pollution Point Sources

Because there are no emissions associated with the Project, the location of air monitoring location stations and other current or anticipated point source locations are not provided.

(f) Compliance with Permits and Standards

As described above, no air pollutants are associated with the operation of the Project. Therefore, no federal or state regulations apply, and no air permits are required.

(2) Plan for Emissions and Fugitive Dust Control During Construction

The operation of heavy construction equipment and vehicles will produce some particulate emissions from engine exhaust and fugitive dust generation during travel on unpaved roads and construction activities. These operations will be temporary and limited to active areas of construction and, therefore, will not result in significant impacts on air quality.

Best management practices (BMPs) will be specified in the final SWPPP and will be followed during site preparation and construction to control fugitive dust emissions, including using water to wet down open soil surfaces to prevent dust emission. Water will be used only in periods of high heat and when the soil is deemed dry enough so as not to reach saturation during normal travel.

(3) Air Quality for the Operation of the Proposed Facility

(a) Ambient Air Quality Monitoring Plans

No air pollutants are associated with the operation of the Project. Therefore, no air quality monitoring plan is needed.

(b) Map of Estimated Concentrations in Excess of Significant Emission Rates

Because there are no air emissions from operation of the Project, a map of the estimated concentrations in excess of USEPA "Significant Emission Rates" is unnecessary.

(c) Air Pollution Control Equipment Failure

No air pollutants are associated with the operation of the Project. Therefore, no air pollution control equipment is needed and there is no potential for equipment failure.

(C) WATER QUALITY

(1) Preconstruction Water Quality and Permits

(a) List of Water Quality Permits

The following water quality permits will be obtained, if/as necessary based on the final Project layout, by the Applicant prior to Project construction:

- An Ohio National Pollutant Discharge Elimination System (NPDES) construction stormwater general permit, OEPA Permit No. OHC000005.
- A USACE permit under Section 404 of the Clean Water Act (CWA) for disturbances to waters of the United States (WOTUS; if/as necessary for a stream crossing, although it may not be permissible based on property deed restrictions).
- An OEPA Water Quality Certification under Section 401 of the CWA (if/as necessary for disturbance to streams and wetlands, although not required based on current design and construction methodologies).
- An OEPA Isolated Wetland Permit (if/as necessary for wetland crossings, although not required based on current design).

(b) Map of Water Monitoring and Gauging Stations

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No other water discharge will occur from the site. No monitoring and gauging stations are required.

(c) Monitoring and Gauging Station Information

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No other water discharge will occur from the site.

(d) Existing Water Quality of the Receiving Stream

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No other water discharge will occur from the site.

(e) Water Discharge Permit Application Data

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No other water discharge will occur from the site.

(2) Water Quality During Construction

(a) Map of Water Monitoring and Gauging Stations

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No other water discharge will occur from the site.

(b) Estimated Quality and Quantity of Aquatic Discharges

As mentioned above, aquatic discharges are unlikely to occur during construction of the Project. However, if a spill should occur during construction, the Spill Prevention, Control, and Countermeasure (SPCC) Plan will address the proper methods to contain and mitigate the spill and the agencies to notify. The Applicant will follow all measures indicated in the SPCC Plan and monitor for aquatic discharges to ensure that the water resources are not at-risk during construction. A preliminary SPCC Plan is included with this application (Exhibit Q).

Much of the potable water supply within the Project Area is provided by private drinking wells. ODNR data indicate there are no Ohio source water protection areas or residential water wells located within one mile of the Project Area (OEPA 2021b). As such, drinking water sources are located in sufficient enough distance away from the construction site that, in the event of a spill, the risk of impact to the drinking water sources is minimal. Hazardous materials stored on site during construction will be stored in accordance to the SPCC Plan to prevent a release. If a spill were to occur during construction and inadvertently reaches a waterway, it is only expected to cause a minor increase in turbidity over a short timeframe. A minor increase in turbidity for a short duration is unlikely to cause a serious threat to the drinking water quality of the particular water body in which the aquatic discharge occurs.

Shallow groundwater was observed in 1 out of 15 of the geotechnical soil test pits (TP-6) conducted by Golder Associates, the depth to groundwater at this location was estimated to be 8.0 feet below grade surface (2.4 meters) during excavation of this pit (see Exhibit R). This was the only location were groundwater was encountered, it may be indicative of an isolated perched water

formation which is not unexpected at reclaimed mined sites where mine spoil is highly variable and isolated perched zones or "pockets" of ground water can be common. These areas of perched groundwater will be considered during foundation design and addressed in the final design plans. As a result, the Project is not expected to impact private water wells within or outside of the Project Area.

(c) Mitigation Plans

While aquatic discharges during construction of the Project is not expected to be significant, several measures will be implemented to ensure surface water quality protection, including a Stormwater Pollution Prevention Plan (SWPPP) and the previously mentioned SPCC Plan. The SPCC Plan, as required by the USEPA, will address methods to prevent the potential release of hazardous substances during construction of the Project. If any spills do occur during construction, the SPCC Plan will also address the proper methods to address the spill and agencies to notify.

The SWPPP, required by OEPA as part of the NPDES Construction Storm Water General Permit, will require the use of sediment and erosion control measures and BMPs during construction to implement stormwater pollution prevention measures. BMPs that will be used during construction to prevent excess stormwater runoff from the construction areas will be defined in the SWPPP, when developed. Any increase in stormwater discharges resulting directly from the construction of the Project will be documented in the SWPPP and permitted through the NPDES Construction Storm Water General Permit, OEPA Permit Number OHC000005. Furthermore, measures will be taken to maintain the site with BMPs for post-construction runoff control, as required, to ensure that all new facilities consistent with the operation of the Project do not create any additional stormwater runoff than was generated during preconstruction conditions.

Groundwater impacts will be minimized through SWPPP implementation. However, should shallow groundwater be encountered during excavation, it may be pumped out and discharged into a designated area (approved by the landowner) that will either direct the flow toward existing waterbodies or temporarily retain the water until it can infiltrate back into the ground. Specific details relating to the pumping of groundwater from an excavation area will be included in the SWPPP. Temporary sediment traps or the controlled release of water over vegetated areas will be

utilized during construction to intercept and manage sediment-laden runoff from any dewatering activities that are necessary, allowing sediment to settle prior to discharge.

Direct impacts to streams have been avoided in the Project design; however, one stream may need to be crossed. To accommodate a fence or road crossing in the final design, the stream (and any other streams or wetland possibly impacted) crossing will be coordinated with USACE and the OEPA. In addition, the potential exists for erosion and sediment transport to occur. To mitigate any potential impacts that may occur to these aquatic resources, appropriate erosion and sediment control measures (e.g., silt fences or straw bale dikes or other stormwater control measures) will be used to limit the area of impact to surface waters. Further, the construction corridors and any clearing of vegetation in or near these features will be minimized to reduce potential impacts. These specific measures will be outlined in more detail once the SWPPP has been developed.

These mitigation measures will ensure that impacts to groundwater, surface waters, and wetlands are avoided or minimized to the maximum extent practicable during the construction of the Project.

(d) Changes in Flow Patterns and Erosion

Given the BMPs and mitigation measures that will be implemented during construction of the Project, it is not expected that the flow patterns in the Project Area will be significantly changed from preconstruction conditions. Impacts to wetlands and streams have also been avoided.

Steep slopes have been avoided that would exacerbate erosion. The majority of the Project has been sited on reclaimed mine land and, therefore, only minimal clearing and grading will be required. Additionally, the BMPs that will be implemented during construction will control erosion and sediment that may result from site clearing and grading.

(e) Equipment Proposed for Control of Effluents

There will be no effluent associated with construction of the Project. Therefore, no equipment is needed for control of effluent discharge and no impacts on water resources are expected.

(3) Water Quality During Operation of the Facility

(a) Map of Water Monitoring and Gauging Stations

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No water discharge will occur from the site.

(b) Water Pollution Control Equipment and Treatment Processes

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No water discharge will occur from the site.

(c) Schedule for Receipt of NPDES Permit

The Project requires stormwater discharge from the site during and after operations. Post construction stormwater controls and stormwater discharge will be designed in accordance with the NPDES requirements and Harrison County regulations. The Applicant will obtain and comply with the general NPDES requirements.

(d) Flow Diagram for Water and Water-borne Wastes

The Project requires stormwater discharge from the site. The Applicant will obtain and comply with the general NPDES requirements. No process water or wastewater will be discharged from the site.; therefore, a quantitative flow diagram is not provided.

(e)Water Conservation Practices

The Project will not require any cooling water during operation and, therefore, will not need to treat or discharge water. It is not common to wash PV modules installed in non-desert climates on a regular basis because rainwater rinses PV modules of dust or pollen. In northern climates particularly, snow is known to be one of the best deep cleansers because it scrubs the PV module surface as it melts and slides off. Ohio has many rain and snow events, and with robust vegetative cover, little particulate dust in the air. Nevertheless, some particulates can accumulate over time, particularly on the bottom edges of PV modules if the PV module frame is not flush with the top. It may be cost effective to scrub the bottom edges on multi-year intervals to improve PV module performance. It is not anticipated that detergents would be necessary, and water is likely to be

trucked in for wash events. Prior to significant wash events, the Applicant will notify the appropriate local and state authorities and will comply with any relevant regulations.

(D) SOLID WASTE

(1) Preconstruction Solid Waste

(a) Nature and Amount of Debris and Solid Waste

Construction of the Project is not expected to result in the removal of structures, as structures are not present in the Facility site.

Limited amounts of woody vegetation debris may be generated during the preconstruction site clearing and grubbing activities described in 4906-4-03(B)(2). Approximately 15.7 acres of tree clearing and trimming is anticipated to be required.

(b) Plans to Deal with Waste

The solid waste generated from removal of the structures listed above will be hauled from the Project Area by a waste disposal service and properly disposed of at an appropriate landfill.

The woody debris will be chipped and either used or composted within the Project Area. However, if that is not feasible, then a private contractor will be hired to properly dispose of the debris at an authorized solid waste disposal facility or sold.

(2) Solid Waste During Construction

(a) Nature and Amounts of Debris and Solid Waste Generated During Construction

Construction of the Project will generate minimal non-hazardous solid waste. This material will consist primarily of plastic, wood, cardboard, metal packing/packaging materials, construction scrap, and general refuse.

