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March 2, 2023

Ms. Tanowa Troupe
Secretary
Docketing Division, Ohio Power Siting Board
The Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793

RE: Application of Chestnut Solar, LLC for a Certificate of Environmental Compatibility and Public Need to Construct and Operate the Chestnut Solar Project
Case No. 22-0988-EL-BGN

Dear Ms. Troupe:

Chestnut Solar, LLC hereby transmits the enclosed standard certificate application ("Application"), which has been completed in accordance with the requirements of Ohio Administrative Code Chapters 4906-3 and 4906-4 and filed in compliance with Ohio Administrative Code ("OAC") 4906-2-02(D)(4). As set forth in the Application, Chestnut Solar proposes to construct and operate a 68 MW solar-powered electric generation facility (referred to as the Chestnut Solar Project) in Pleasant Township, Marion County, Ohio.

Chestnut Solar has concurrently furnished confidential versions of Application papers electronically filed with redactions (for which protective treatment is sought) to the Docketing Division. Additionally, Chestnut has requested partial waiver of OAC Rules 4906-4-08(A)(5)(c) and 4906-4-08(D). None of the information presented in the pre-application notification letter, filed on October 27, 2022, has changed.

Pursuant to OAC Rule 4906-2-04, please be advised of the following:

Name and Address of Applicant:

Chestnut Solar, LLC
C/O NARENCO
801 Wood Ridge Center Dr., Suite A
Charlotte, NC 28217

Name and location of the facility:

Chestnut Solar Project,

The facility will be located in Pleasant Township, Marion County, Ohio.

Applicant's representative:

Ben Friedell
Executive Vice President of Development and M&A
Chestnut Solar, LLC
801 Wood Ridge Center Dr., Suite A
Charlotte, NC 28217

Attorney for Applicant:

Devan K. Flahive, Esq.: Attorney for Chestnut Solar, LLC
PORTER, WRIGHT, MORRIS & ARTHUR LLP
41 South High Street, Suite 2900
Columbus, OH 43215
(614) 227-1989 / (614) 227-2100 (fax)
dflahive@porterwright.com (*Willing to accept service via e-mail*)

A notarized statement that the information contained in the Application is complete and accurate pursuant to OAC Rule 4906-2-04(A)(3)(e) is attached as Attachment 1. Should Staff of the Ohio Power Siting Board desire further information or discussion of this Application, please don't hesitate to contact me.

Very truly yours,

Devan K. Flahive
Counsel of Record for Chestnut Solar, LLC

ATTACHMENT 1

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of Chestnut Solar, LLC for a Certificate of Environmental Compatibility and Public Need to Construct and Operate the Chestnut Solar Project	)	Case No: 22-0988-EL-BGN

ACKNOWLEDGEMENT OF BENJAMIN FRIEDELL

I, Benjamin Friedell, being duly sworn and cautioned, state the following:

I, as the Executive Vice President of Development and M&A at National Renewable Energy Corporation, am the authorized representative of Chestnut Solar, LLC (the Applicant in this case) and affirm that the Application filed in this matter is true and accurate to the best of my information and belief.

Benjamin Friedell
Chestnut Solar, LLC

State of North Carolina)
) ss:
County of Mecklenburg)

Sworn and subscribed before me this 1st day of March, 2023.

SANJA C. RYAN
Notary Public
Mecklenburg
County
My Comm. Exp.
10-21-2023
NORTH CAROLINA