(b) Storage and Disposal of Wastes

The solid waste generated will be collected from construction sites and other work areas and disposed of in dumpsters located at the construction staging areas. On an as-needed basis, a private

contractor will empty the dumpsters and dispose of the refuse at an authorized solid waste disposal facility.

There are laydown yards which will primarily be used for staging the equipment. It has been assumed that five temporary construction trailers and 40 porta-potties will be placed through the laydown yards. However, out of the several areas, there will be one major laydown yard that will have the trailers for offices, restrooms, and parking for site personnel. During construction there will be multiple dumpsters to support these areas.

(3) Solid Waste During Operation

(a) Amount, nature, and composition of Solid Waste Generated During Operation

No solid waste will be generated on site.

(b) Storage, Treatment, Transport, and Disposal of Solid Waste

No storage, treatment, transport, and disposal of solid waste will occur on the site.

(4) Waste Permits

Operation of the Project will not require acquisition of licenses or permits for the generation, storage, treatment, transportation, and/or disposal of waste.

(E) AVIATION

(1) Aviation Facilities

Harrison County Airport is located 3.6 miles southeast from the Project Area. No other airports, helicopter maps, or landing strips are located within five miles of the Project Area.

(2) FAA Filing Status

The FAA coordination letter is contained in Exhibit S. The glint/glare analysis is contained in Exhibit T.

4906-4-08 HEALTH AND SAFETY, LAND USE AND ECOLOGICAL INFORMATION

(A) HEALTH AND SAFETY

Consistent with OAC Rule 4906-4-08(A), the following details the Applicant's commitment to l comply with health and safety regulations.

(1) Safety and Reliability of Equipment

(a) Major Public Safety Equipment

Measures to prevent unauthorized site entry and unsafe practices will be implemented during Project construction and operation. During the construction phase, temporary, highly visible, plastic mesh fencing will be erected around equipment and spare part storage yards, laydown areas, and other potential construction hazards. The temporary fencing will be supplemented by signs cautioning the public of potential dangers, and providing 24-hour emergency numbers, operator contact information, and instructions for emergency personnel.

The Applicant has initiated coordination with local emergency responders to discuss proper rescue techniques and other items specific to on-site equipment safety, and will continue to coordinate throughout construction and operation phases, as documented in the preliminary Emergency and Fire Response Plan (see Exhibit U). Training programs may be recommended to ensure that responders are prepared to address Project-specific emergencies should they arise. On-site construction workers will adhere to industrial safety standards to avoid injury. Regulations set forth by the national Occupational Safety and Health Administration cover safety issues associated with electricity, construction equipment operation, and other hazards that may be encountered at the Project during construction.

(b) Equipment Reliability

The proposed solar PV modules are designed to have a lifespan of 25 to 50 years and will conform to all applicable Underwriters Laboratories (UL), Institute of Electrical and Engineers (IEEE), National Electrical Code (NEC), Ohio Fire Code, and American National Standards Institute (ANSI) listings. A licensed professional engineer will certify the electrical system design. The

Applicant will ensure that inspections of all components are completed regularly to provide safe and reliable operation.

(c) Generation Equipment Manufacturer's Safety Standards

The Paper addresses potential health and safety concerns related to PV development through a thorough review of the available scientific literature. Generation equipment manufacturer's safety standards will be provided after PV solar module technology has been selected for the Project. All Project electrical equipment is expected to be listed by a nationally recognized testing laboratory (NRTL).

(d) Measures to Restrict Public Access

The Project will be enclosed by a 7-foot (2.1-meter) chain link fence or agricultural fence around the perimeter of the Project. Access will be controlled by gates.

(e) Fire Protection, Safety, and Medical Emergency Plan(s)

An Emergency and Fire Response Plan will be prepared for the Project; the preliminary Emergency and Fire Response Plan for the Project is included with this Application (Exhibit U). Construction and maintenance personnel will be trained and will have the equipment to deal with emergency situations that could occur at the Facility. In addition, the Applicant will ensure all local emergency responders will be trained prior to commissioning of the Project on how to respond to any emergencies related to the Project. The Applicant has initiated preliminary discussions with the Harrison County Emergency Management Agency, and plans to host training through the county in order to involve the New Athens Volunteer Fire Department as well as their mutual aid companies, including but not limited to 2nd alarm Cadiz Volunteer Fire Department and 3rd alarm Harrisville Volunteer Fire Department.

(2) Impact of Air Pollution Control Equipment Failure

As described above, no air pollutants will be associated with the operation of the Project. Therefore, no on-site air pollution control equipment will be necessary.

(3) Sound from Construction and Operation of the Facility

(a) Construction Sound Levels at the Nearest Property Boundary

WSP conducted a noise/sound level assessment to establish existing sound levels in the Project Area and evaluate potential sound impacts from the construction of the Project on nearby residences and other sensitive receptors. The Noise Assessment Report developed for the Project is included in Exhibit V and briefly summarized below.

WSP utilized Cadna-A software to predict the sound levels associated with construction of the Project. Construction equipment sound source information was taken from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM). Construction of the Project is expected to last approximately 12 months.

(i) Blasting Activities

Blasting activities will not be necessary for the Project and, therefore, will not result in noise impacts.

(ii) Operation of Earth Moving Equipment

Earthmoving equipment anticipated to be used during construction include a dump truck, bulldozer, and backhoe. Any earth/spoils that are moved will be throughout the Project Area will not be removed off site. In the worst-case noise scenario, the noise analysis resulted in a maximum predicted sound level of 72 dBA at the closest noise sensitive receptor. The sound resulting from these operations will occur infrequently and over a short duration at each location. Such levels would not generally be considered acceptable on a permanent basis, but as a temporary, daytime occurrence, and with the setbacks implemented by the Applicant, operation of earth moving equipment should not pose undue quality of life concerns for residents near the Project Area.

(iii) Driving of Piles, Rock Breaking or Hammering, and Horizontal Directional Drilling

The solar modules are mounted on racks which are supported by either piles or ground screws; for the purpose of noise analysis driven piles have been assumed to be conservative. There are approximately 58,000 piles that will need to be driven to support the racks. The piles will be

embedded at a depth between 6 and 15 feet (1.8 and 4.6 meters). A horizontal drilling mechanism will be used to bore the collection circuits under streams to avoid impacts to those features. In the worst-case noise scenario, the noise analysis resulted in a maximum predicted sound level of 63 dBA at the closest noise sensitive receptor.

(iv) Erection of Structures

The erection of 32 solar inverters will require the use of a medium cranes and flatbed trucks. There will be up to two inverters (weather permitting) installed each day. The PV models will require forklifts and smaller vehicles for the distribution between each ROW. From there, the PV models will be installed by hand. In the worst-case noise scenario, the noise analysis resulted in a maximum predicted sound level of 60 dBA at the closest noise sensitive receptor. The sound resulting from these operations will occur infrequently and over a short duration at each location. Such levels would not generally be considered acceptable on a permanent basis, but as a temporary, daytime occurrence, and with the setbacks implemented by the Applicant, erection of structures should not pose undue quality of life concerns for residents near the Project Area.

(v) Truck Traffic

The use of a dump and flatbed truck will be necessary during construction of the Project to transport materials and equipment throughout the Project Area. Predicted sound levels for this equipment is included in construction activities detailed above. The sound resulting from these operations will occur infrequently and over a short duration at each location. Such levels would not generally be considered acceptable on a permanent basis, but as a temporary, daytime occurrence, and with the setbacks implemented by the Applicant, truck traffic should not pose undue quality of life concerns for residents near the Project Area.

(vi) Installation of Equipment

Installation of the equipment for the Project will primarily be related to the use of medium cranes. Predicted sound levels for crane equipment is included in construction activities detailed above. The sound resulting from these operations will occur infrequently and over a short duration at each location. Such levels would not generally be considered acceptable on a permanent basis, but as a

temporary, daytime occurrence, and with the setbacks implemented by the Applicant, installation of equipment should not pose undue quality of life concerns for residents near the Project Area.

(b) Operational Sound Levels at the Nearest Property Boundary

In order to assess the impact of sound that will result from operation of the Project, WSP conducted field surveys to establish the ambient sound levels in the Project Area and then utilized Cadna-A software to predict the sound levels that will result from operation of the Project at nearby residences.

WSP conducted background sound monitoring at four different sound monitoring locations throughout the Project Area in order to establish the background (equivalent sound level [L_{eq}]) sound levels within the Project Area. Two locations (M1 & M2) were residential properties selected as the closest representative noise sensitive receptors, while an additional two locations (M3 & M4) were selected to represent the existing soundscapes on and around the Facility site. Background sound monitoring in the Project Area indicated that the daytime L_{eq} at M1 is 59 dBA and M2 is 58 dBA. The nighttime L_{eq} at M1 is 55 dBA and M2 is 53 dBA. The overall L_{eq} at M1 is 58 dBA and M2 is 57 dBA. While there are no existing federal, state, or local regulations applicable to the Project, operational sound predicted for the Project was evaluated against the 5 dBA increase over ambient sound level (L_{eq}) used by OPSB to evaluate solar energy facilities. Operational project sounds levels at all modeled locations are below the 5 dBA increase.

(i) Operational Sound from Generation Equipment

WSP modeled a total of 32 inverters and 32 medium transformers, conservatively operating at full load, and a collector substation with one transformer. Predicted operational sound levels range from 6 dBA at the farthest receptor to 39 dBA at the closest receptor.

(ii) Processing Equipment

Processing equipment is not associated with the Project and, therefore, will not result in sound impacts.

(iii) Associated Road Traffic

Vehicle traffic to access the Project will not significantly contribute to route road traffic sound. Road traffic associated with construction of the Project is addressed above in OAC Section 4906-4-08(A)(3) of this application.

(c) Sound-sensitive Areas within One Mile

The sensitive receptors identified in the Project Area or within a 1-mile buffer around the Project Area are depicted in Figure 8-1. There are 20 residences within a 1-mile radius of the Project Area.

The Project does not anticipate major sound impacts at any of these locations. Project worst-case sound levels are below the five dBA increase over L_{eq} limit for solar energy projects applied to the sound evaluation for this Project.

(d) Mitigation of Sound Emissions During Construction and Operation

The Project is not expected to have significant sound impacts at any residences or other sensitive receptors during operation of the Project. Construction noise can be viewed as a temporary nuisance, and noise levels will be lower as construction moves to further points in the Facility. Construction noise is typically minimized through best practices such as ensuring construction equipment and associated mufflers are in good working order, limiting noisy construction activities to daytime hours only, using alternative quieter methods, use of noise barriers around work sites as financially feasible, and establishing a complaint resolution process (see Exhibit M).

The Applicant maximized Project setbacks from property lines to the extent practical to minimize impact to adjacent residents. In addition, the following sound minimization and mitigation procedures will be implemented during construction:

- General construction activity shall be limited to the hours of 7 a.m. to 6 p.m., or until dusk when sunset occurs. If noise-generating construction needs to occur outside of this timeframe, then neighbors adjacent to the sound generating construction will be notified prior to conducting those construction activities.

- During the construction period, the Applicant's construction contractor will establish a telephone number for emergency and complaint notices. During operations, site staff will be qualified to attend to requests and complaints with the necessary corporate support. Surrounding landowners will be provided with contact information for site staff. The Applicant has developed a Complaint Resolution Procedure Plan to address how complaints will be handled and potential mitigation techniques to be implemented for the Project (Exhibit M).

(e) Preconstruction Background Sound Study

WSP conducted a sound level assessment to establish existing sound levels in the Project Area and evaluate potential sound impacts from the construction and operation of the Project on nearby residences and other sensitive receptors. The Project Noise Assessment Report is included in Exhibit V.

(4) Water Impacts

(a) Impacts to Public and Private Water Supplies from Construction and Operation

Given the nature of the Project, the Applicant does not anticipate impact to the water supply. A desktop review of groundwater well information for the Project Area and surrounding vicinity was obtained from OEPA. There are no water wells within the Project Area or a 1-mile buffer.

No Surface Water Protection Areas or Surface Water Emergency Management Zones are located within one-mile of the Project Area, and therefore, no impacts will occur to these areas.

To provide protection for the water resources within the Project Area and the surrounding area, a SWPPP and SPCC plans will be implemented during construction to minimize and prevent the potential for discharges to surface waters. The potential exists for aquatic discharges (e.g., sediment, oil, etc.) to occur during construction. If discharges do occur, they are anticipated to only cause minor increases in sedimentation and turbidity over a short-term to nearby surface waters. A minor increase in turbidity for a short duration is unlikely to cause a serious threat to the drinking water quality of the particular water body in which the aquatic discharge occurs.

(b) Impacts to Public and Private Water Supplies Due to Pollution Control Equipment Failures

As described above, no water pollutants will be associated with the operation of the Project. Therefore, no on-site water pollution control equipment will be necessary and no impact to public and private water supplies will occur.

(c) Aquifers, Water Wells, and Drinking Water Source Protection Areas Directly Affected by the Proposed Facility

No aquifers, water wells, or drinking water source protection areas are located within 1 mile of the Project Area and, therefore, no impacts will occur to these areas.

(d) Compliance with Drinking Water Source Protection Plans

No drinking water source protection areas are present within the Project Area or a 1-mile buffer; therefore, there are no concerns with compliance for these protection areas.

(e) Flood Potential and Mitigation

No designated 100-year (1% annual chance flood, ACF) nor 500-year (0.2% ACF) flood hazard area is present with the Project Area. The nearest portion of the project is approximately 0.5 miles from and at least 100 feet elevated above the nearest existing flood hazard area (FEMA 39067C0305D, 39067C0310D, and 39067C0315D, 2009). Project infrastructure has been sited to avoid flood hazard areas and, therefore, no impacts will occur. Further, a hydrologic analysis will be completed in the final SWPPP to demonstrate compliance with Ohio EPA requirements to design stormwater detention such that stormwater runoff will not exceed pre-development rates. For this reason, it is also not expected that the Facility would contribute to an expansion of the existing flood hazard area, and additional hydraulic analysis is unwarranted for this project.

(5) Geological Features, Topographic Contours, and Wells

Figure 8-2 depicts the proposed Project, geological features of the proposed Project Area, topographic contours, existing gas and oil wells, and injection wells.

(a) Site Geology Suitability

The Applicant retained Golder Associates to conduct a separate preliminary geotechnical investigation for the proposed Project. The findings of the Golder preliminary geotechnical engineering study is contained in Exhibit R and briefly summarized below. A final geotechnical engineering study will be performed prior to Project construction.

The geotechnical investigation consisted of 15 geotechnical test pits to evaluate the site is suitable for cost-effective development of the proposed solar array systems proposed. High-level preliminary geotechnical considerations were evaluated based on the desktop review and detailed observations conducted during the test pit exploration program.

In general, the desktop review coupled with the test pit exploration program indicated the site has an extensive mining history and the vast majority of the site is underlain by mine spoil of various thicknesses. Golder's assessment did not identify or encounter conditions that would prohibit development of this site for the proposed solar facility. Additional detailed studies are recommended, and geotechnical general industry practices will need to be followed to support the more detailed stages of design.

Redevelopment of previously mined lands with thick layers of mine spoil presents technical challenges due to the heterogeneous nature of the mine spoil material and the variation of spoil thickness across the site. However, successful redevelopment of formerly mined land for solar facilities is feasible and common in this area of Ohio assuming proper site-specific geotechnical evaluations, designs, and controls are completed.

(b) Site Soil Suitability

According to the U.S. Department of Agriculture (USDA) soil survey, the Project Area topsoil primarily consists of reclaimed silty clay loam. Mine spoil encountered during the test pit exploration program is generally described as soft and highly heterogeneous in its composition, which consisted of a mixture of soil and rock materials.

Mine spoil of various thicknesses is present across the Site, and more detailed location specific geotechnical analysis will be completed for any structures that bear within the mine spoil. Due to the soft and heterogeneous make up of mine spoil, it can be highly susceptible to differential settlement if proper geotechnical evaluations and design are not implemented.

Geotechnical foundation analysis (i.e. bearing capacity, settlement, etc.) were not performed as part of the preliminary geotechnical phase of the project. More detailed analysis will be necessary to support advanced stages of design and planning.

As previously noted, the results of Golder's preliminary geotechnical engineering study did not find any soil conditions that would preclude the development of the Site for the proposed solar development. The soils are suitable for a wide range of foundation systems. However, more advanced geotechnical evaluations are warranted to support the Project final design.

(c) Test Pit Excavations

As indicated above, 15 test pits were conducted by Golder around the Project Area. Test boring logs are provided in Appendix A of Exhibit R.

(6) Wind Velocity

Climate data from the Ohio Agricultural Research and Development Center were reviewed to develop an increased understanding of wind velocities in the vicinity of the Project. The Eastern Station in Noble County, Ohio, is the closest weather station to the proposed Project and was utilized to provide an overview of local wind velocities (The Ohio State University 2021). Table 8-1 summarizes average wind speed data recorded at the Eastern Station in 2020.

The data contained in Table 8-1 show that the large majority of the time (91%) average wind speeds are 5 miles per hour (mph) or below. The highest daily average wind speed recorded at Eastern Station during 2020 was 9.0 mph. As such, no plans to mitigate for likely adverse consequences to the Project are necessary. The Facility will be constructed in accordance with all provisions of the Ohio Building and Construction Code. Structural design will be based on risk category 1, 105mph Vult, exposure category C, or as determined by the final structural engineer.

Table 8. 1 Average Wind Speeds for Eastern Station, Noble County, OH (Calendar Year 2020)

Average Wind Speed (mph)	Number of Occurrences	Percent Total (%)
0 - 2	166	45
2.1 - 5	167	46
5.1 - 8	25	7
8.1 - 9	8	2
Total	**366***	**100**

Source: The Ohio State University 2021.
*Note: 2020 was a leap year
Key:
mph = miles per hour

(7) Blade Shear

The Project is not a wind facility; therefore, there are no potential impact from blade shear.

(8) Ice Throw

The Project is not a wind facility; therefore, there is no potential impact from ice throw.

(9) Shadow Flicker

The Project is not a wind facility; therefore, there is no potential impact from shadow flicker.

(10) Radio and TV Reception

The maximum height of solar modules will be 15 feet (4.6 meters) and, therefore, interference with radio and TV reception is not anticipated. The Facility will lack tall structures, exposed moving parts, and will only generate very weak electromagnetic fields (EMFs) that dissipate rapidly over short distances. In addition, the Project will only be operational during daylight hours.

The maximum height of the static mast at the substation will be 70 feet (21.6 meters), and will be addressed in a separate filing with the OPSB.

(11) Radar Interference

The maximum height of solar modules will be 15 feet (4.5 meters) and, therefore, interference with military or civilian radar systems is not anticipated as the Project will lack tall structures, exposed moving parts, and will only generate very weak EMFs that dissipate rapidly over short distances. The maximum height of the static mast at the substation will be 70 feet (21.6 meters), and will be addressed in a separate filing with the OPSB.

(12) Navigable Airspace Interference

The maximum height of the solar modules will be 15 feet (4.5 meters) and, therefore, will not interfere with any navigable airspace. The maximum height of the static mast at the substation will be 70 feet (21.6 meters), and will be addressed in a separate filing with the OPSB.

The next nearest airport is Harrison County Airport in Cadiz, Ohio and is 3.26 miles away from a location in the south east portion of the Project Area. Project data has been entered into the FAA Notice Criteria Tool (see Exhibit S). While the Project did not trigger the notice criteria, the substation component has triggered FAA review. Filing with FAA for the substation will occur at least 45 days prior to construction is required.

(13) Communication Interference

The maximum height of solar modules will be 15 feet (4.5 meters) and, therefore, interference with any microwave communication paths or systems is not anticipated as the Project will lack tall structures, exposed moving parts, and will only generate very weak EMFs that dissipate rapidly over short distances. In addition, the Project will only be operational during daylight hours.

(B) ECOLOGICAL RESOURCES

(1) Ecological Resources in the Project Area

(a) Ecological Resources Map

Figure 8-3 is a map at 1:24,000 scale of the Project Area and a 0.5-mile radius from the Project Area and contains the following information:

(i) The proposed Facility and Project Area;
(ii) Undeveloped or abandoned land such as wood lots or vacant fields;
(iii) Wildlife areas, nature preserves, and other conservation areas;
(iv) Surface bodies of water, including wetlands, ditches, streams, lakes, reservoirs, and ponds; and
(v) Highly erodible soils and slopes of 12 percent or greater.

(b) Field Survey Map of Vegetation and Surface Waters

Figure 8-4 provides a map at a scale of 1:12,000 of the area within 100 feet (30.5 meters) of the potential construction impact area of the Facility and all field-delineated features, including vegetation, wetlands, and streams.

WSP USA (hereafter referred to as WSP) conducted wetland delineation and threatened and endangered species T/E habitat field surveys to assess the vegetative communities as well as delineate and characterize surface water and wetland resources in the Project Area in order to inform Project design. WSP conducted field surveys on January 12, January 13, March 16, and May 27, 2021. Surveys were completed on approximately 1,200 acres of land as reflected in the Ecological Assessment report included in Exhibit G.

Habitat within the Study Area is predominately composed of grassland (906.15 acres, 75.8%), with additional areas characterized as scrub/shrub (153.61 acres, 12.8%), successional hardwood woodlands (57.30 acres, 4.8%), and developed, high intensity (26.11 acres, 2.2%) areas in addition to the delineated wetlands and ponds (53.24 acres, 4.5%) within the Project Area. Below, Table 8-2 provides a summary of the acreages of vegetative communities delineated within the Project Area.

Table 8. 2 Habitat Types Identified within the Nottingham Solar Project Area

Habitat Category	Acres	Land Use (%)
Grassland	906.15	75.8
Scrub/Shrub	153.61	12.8
Ponds and Wetlands	53.24	4.5
Successional Hardwood Woodland	57.30	4.8
Developed, High Intensity	26.11	2.2
Total	**1,196**	**100%**

A total of 25 delineated wetlands, 11 streams, and six ponds are present within the approximately 1,200-acre Project Area. An additional 13 wetlands and 21 streams were previously delineated for CONSOL Energy by GPD Group (GPD) within the Project Area. The total wetland area within the Project Area is 36.55 acres. These wetlands range in size from 0.01 to 12.50 acres within the limits of the Project Area. Delineated wetlands included 33 PEM wetlands totaling 34.22 acres, four PSS wetlands totaling 0.71 acres, and one PFO wetland totaling 0.31 acres. Twenty-eight of the 38 delineated wetlands were identified as Category One wetlands. Ten delineated wetlands were identified as Category 2 wetlands. No Category 3 wetland areas were identified. Figure 8-3 depicts the locations of all delineated wetland features within the Project Area.

Nine of the 25 wetlands delineated by WSP appear to be hydrologically connected to surface waters that are tributaries to a traditional navigable water (TNW). These nine wetlands (totaling 3.97 acres) will likely be considered jurisdictional according to the 2020 *Navigable Water Protection Rule.* In addition, all 12 mitigation wetlands documented by GPD are assumed to be under USACE jurisdiction due to their inclusion in an ongoing Section 404 permit wetland mitigation effort.

Nineteen of the 25 wetlands delineated by WSP did not appear to be hydrologically connected to surface waters that are tributaries to a TNW. These wetlands (totaling 7.16 acres) are not likely to be considered jurisdictional according to the 2020 *Navigable Water Protection Rule.* Therefore, these wetlands will likely be considered isolated and subject to the State of Ohio's Isolated Wetland Law. Each delineated wetland is summarized in Table 8-3.

The functions and values of these wetlands were assessed using Ohio Rapid Assessment Method (ORAM) for wetlands. The categorization of the wetlands was conducted in accordance with OAC Rule 3745-1-54, and also summarized in Table 8-3.

Table 8. 3 Delineated Wetlands within the Project Area

Wetland ID	ORAM Score and Category	Wetland Type	Total Acreage
Wetland NS-1a	Category 1 (27)	PFO	0.31
Wetland NS-1b	Category 1 (27)	PEM	0.78
Wetland NS-2	Category 1 (29)	PEM	0.70
Wetland NS-3	Category 1 (20)	PEM	0.01
Wetland NS-4	Category 1 (17)	PEM	0.07
Wetland NS-5	Category 1 (17)	PEM	0.01
Wetland NS-6	Category 1 (28)	PEM	3.36
Wetland NS-7	Category 1 (23)	PSS	0.23
Wetland NS-8	Category 1 (20)	PEM	0.01
Wetland NS-9	Category 1 (18)	PEM	0.54
Wetland NS-10a	Category 1 (21)	PEM	0.10
Wetland NS-10b	Category 1 (21)	PSS	0.24
Wetland NS-11	Category 1 (17)	PEM	0.38
Wetland NS-12	Category 1 (20)	PEM	0.05
Wetland NS-13	Category 1 (20)	PEM	0.09
Wetland NS-14a	Category 1 (18)	PEM	0.43
Wetland NS-14b	Category 1 (18)	PSS	0.03
Wetland NS-15	Category 1 (20)	PEM	0.38
Wetland NS-16	Category 1 (20)	PEM	0.02
Wetland NS-17	Category 1 (20)	PEM	0.78
Wetland NS-18	Category 1 (19)	PEM	0.14
Wetland NS-19	Category 1 (20)	PEM	0.05

Wetland ID	ORAM Score and Category	Wetland Type	Total Acreage
Wetland NS-20	Category 1 (24)	PEM	1.36
Wetland NS-24	Category 1 (34)	PEM	0.26
Wetland NS-25	Category 1 (26)	PEM	0.03
Wetland NS-26	Category 1 (21)	PSS	0.21
Wetland NS-28	Category 1 (29)	PEM	0.47
Wetland NS-27	Category 1 (25)	PEM	0.09
Wetland WL-17[1]	Category 2 (36)	PEM	0.44
Wetland WL-19[1]	Category 1 (24)	PEM	1.81
Wetland WL-35[1]	Category 2 (36)	PEM	3.03
Wetland WL-90[1]	Category 1 (27)	PEM	0.05
Wetland WL-100	Category 2 (37)	PEM	1.91
Wetland WL-103	Category 2 (34)	PEM	0.51
Wetland WL-104	Category 1 (27.5)	PEM	0.13
Wetland WL-105[1]	Category 2 (37)	PEM	12.50
Wetland WL-108[1]	Category 2 (34)	PEM	0.03
Wetland WL-110	Category 2 (35)	PEM	0.97
Wetland WL-113[1]	Category 2 (35)	PEM	0.68
Wetland WL-129[1]	Category 2 (36)	PEM	0.31
Wetland WL-133[1]	Category 1 (24)	PEM	3.05
		Total	**36.55**

Key :

ORAM = Ohio Rapid Assessment Method

PEM = Palustrine emergent

PFO = Palustrine forested

PSS = Palustrine scrub/shrub

Table 8-4 summarizes the 32 delineated streams, totaling 16,277 linear feet, present within the Project Area. These include nine ephemeral streams that will likely be regulated by the OEPA,

two intermittent stream that will likely be considered jurisdictional by the USACE, and 21 streams for which flow regime was not indicated but which are expected to fall under USACE jurisdiction. All eleven WSP-delineated streams were evaluated using the HHEI methodology and were identified as Modified, Small Drainage, Warmwater Streams. All streams within the Project Area lie within watersheds designated as "eligible" for the OEPA Section 401 Water Quality Certification (WQC) for the USACE 2017 Nationwide Permits (NWPs).

Table 8. 4 Delineated Streams in the Project Area

STREAM ID	STREAM CLASS	STREAM NAME	STREAM TYPE	QHEI OR HHEI RATING	TOTAL LENGHT LINEAR FEET
Stream NS-1	Modified, Small Drainage, Warmwater Stream	NA	Ephemeral	HHEI-24	140
Stream NS-2	Modified, Small Drainage, Warmwater Stream	NA	Ephemeral	HHEI-36	597
Stream NS-3	Modified, Small Drainage, Warmwater Stream	NA	Ephemeral	HHEI-19	651
Stream NS-4	Modified, Small Drainage, Warmwater Stream	NA	Ephemeral	HHEI-20	178
Stream NS-5	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Intermittent	HHEI-26	655
Stream NS-6a	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Ephemeral	HHEI-25	904
Stream NS-6b	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Ephemeral	HHEI-25	212
Stream NS-7	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Ephemeral	HHEI-19	27

STREAM ID	STREAM CLASS	STREAM NAME	STREAM TYPE	QHEI OR HHEI RATING	TOTAL LENGHT LINEAR FEET
Stream NS-8	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Ephemeral	HHEI-19	367
Stream NS-9	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Ephemeral	HHEI-19	166
Stream NS-10	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	Intermittent	HHEI-25	140
Stream S1-C[1]	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-41.5	233
Stream S1-D[1]	NI	UNT to Boggs Fork	NI	NI	562
Stream S2-A	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-27.5	620
Stream S2-B	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-28.5	794
Stream S3-A	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-33	373
Stream S3-B	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-34	866
Stream S-6	NI	UNT to Boggs Fork	NI	NI	336
Stream S-7[1]	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-34.5	1,672
Stream S-8[1]	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-35	1,536
Stream S-9A[1]	NI	UNT to Boggs Fork	NI	NI	165
Stream S-9B[1]	NI	UNT to Boggs Fork	NI	NI	862
Stream S-9C[1]	NI	UNT to Boggs Fork	NI	NI	73

STREAM ID	STREAM CLASS	STREAM NAME	STREAM TYPE	QHEI OR HHEI RATING	TOTAL LENGHT LINEAR FEET
Stream S10-A[1]	NI	UNT to Boggs Fork	NI	NI	86
Stream S10-B[1]	NI	UNT to Boggs Fork	NI	NI	312
Stream S10-C[1]	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-41	342
Stream S10-D[1]	NI	UNT to Boggs Fork	NI	NI	463
Stream S11-A[1]	NI	UNT to Boggs Fork	NI	NI	863
Stream S-18[1]	Poor Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-38	524
Stream S24-A[1]	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	NI	HHEI-13	180
Stream S24-B[1]	Fair Warmwater Habitat	UNT to Boggs Fork	NI	QHEI-47.5	773
Stream S26-C[1]	Modified, Small Drainage, Warmwater Stream	UNT to Boggs Fork	NI	HHEI-41	706
				Total	16,277

Key:
HHEI = Headwater Habitat Evaluation Index
NI = Not Indicated
Non-RPW = Non-relatively permanent water
QHEI = Qualitative Habitat Evaluation Index
RPW = Relatively permanent water
UNT = Unnamed Tributary

Six ponds, totaling 19.61 acres, was also delineated within the Project Area. Four of the six ponds lack a direct surface water connection to tributaries to a TNW or other WOTUS. Two ponds are hydrologically connected to other jurisdictional waters are therefore would be considered jurisdictional by the USACE based on the *2020 Navigable Waters Protection Rule.*

(c) Literature Survey of Plant and Animal Life

WSP submitted a coordination request regarding federally listed threatened and endangered species to the USFWS as well as a request for Environmental Review to the Ohio Department of Natural Resources (ODNR) on December 1, 2020. A response was received from the USFWS on December 11, 2020. The ODNR Environmental Review was received on February 8, 2021.

The USFWS indicated that there are no federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of the Project Area.

The Project Area lies within the range of the Indiana bat (*Myotis sodalis*), a federal endangered species, and the northern long-eared bat (*Myotis septentrionalis*), a federal threatened species. Both species utilize potential summer roost habitat characterized by trees >3 inches diameter at breast height (dbh) featuring exfoliating bark, cracks, crevices, and cavities. The USFWS has recommended that clearing of trees be performed between October 1 and March 31.

The USFWS also recommended that areas between solar panels be planted with legumes and wildflowers that would be beneficial to pollinators and other wildlife, rather than non-native grasses. A list of recommended species was included in the USFWS response. Further information can be provided by the Ohio Pollinator Habitat Initiative.

Due to the project type, size, and location, the USFWS indicated that adverse effects to other federally endangered or threatened species are not anticipated. Correspondence from the USFWS is included with the Ecological Assessment Report (Exhibit G).

The ODNR Environmental Review, dated February 8, 2021 included comments from the Ohio Natural Heritage Database Program, Division of Wildlife (OH-DOW), and Division of Water Resources. The ODNR Environmental Review has been provided in Exhibit G. A review of Natural Heritage Database identified no records of state-listed species or rare habitats within a one-mile radius of the Project Area. Jockey Hollow Wildlife Area, managed by the DOW is located within a one-mile radius of the Project Area, and abuts the northwest corner of the Facility Area.

The Project Area lies in the vicinity of records for the northern long-eared bat, a state endangered species, and the little brown bat (*Myotis lucifugus*), a state-endangered species. Summer tree clearing is not recommended, and additional summer surveys would not prove presence/absence in the Project Area.

The Project Area also lies within the range of the Indiana bat (state endangered) and tricolored bat (*Perimyotis subflavus*), a state endangered species. Limited summer clearing may be acceptable after consultation with DOW. DOW has recommended that tree clearing be limited to October 1 through March 31.

DOW has also recommended that a desktop habitat assessment, followed by a field assessment (if needed) be conducted to determine if potential bat hibernaculum may be present within the vicinity of the Project Area. Guidance regarding habitat assessments is provided in the current *Range-Wide Indiana Bat Survey Guidelines*. If a potential hibernaculum is identified, DOW has recommended a 0.25-mile clearing buffer although limited clearing may be acceptable after consultation with ODNR.

The Project Area lies within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered species. Nesting habitat is provided by dry grasslands, hayfields, and pastures. DOW has recommended that construction in these habitat types be avoided during the upland sandpiper nesting period (April 15 to July 31).

The Project Area lies within the range of the northern harrier (*Circus hudsonius*), a state endangered bird. This species utilizes large grasslands as habitat, where they nest on the ground in nests constructed from sticks. DOW has recommended that construction in potential nesting habitat be avoided between May 15 and August 1.

(d) Plant and Animal Field Survey Results

The ODNR and USFWS indicated that the Project Area lies within the range of several state and federally protected bat species which typically utilize forested areas and individual trees featuring exfoliating bark, cracked branches, and cavities as summer roost habitat. Habitat matching this description may be provided by successional hardwood woodland areas identified the Project Area. This habitat type generally occurs along the outer boundaries of the ESA as well as wooded areas bordering Pond NS-1 and Wetland NS-1. Successional hardwood woodlands comprised a total of 57.30 acres within the Project Area and are shown in Figure 8-4. Additional individual potential roost trees may be located within the Project Area but were not searched for or documented during the environmental survey. A desktop review for potential hibernacula has not occurred as part of the environmental surveys of the Project Area.

Potential nesting habitat for both the upland sandpiper and northern harrier may be provided by grassland habitat documented within the Project Area, totaling 906.15 acres (Figure 8-4). Although avian species surveys were not conducted as part of the environmental survey, several northern harriers were identified during the field effort. These observations coupled with the presence of large areas of potential nesting habitat have prompted initial discussions with DOW regarding potential avoidance and mitigation measures for construction in grassland habitats. Phone conversations with DOW have indicated that removal of potential nesting habitat prior to the nesting period would remove potential for impacts to these species. However, while repeated mowing in the construction area may reduce nesting habitat suitability for northern harrier, it could potentially increase suitability for upland sandpiper nesting habitat.

(2) Potential Impacts to Ecological Resources During Construction

(a) Construction Impacts on Ecological Resources

The development of the Project is not likely to result in significant impacts to ecological resources that may potentially occur within Harrison County and the Project Area as a result of micro-siting efforts to avoid impacts to potentially suitable habitat or construction outside of critical periods.

The Applicant undertook an extensive siting process to minimize and avoid impacts to streams, wetlands, and other protected water resources. Wetland impacts are not proposed within the Project Area. No streams or other protected water resources are anticipated to be impacted by the Project Area.

Potentially suitable habitat may be provided to state- and federally-protected bat species by successional hardwood woodland habitat with the Project Area. Proposed impacts to this habitat type total 15.7 acres. Tree clearing activities will occur outside of the bat summer roosting season, to avoid potential impacts to any potential Indiana and northern long-eared bats. In addition, to further minimize removal of woody vegetation, whenever possible, trees and brush will be manually pruned or trimmed rather than removed.

Potentially suitable habitat for both the upland sandpiper and northern harrier may be provided by grassland habitat within the Project Area. Proposed impacts to this habitat type total 537.90 acres. Construction is also expected to occur in these areas during the April 15 to July 1 upland sandpiper nesting period as well as the May 15 to August 1 northern harrier nesting period in order to keep the project on schedule.

(b) Mitigation Procedures for Construction Impacts

In addition to the extensive micro-siting efforts mentioned above, the Applicant will work to avoid, minimize and, if necessary, mitigate ecological construction impacts. These include specific efforts to minimize disturbance to soils, frac-out contingency plans, delineation and marking of surface waters and wetlands, prepare procedures for inspection and repair of erosion control measures, and methods to protect vegetation in proximity to the Project.

(i) Restoration and Stabilization of Disturbed Soils

After construction, temporarily disturbed areas will be restored. The Facility will be graded to natural contours where possible and prepared for final seeding. Once construction is complete, the permanent access roads will be dressed as necessary to ensure their long-term function. Erosion control methods during and after construction will depend on the contours of the land, as well as requirements of relevant permits.

As construction is anticipated to be completed in Winter 2023-24, temporary stabilization will be installed. Permanent stabilization seeding will occur in Spring 2024. All stabilization and reseeding will comply with the requirements of the General NPDES Permit. Areas disturbed during construction will be reseeded with a low-growth, native grass seed mix under the solar array and a pollinator-friendly seed mix in select open areas outside of the array and within the Project perimeter fence line.

The Project is considered to be permanently stabilized when all soil disturbed activities have been completed and a uniform perennial vegetative cover with a density of 70% has been achieved in all areas of the site not covered by other permanent ground covers. Any seed, straw, and/or matting used within the Project Area will meet Ohio stormwater standards (OH-DSWC 2006).

(ii) Frac Out Contingency Plan

The Project intends to employ HDD techniques to install cables underneath roads and streams. HDD activities are anticipated to occur at least 500 feet (154 meters) from any residence. Additionally, if HDD installation results in impact to a stream, the Applicant will notify the OEPA, Office of Emergency Response via the 24-Hour Emergency Spill Hotline and prepare a monitoring report documenting the leak location, estimated volume and cleanup efforts.

A Preliminary Inadvertent Return (Frac-Out) Plan has been developed for the Project (see Exhibit X).

(iii) Demarcation of Surface Waters and Wetlands

Impacts to surface water and wetlands during construction will be minimized through the implementation of a SWPPP to prevent erosion and sedimentation into nearby waterbodies under OEPA's NPDES General Permit for Construction Activities. Silt fencing will be installed on the upslope side of all wetlands abutting construction activity, in accordance with the SWPPP and preliminary E&SC design drawings. Further, areas disturbed during construction will be restored to preconstruction conditions as soon as possible in order to further minimize the impact of construction.

(iv) Procedures for Inspection and Repair of Erosion Control Measures

A SWPPP will be prepared prior to construction as a condition of OEPA's NPDES General Permit that is required for the Project. The SWPPP will prescribe specific erosion and sediment control measures to be used and the location in which these measures will be implemented. Generally, structural erosion control devices such as straw bales, berms, and check dams will be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff from exposed areas of the site. Silt fences will be installed prior to starting each phase of work to effectively retain sediment where erosion would occur in the form of sheet and rill erosion (e.g., clearing and grubbing, excavation, embankment, and grading).

(v) Methods to Protect Vegetation

Tree clearing has been minimized with the site design and will result in 15.7 acres of tree clearing and/or tree trimming. Vegetation surveys conducted for the Project did not identify any sensitive vegetative communities or plant types, therefore, no specific vegetation protection methods are needed. Additional details regarding vegetative management during construction is presented in Exhibit I.

(vi) Disposing of Downed Trees, Brush, and Other Vegetation

Any vegetation removed during construction will be segregated, stockpiled, and hauled off site by a waste disposal service.

(vii) Avoidance Measures for State and Federally Listed and Protected Species and Habitat

To minimize impacts to federally and state-listed T/E species, the Project has been sited, to the extent practicable, within previously disturbed areas, such as agricultural fields and along existing farm roads and forest edges. The minimal tree clearing associated with Project construction will be conducted outside the bat summer roosting season to avoid potential impacts to Indiana and northern long-eared bats.

DOW has recommended that construction in dry grasslands, hayfields, and pastures habitat types be avoided during the upland sandpiper nesting period (April 15 to July 31) and construction in

potential northern harrier nesting habitat be avoided between May 15 and August 1. However, construction is expected to occur during these nesting periods to keep the project on schedule. Coordination with the Ohio Division of Wildlife regarding avoidance and minimization strategies is ongoing. However, through ongoing coordination and direction by ODNR, prior to the April 15 start of the nesting season, grassland areas will be mowed to a low heightthat is unsuitable for upland sandpiper. The short height of vegetation will be maintained throughout the nesting season. The short vegetation height could be more attractive to upland sandpiper, therefore ODNR has recommended nest surveys when work is occurring in potential habitat during the nesting window. Nest surveys will be conducted according to survey protocols established by the ODNR. If nest locations are identified despite the low vegetation, a buffer will be established around the nest location and will be clearly marked for avoidance until after the nest is vacated or nesting season has ended.

(3) Potential Impact to Ecological Resources During Operation and Maintenance

(a) Evaluation of the Impact of Operation and Maintenance on Undeveloped Areas and Animals

Adverse impacts to ecological resources during operation and maintenance of the Facility, including undeveloped areas, are not anticipated. O&M activities may include but is not limited to site visits for firmware updates, fixing faulty equipment, vegetation management, snow removal, and regularly scheduled inspection and maintenance of electrical equipment and post construction stormwater management controls. A light-duty vehicle will be used for the maintenance. Gravel roads will be installed to provide site and inter-row access with the Project.

(b) Procedures to Avoid, Minimize, and Mitigate Impacts of Operation and Maintenance

Once the Project is in operation and site restoration of the Project Area is complete, no impacts on water resources are expected. Operation of the Project will not involve the discharge of water or wastewater into streams or water bodies, nor will Project operation require the use of water for cooling or other activities. Therefore, no measurable impacts on the quality and quantity of surrounding water resources (including wetlands, surface waters, and groundwater) are anticipated. Grasses and other invasive plant species will be managed through mowing and spot

applications of herbicides. Additional details regarding vegetative management during O&M is presented in the Vegetation Management Plan developed for the Project (Exhibit I).

(c) Post-construction Monitoring of Wildlife Impacts

Post-construction monitoring of wildlife is not anticipated as no adverse impacts to wildlife species are expected.

(C) LAND USE AND COMMUNITY DEVELOPMENT

(1) Land Use in the Region and Potential Impacts of the Facility

(a) Land Use Map

Figure 8-5 is a 1:24,000 scale map depicting the following features within 1 mile of the Project Area:

(i) The proposed Facility
(ii) Land use
(iii) Structures
(iv) Incorporated areas and population centers

(b) Structures Near the Facility

Table 8-5 and 8-6 provides additional detail related to the proximity of identified structures to Project facilities, specifically:

(i) Structures within 1,500 feet (457.2 meters) of the generation equipment, the distance between the structure or property line and the equipment;
(ii) Structures within 250 feet (76.2 meters) of a collection line, access road, or other associated components, the distance between both the structure and the property line and the associated facility; and
(iii) Lease status of the property.

There is a total of eight residences and one out building within 1,500 feet (457.2 meters) of generation equipment (e.g., solar modules, inverters, or substations) as shown in Table 8-5.

Table 8. 5 Structures Within 1,500 Feet of a PV Panel

Structure Type	Participation Status	Distance Between Structure and PV Panel (Feet)	FID
Residence	None	440.8	3
Residence	None	460.4	19
Out Building	None	492.3	14
Residence	None	514.9	10
Residence	None	579.0	20
Residence	None	883.9	28
Residence	None	985.1	30
Residence	None	1315.4	8
Residence	None	1379.2	33

There is a total of 59 parcels within 1,500 feet (457.2 meters) of generation equipment (e.g., solar modules, inverters, or substations) as shown in Table 8-6.

Table 8. 6 Parcel Boundaries Within 1,500 Feet of a PV Panel

Parcel ID	Participation Status	Distance Between Parcel and PV Panel (Feet)	FID
20000118000	Participating	891.1	17
20000122000	Participating	630.0	114
20000123000	Non-Participating	964.7	33
20000124000	Participating	0.0	84
20000125000	Participating	235.7	102
20000128000	Participating	0.0	50
20000129000	Participating	0.0	99
20000130000	Participating	748.0	115
20000131000	Non-Participating	989.0	68
20000134000	Participating	0.0	82
20000139001	Non-Participating	457.8	31
20000141000	Participating	1437.6	12
20000143000	Participating	229.7	63
20000145000	Participating	0.0	111
20000145001	Non-Participating	682.6	28
20000145003	Non-Participating	957.0	43
20000146000	Participating	0.0	128
20000147000	Participating	0.0	11
20000148000	Participating	0.0	87
20000149000	Participating	0.0	106

Parcel ID	Participation Status	Distance Between Parcel and PV Panel (Feet)	FID
20000150000	Non-Participating	530.3	21
20000150001	Non-Participating	499.7	73
20000151000	Participating	0.0	124
20000154000	Participating	0.0	90
20000155000	Participating	588.1	107
20000155001	Non-Participating	749.8	58
20000155002	Participating	1088.1	75
20000155003	Non-Participating	1465.0	22
20000155004	Participating	633.6	36
20000155005	Participating	265.0	88
20000155006	Participating	263.2	4
20000155007	Participating	306.2	57
20000155008	Participating	295.3	105
20000155009	Participating	1045.1	10
20000155010	Participating	878.0	62
20000156000	Participating	0.0	110
20000157000	Participating	0.0	24
20000158000	Non-Participating	92.3	79
20000159014	Non-Participating	985.5	135
20000160008	Non-Participating	1025.8	55
20000165000	Participating	484.2	70
20000166000	Participating	0.0	23
20000167000	Participating	660.9	39
20000167005	Participating	837.9	56
20000171000	Non-Participating	637.7	126
20000172000	Participating	0.0	8
20000173000	Participating	184.0	93
20000174000	Participating	0.0	108
20000175000	Participating	0.0	64
20000176000	Participating	0.0	80
20000179000	Participating	340.5	96
20000221000	Participating	0.0	40
20000244000	Non-Participating	1374.0	42
20000245000	Non-Participating	1145.7	125
20000258000	Participating	0.0	38
20000263000	Non-Participating	314.5	26
20000265000	Participating	608.2	13
20000280000	Participating	274.5	71
20000280001	Non-Participating	0.0	119

There are no residences within 250 feet (76.2 meters) of a facility component. However, there are 11 parcel boundaries within 250 feet of a project component as shown in Table 8-7.

Table 8. 7 Parcel Boundaries Within 250 Feet of a Facility Component

Structure Type	Lease Status of Underlying Parcel	Facility Component	Distance Between Structure and Component (Feet)	FID
20000172000	Participating	Roadway	0.0	8
		AC Collection	135.7	
		DC Collection	0.0	
20000147000	Participating	Roadway	0.0	11
		AC Collection	0.0	
		DC Collection	0.0	
20000166000	Participating	Roadway	0.0	23
		AC Collection	0.0	
		DC Collection	0.0	
20000157000	Participating	Roadway	0.0	24
		AC Collection	0.0	
		DC Collection	0.0	
		Weather Stations	224.2	
20000221000	Participating	Roadway	0.0	40
		DC Collection	0.0	
20000128000	Participating	Roadway	0.0	50
		AC Collection	0.0	
		DC Collection	0.0	
20000176000	Participating	Roadway	0.0	80
		DC Collection	0.0	
20000134000	Participating	Roadway	0.0	82
		AC Collection	0.0	
		DC Collection	0.0	
20000124000	Participating	Roadway	0.0	84
		AC Collection	0.0	
		DC Collection	0.0	
20000148000	Participating	Roadway	0.0	87
		AC Collection	0.0	
		DC Collection	0.0	
20000154000	Participating	Roadway	0.0	90

Structure Type	Lease Status of Underlying Parcel	Facility Component	Distance Between Structure and Component (Feet)	FID
		AC Collection	0.0	
		DC Collection	0.0	
		Weather Stations	0.0	
20000129000	Participating	Roadway	0.0	99
		AC Collection	0.0	
		DC Collection	0.0	
		Weather Stations	0.0	
20000149000	Participating	Roadway	0.0	106
		AC Collection	0.0	
		DC Collection	0.0	
20000174000	Participating	Roadway	0.0	108
		DC Collection	0.0	
20000151000	Participating	Roadway	0.0	124
		AC Collection	0.0	
		DC Collection	0.0	
20000146000	Participating	Roadway	0.0	128
		AC Collection	0.0	
		DC Collection	0.0	
20000155004	Participating	Roadway	37.4	36
20000155005	Participating	Roadway	43.0	88
20000155010	Participating	Roadway	74.9	62
20000175000	Participating	Roadway	103.8	64
		AC Collection	135.7	
		DC Collection	93.3	
20000155001	Non-Participating	Roadway	107.0	58
20000145000	Participating	Roadway	115.8	111
		AC Collection	151.2	
		DC Collection	0.0	
20000156000	Participating	Roadway	150.8	110
		DC Collection	118.7	
20000280001	Non-Participating	AC Collection	241.2	119
		DC Collection	0.0	
20000173000	Participating	DC Collection	195.5	93

(c) Evaluation of the Land Use Impacts

The distribution of land use in the Project Area is similar to that of the overall land use in Harrison County. The predominant land use within the Project Area is grassland, approximately 75.8% of the Project Area. Approximately 22% of the Project Area is scrub/shrub, ponds and wetlands, and successional hardwood woodland. The remainder of the Project Area (2.2%) is used for developed land uses (see Table 8.2).

Permanent impacts within the Facility Area include the Project substation (separate filing), inverters, and access roads. Temporary impacts include the construction of solar arrays and underground collection lines. Impacts to successional hardwood woodlands and scrub/shrub habitats for placement of solar arrays are also considered permanent. The Project collection system will be primarily underground, but may include some overhead segments. The Applicant conservatively assumed the entire collection system (outside of the perimeter fence) would be overhead.

Approximately 13.41 acres of grassland, 48.33 acres of scrub/shrub habitat, 15.7 acres of successional hardwood woodlands, and 4.93 acres of developed land will be permanently impacted by the Project. Approximately 525.01 acres of grassland, 1.01 acres of scrub/shrub habitat, 0.02 acres of successional hardwood woodlands, and 6.06 acres of developed land will be temporarily impacted by the Project. Table 8.8 presents permanent and temporary land use impacts anticipated for each Project component.

Table 8. 8 Land Use Impacts

Project Component	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Grassland			
Solar Arrays	503.22	503.22	0.00
Access Roads	12.47	0.00	12.47
Collection Lines	19.25	19.25	0.00
Inverter Pads	0.42	0.00	0.42
Substation	0.52	0.00	0.52

Project Component	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Stormwater Basins	2.54	0.00	2.54
Scrub/Shrub			
Solar Arrays	48.17	0.00	48.17
Collection Lines	1.01	1.01	0.00
Inverter Pads	0.01	0.00	0.01
Stormwater Basins	0.15	0.00	0.15
Successional Hardwood Woodland			
Solar Arrays	15.50	0.00	15.50
Collection Lines	0.02	0.02	0.00
Substation	0.002	0.00	0.002
Stormwater Basins	0.16	0.00	0.16
Developed, High Intensity			
Solar Arrays	5.17	5.17	0.00
Access Roads	4.92	0.00	4.92
Collection Lines	0.83	0.83	0.00
Inverter Pads	0.01	0.00	0.01
Stormwater Basins	0.06	0.00	0.06

The Project is generally compatible with land uses (both current and existing) within the Project Area. This conclusion is based on several considerations. The predominance of grassland use (75.8% of the acreage) in the Project Area and the fact that most of this acreage will remain as grassland was the primary consideration in determining compatibility. Construction and operation of the Project will permanently remove a negligible amount of the overall land in the area from its current land use.

(d) Structures to be Removed or Relocated

There are no existing structures located in the Applicant Project Area.

(2) Wind Farm Map

The Project is not a wind farm; therefore, this section is not applicable.

(3) Setback Waivers

No setback waivers are applicable to this Project as it is not a wind farm.

(4) Land Use Plans

(a) Formally Adopted Plans for Future Use of the Project Area and Surrounding Lands

There are no portions of the Project Area in Harrison County with formally designated future uses.

(b) Applicant's Plans for Concurrent or Secondary Uses of the Site

The Applicant has no plans for concurrent or secondary uses of the site.

(c) Impact on Regional Development

The Project is expected to aid regional development by increasing local tax revenues and contributing to the local economy, as shown in Exhibit L, the Socioeconomic Study Report and discussed in OAC Section 4906-4-06(C) of this application. Aside from these benefits, including an anticipated increase in funding to schools, the Project is not expected to significantly impact housing, transportation system development, or other public services and facilities.

(d) Compatibility with Current Regional Plans

This Project is compatible with the local infrastructure goal to advance the alternative energy portfolio within Ohio. It also does not interfere with existing land uses or promote development that is not planned in the area.

Neither Harrison County nor Belmont County have a Comprehensive Plan. Additionally, the local townships and villages do not have current comprehensive plans. The following area plans are available to guide development in the region and the Project's compatibility with those plans is evaluated.

- Harrison County Economic Development Plan (2016) – This strategic plan lays out how Harrison County can build an environment for success today and for future generations. The plan calls for developing a comprehensive and sustainable infrastructure to attract commercial, industrial, and residential growth, including addressing the use and development of abandoned mine lands (AML). The county would work with private developers and other stakeholders to evaluate the feasibility of solar and wind farm development. They would also create an alliance with power companies to conduct studies to create an independent power producer base in the county. The economic development plan also has a specific Energy goal to address the requirements of Ohio Senate Bill 221's mandate by 2025 to advance 25% Alternative Energy Portfolio throughout Ohio, including investigating the feasibility of developing solar panel farms.

- Belmont County Economic Development Plan (Belmont County Commissioners 2011) – While no components of the Project are located within Belmont County, major access to the Project can be through SR 9 and I-70 in Belmont County. The plan does not identify the area along the SR 9 corridor between the Project and St. Clairsville as one for development priority, but does note that action steps to attract new manufacturing and industry, in general, should be a focus on business sectors that bring the highest value to reclaimed land.

- Ohio Mid-Eastern Governments Association (OMEGA) Comprehensive Economic Development Strategy Report (2019 and 2020) – This annual report updates the 2017 report that presents a comprehensive regional overview and analysis of important issues that impact regional growth, including, but not limited to workforce, infrastructure, land use. More than one half (56.02%) of the OMEGA region is classified as forested land. Pastured land, hay and cultivated crop land are about 31% of regional land use, consistent with past years. Less than 10% of the total region is developed; this includes both higher-and lower-intensity development. The development rate for the state is 13.75% (OMEGA, 2019). The 2020 update indicates the extreme lack of developable sites and notes that AMLs limit economic development. Sites located on AMLs generally require costly remediation before being developed leading to a lack of competitiveness with other areas. Remediation of

AML is needed to transform vacant, unusable land into a productive use that leads to business development and more jobs. The Study Area is in a rural area that does have some challenges for new infrastructure and improved utilities. Additionally, topography can have an impact on access to the rural areas in the region. It is anticipated that the location of the Project along a state route and proximity to I-70 will not result in challenges for access during construction. Also, the Project's land use is identified as mostly reclaimed mine land and is anticipated to have a positive impact as it transforms once unusable land into usable land for economic development in the county and region.

(e) Current Population Counts and 10-year Population Projections

The most recent population counts from the U.S. Census estimate that the population for Harrison County in 2019 was 15,040. The township of Athens is the nearest populated place to the Project and had an estimated population of 472 in 2019. The 10-year population projection for Harrison County is 15,100 people. The population decline rate over the last decade for township of Athens has been 7%.(Ohio Office of Research 2019).

(D) CULTURAL AND ARCHAEOLOGICAL RESOURCES

(1) Recreation Areas and Registered Landmarks

Figure 8-6 depicts recreation areas, recreational trails, and registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance within a 10-mile radius of the Project boundary. No scenic rivers were identified within the 10-mile radius (Exhibit F). Scenic routes and byways are identified as part of the VIA, but are not depicted within the mapping.

(2) Impacts on Registered Landmarks

Data for registered landmarks of historic, archaeological, or other cultural significance were reviewed for geographic areas within the Project boundary and 10 miles of the Project boundary (i.e., the Study Area). Data including archaeological sites and historic aboveground structures was obtained from the Ohio Online Mapping System (OMS). The review of this data resulted in a list of known archaeological and architectural resources (Exhibit F).

Additional studies on registered landmarks included a review of Ohio Genealogical Society (OGS) cemetery data, which is a part of the OMS data. This analysis was conducted for geographic areas within the Project boundary and a 2-mile radius of it (Exhibit E).

Esri geographic information systems (GIS) data also was used to identify religious institutions (e.g., churches), cemeteries, and schools. These data are provided in Exhibit F, as well as within Appendix A of the Visual Impact Assessment (VIA).

Within the Project boundary, two previously recorded archaeological sites were identified as part of the desktop review of OMS data; no NRHP-evaluated or previously surveyed architectural resources are located within the Project boundary. The two archaeological resources have not been evaluated for their NRHP eligibility.

In addition to these resources, 247 archaeological sites and 673 architectural resources are located within the Study Area. Among the 247 archaeological sites, two are NRHP-listed (one of which is an archaeological historic district). Among the 673 architectural resources, three are NRHP-listed districts, nine NRHP-listed buildings, and 62 determined eligible by the Ohio State Historic Preservation Office (SHPO) (Exhibit F).

A desktop review of OGS cemeteries also was conducted. This analysis showed that six cemeteries were present within 2-miles of the Project boundary. As shown in the dataset from OMS, the OGS cemeteries were not evaluated with respect to NRHP criteria. Among the six cemeteries identified, two are extinct with all markers and remains destroyed, two are neglected, and two are maintained (Exhibit E).

The Esri GIS data shows the presence of 23 churches and 52 cemeteries within the 10-mile Study Area. In addition, seven schools are present.

In addition to the review within the 10-mile Study Area, a review of archaeological resources within the Project boundary and within a 1-mile radius of the Project boundary was conducted;

this is provided in Exhibit D. This desktop review was submitted to the Ohio SHPO via email on July 6, 2021. This response is pending; it will be submitted to the OPSB upon receipt.

Likewise, an additional review of architectural resources was conducted within the Project boundary and within a 2-mile radius of the Project boundary; this is provided in Exhibit E. This desktop review will be submitted to the Ohio SHPO. As indicated above, OGS cemetery information from the OMS data was included as part of this review.

(3) Impacts on Recreational Areas

The impacts on recreational areas are evaluated as part of the VIA conducted by WSP USA Inc. The findings are summarized herein; the VIA report is provided as Exhibit W.

The assessment of visual resources indicates that there are 35 recreational areas (e.g., parks, Ohio Department of Natural Resources (ODNR) trails, ODNR points of interest) within 10 miles of the Project Area (the Project Area is defined in the VIA as the approximately 1,200 acre area encompassing the footprint of the proposed solar facility [i.e., arrays and associated infrastructure], work areas for construction and operation of the facility, and access and security; the Study Area is defined as Project Area and the geographic area incorporated within a 10-mile radius of the Project boundary). Among these resources is the Jockey Hollow Wildlife Area; this resource overlaps the Project Area near Route 519. All remaining identified recreational resources are located over 3 miles from the Project boundary.

(4) Visual Impact

(a) Visibility and Viewshed Analysis

As part of the VIA, WSP conducted a viewshed analysis. This analysis was created using ESRI ArcGIS 10.7 software to determine locations which could have views of the Project. In order to conduct the viewshed analysis a model was creating with an assumed maximum aboveground level height of 15 feet (4.6 meters) for the solar modules and an observer eye level of 5.5 feet (1.7 meters). A grid of observation points within the buildable area of the entire layout served as the input point/observer feature for the tool parameter. The viewing distance zone did not exceed 12

miles (19.3 km). Earth curvature and atmospheric corrections were considered. This viewshed raster created was a bare-earth digital terrain-based model (i.e., without vegetation height added).

Figure 8-7 depicts the results of the viewshed analysis and area of visual effect within a 10-mile radius of the Project Area. The viewshed presented in Figure 8-7 represents a "worst-case" scenario in which no, or very limited, visual screening measures are present within the vicinity of the Project Area. The viewshed model does not account for individual viewer characteristics that may affect actual visibility.

(b) Existing Landscape and Scenic Quality

The existing landscape and scenic quality of the Project Area is comprised of natural features, including areas of scattered shrubs, grasslands, and deciduous trees; industrial infrastructure; and other man-made features, such as roadways, pipeline clear-cuts, drill pads, and utility poles and lines. Potential viewers largely consist of travelers utilizing the public roads, which border the Project (e.g., Jockey Hollow Road), and visitors to the wildlife area.

As part of the VIA, a desktop visual resource inventory (VRI) was conducted. A VRI documents the visual resources present in the area of interest. In total, the desktop VRI analysis identified 127 resources within 10 miles of the Project, including three parks, two ODNR wildlife areas, one ODNR state park (Barkcamp State Park), one State Forest (Harrison State Forest), one ODNR nature preserve (Emerald Hills Nature Preserve), 21 ODNR trails, five ODNR points of interest, one mine-safety training area, 23 churches, seven schools, 52 cemeteries, eight NRHP-listed individual buildings, and two NRHP-listed historic districts.

The VIA utilized geographic information system (GIS) data from the National Park Service for NRHP-listed buildings and districts; Ohio Department of Natural Resources for wildlife areas, state parks and forests, preserves, trails, points of interest, and lands; and ESRI for churches and cemeteries, schools, and parks and recreation resources. Esri data also was reviewed for federal lands and golf courses, but no resources were identified.

This VIA did not account for data acquired as part of the cultural resources desktop analyses for archaeological and architectural resources, which utilized data from the OMS (Exhibit F). The OMS data, as discussed above, also includes one additional NRHP-listed historic district for above-ground resources and one archaeological district.

While two of the Ohio Department of Transportation byways (see below) were included in the VIA, they were not accounted for in the total numbers for the desktop VRI, which was based on GIS data from NPS, ODNR, and Esri. Exhibit F notes only one scenic byway within 10-miles of the Project.

WSP also reviewed available comprehensive and land use plans within 10 miles of the Project Area to determine if any particular visual resources were noted within Harrison, Belmont, Jefferson, and Guernsey counties and the City of St. Clairsville for their scenic or visual qualities and characteristics.

The Harrison County Ohio Strategic Plan for Economic Development lists a number of strategic statements relative to the development of the county. While no specific strategic statements related specifically to the visual environment, the Plan does include a strategic statement for the County to develop and support recreational resources and tourism and to encourage people and businesses to visit, invest in, and locate to Harrison County.

Belmont County's Economic Development Strategy (Belmont County 2011) addresses goals for the future development of the county. One of the goals of the plan is to promote Belmont County's superior quality of life, work to preserve and improve it, and market the County's distinctive attractions to those within and outside of the County. The plan calls out scenic byways and trails.

The Jefferson County Land Use Plan County does not have regulations specific to visual resources, but the County does encourage building and maintenance standards that protect adjoining land uses from visual impacts (Jefferson County 2013).

The Guernsey County Comprehensive Strategic Plan does not list any visual or scenic goals. However, the County does note a plan for the Cambridge/Guernsey County Visitors and

Convention Bureau, which focuses on tourism and cultural and historical resources. As part of this component, goal number five is a marketing plan. This marketing plan includes an objective to host experiences that appeal to national travelers, particularly in outdoor recreation (Guernsey County 2019).

The City of St. Clairsville in Belmont County has zoning codes and regulations related to industrial development. These codes were established to preserve and utilize natural topography and geologic features, scenic vistas, trees, and other vegetation, while preventing disruption of normal drainage patterns (City of St. Clairsville 2018).

In addition to the municipal plan review, the Ohio Byways Program was reviewed. This program is administered by the Ohio Department of Transportation; it seeks to enhance traveling experiences throughout the state and to heighten awareness of the scenic, cultural, historical, archeological, recreational, and natural resources; the program could be viewed as having scenic guidelines. The Ohio Department of Transportation Scenic Byways Plan contains goals/objectives that allow for the maintenance of scenic byways. As shown in this plan, at least small portions of the Tappan-Moravian Trail, Historic National Trail, and Drovers' Trail byways are within 10-miles of the Project boundary (i.e., the Study Area for the VIA).

(c) Landscape Alterations and Impacts

The Project will result in varying levels of visual alteration/impact when viewed from locations outside the Project Area, but within the Study Area (i.e., within 10 miles of the Project boundary). The visibility and potential visual impacts will diminish as the Project is viewed from greater distances; changes in the visual environment will be noticeable for those areas directly adjacent to the Project. Upon completion of the Project, new visual elements will be added to the existing visual environment.

Sensitivity to changes in the visual environment will depend on viewer type and the duration of the views. The prominence and extent or degree of visual impact of visual changes will vary for viewers within the Study Area as the distance from visual elements increases and as the amount

of trees, vegetation, and land cover between the viewer and Project will screen new visual elements.

(d) Visual Impacts to Cultural and Archaeological Resources

A desktop landmark analysis was conducted by WSP identifying known cultural and archaeological and architectural resources within 10 miles of the Project boundary utilizing OMS data. As noted, this desktop analysis identified 249 archaeological resources and 673 architectural resources based on OMS data.

As discussed in OAC Section 4606-4-08(D)(2) of this application, the applicant has contacted the SHPO in relation to landmarks pertaining to archaeological resources located within the Project boundary and within one-mile of the Project boundary. Information regarding the submittal to the SHPO of the desktop analysis for architectural resources within the Project boundary and within 2-miles of the Project boundary will be forthcoming.

(e) Photographic Simulations

WSP staff visited the Study Area to verify the potential visibility of the Project (i.e., the results of the viewshed analysis) on June 12 and 13, 2021. Photographs were taken from the identified resources from the VRI using a Nikon D3400 digital camera mounted on a tripod. To create photographs as close as possible to what a human would experience, photographs were taken at the height of an average viewer's eye (approximately 5 feet 5 inches above ground level [1.7 meters]).

Five viewpoints were selected for the visual simulations (i.e., a photographic montage of the existing conditions with the Project overlain). The visual simulations are intended to illustrate anticipated visual changes associated with the Project – all are located within 2 miles of the Project. The five viewpoints were selected to illustrate views from the north, east, south, and west of the Project and to account for the variety of visual resources present in the Study Area and identified as part of the VRI. The selected viewpoints were intended to provide a representative picture of the various types of affected views that observers may have of the Project.

To create the simulations, a detailed digital elevation model was used to capture the landscape within the Project Area. This model, coupled with Global Positioning System data, control points, and metadata information captured in the field, allowed the analysts to accurately place the Project facilities in the right location and orientation within the view of each photograph and to appropriately scale, orient, and position the Project. The simulations allowed for a comparison between the existing conditions and the conditions when the Project is built.

(f) Visual Impact Minimization

In order to minimize potential visual impacts associated with the Project, Nottingham Solar LLC will limit vegetation removal to areas directly impacted by construction or to areas that will affect the shading for the Project. Any disturbed grass or other vegetated areas will be reseeded after construction is complete. In particular, vegetation will be restored within laydown and staging areas. Where potential impacts may occur during construction, Nottingham Solar LLC also may consider the use of opaque fencing in laydown and staging areas.

In addition, the Applicant will review Viewpoints 15 and 16 from the VIA in order to evaluate the possibility of reducing the Project's visual impact on Residences 1 (40600 Stumptown Road) and 2 (41520 State Route 519) by installing a vegetative screen. Before a possible plan can be developed, the Applicant will need to review the following:

- Property ownership in areas outside Applicant-controlled land where a vegetative screen could be installed.
- Utility restrictions on installing vegetation near power lines and/or limiting access to power lines for maintenance.
- Department of Transportation safety guidelines and restrictions on installing vegetation near roadways and property entrances.
- The quantity and type of vegetation that may be required.

Upon completion of the review, the Applicant will determine the feasibility of installing a vegetative screen at Residences 1 and 2.

(E) AGRICULTURAL DISTRICTS AND POTENTIAL IMPACTS TO AGRICULTURAL LAND

(1) Mapping of Agricultural Land

The Project Area does not contain agricultural land. Current land use of the Project Area is reclaimed strip mine.

(2) Agricultural Information

(a) Acreage Impacted

The Project Area does not contain agricultural land.

(b) Evaluation of the Impact of Construction, Operation, and Maintenance of the Proposed Facility

(i) Field Operations

The Project Area does not contain agricultural land.

(ii) Irrigation

The Project Area does not contain agricultural land.

(iii) Field drainage systems

The Project Area does not contain agricultural land.

(iv) Structures used for Agricultural Operations

The Project Area does not contain agricultural land.

(v) Viability as Agricultural District Land

The Project Area does not contain agricultural land.

(c) Avoidance and Mitigation Procedures During Construction, Operation, and Maintenance to Reduce Impacts to Agricultural Land, Structures, and Practices

The Project Area does not contain agricultural land.

(i) Avoidance or Minimization of Damage to Field Tile Drainage Systems and Soils

The Project Area does not contain agricultural land.

(ii) Timely repair of Damaged Field Tile Systems

The Project Area does not contain agricultural land.

(iii) Segregation of Excavated Topsoil Decompaction and Restoration of Topsoil

The Project Area does not contain agricultural land.

4906-4-09 REGULATIONS ASSOCIATED WITH WIND FARMS

The Project is not a wind farm; therefore, these regulations are not applicable.

References

Belmont County Commissioners. 2011. Belmont County Economic Development Strategy, May 2011. Accessed April – July 2021 at: https://belmontcountycommissioners.com/wp-content/uploads/2015/06/StrategicPlan2011.pdf.

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