Notary Public

CHESTNUT SOLAR, LLC

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

OPSB Case Number 22-0988-EL-BGN
March 2023

PUBLIC VERSION

BEFORE THE
OHIO POWER SITING BOARD

Standard Certificate Application for Electric Generation Facility

LIST OF TABLES

LIST OF FIGURES

LIST OF EXHIBITS

Acronyms and Abbreviations

AC	Alternating Current
AEP	American Electric Power
ANSI	American National Standards Institute
Applicant	Chestnut Solar, LLC
ASCE	American Society of Civil Engineers
BMP	Best Management Practice
dBA	A-weighted decibels
EJSCREEN	Environmental Justice Screening and Mapping Tool
EMF	electromagnetic field
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
GIS	geographic information system
HDD	Horizontal Directional Drilling
HHEI	Headwater Habitat Evaluation Index
HSA	hollow stem augers
IEEE	Institute of Electrical and Electronics Engineers
JEDI	Jobs and Economic Development Impacts
kV	kilovolt
kWac/year	kilowatt alternating current per year
kW_{DC}	kilowatts DC
MW	megawatt
NA	not applicable
NEC	National Electrical Code
NESC	National Electrical Safety Code
NHL	National Historic Landmarks
NLCD	National Land Cover Databases
NPDES	National Pollutant Discharge Elimination System
NPV	net present value
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
OAI	Ohio Archaeological Inventory
ODNR	Ohio Department of Natural Resources
ODNR-DOW	Ohio Department of Natural Resources - Division of Wildlife
ODOT	Ohio Department of Transportation
OEPA	Ohio Environmental Protection Agency
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
ORAM	Ohio Rapid Assessment Method
OSHA	Occupational Safety and Health Administration
PEM	palustrine emergent
PFO	palustrine forested
PHWH	Primary Headwater Habitat
PILOT	payment in lieu of taxes
PJM	PJM Interconnection, LLC
POI	Point of Interconnection

Project	Chestnut Solar, LLC's 68 MW Project in Marion, Ohio
PSS	palustrine scrub-shrub
PUCO	Public Utilities Commission of Ohio
PV	photovoltaic
QHEI	Qualitative Habitat Evaluation Index
RAPID	Research and Public Information Dissemination
RFI	Radio frequency interference
RUMA	Road Use Maintenance Agreement
SIS	System Impact Study
SWPPP	Stormwater pollution prevention plan
SWPA	Source Water Protection
TMY	Typical Meteorological Year
TVI	Television interference
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VSA	Visual Study Area

STANDARD CERTIFICATE APPLICATION OF CHESTNUT SOLAR, LLC FOR 68-MW ELECTRIC GENERATION FACILITY

4906-4-01 Purpose and Scope

(A) General

Chestnut Solar, LLC (hereinafter referred to as "Applicant" or "Chestnut Solar") is proposing to construct the Chestnut Solar Project ("Project"), an alternating-current ("AC") solar-powered electric generation facility ("Facility") rated for an output of up to 68 megawatts (MW) in Marion County. The materials contained herein and attached hereto constitute Chestnut Solar's Application for a Certificate of Environmental Compatibility and Public Need (Certificate) to construct and operate the Facility.

This Application was prepared by Chestnut Solar in accordance with the filing requirements for standard certificate applications set forth in Ohio Administrative Code ("OAC") Chapters 4906-3 and 4906-4, with support from Environmental Consulting & Technology, Inc. and Stantec Inc.

(B) Waivers

The Ohio Power Siting Board ("OPSB") may, upon an application or motion filed by a party, waive any requirement of this chapter other than a requirement mandated by statute. By separate motion filed in this case docket, Chestnut Solar is requesting partial waivers of OAC Rules 4906-4-08(A)(5)(c) and 4906-4-08(D). Chestnut Solar's motion asks the Ohio Power Siting Board ("Board") to defer required submission of a plan for additional test borings and to approve more focused study areas for cultural/historical resources impacts (2 miles) as well as visual impacts (5 miles).

4906-4-02 Project Summary and Applicant Information

(A) Project Summary

Chestnut Solar is proposing to construct an AC solar-powered electric generation facility with a rated capacity of up to 68 MW in Marion County, Ohio. This Facility will consist of solar photovoltaic (PV) panel arrays, underground and overhead electrical collection lines, inverters, access roads, a perimeter fence, a Facility substation, operations and maintenance (O&M) storage container(s), meteorological (met) stations, and laydown yards. The Project will connect to the PJM Interconnection, L.L.C. (PJM) regional transmission grid via a new point of interconnection (POI) switchyard to be owned and operated by AEP Transmission Company, Inc., ("AEP") at the Facility site. Chestnut Solar's Facility substation will connect directly to AEP's three-breaker ring bus (at the POI switchyard) via a generator step-up transformer. The POI switchyard will be adjacent to the existing North Waldo – Wildcreek 138 kilovolt (kV) Transmission Line.

(1) General Purpose of the Facility

The purpose of the Project is to provide clean, efficient, and cost-effective renewable energy to the bulk power transmission system that serves the needs of electric utilities and their customers in Ohio from the grid operated by PJM. The Project will generate electricity using virtually no fuels or water and without producing air pollutants, emissions, or waste. This Project will meet regional and national needs for a more diverse energy portfolio that will include a higher percentage of energy generated through use of renewable resources.

(2) General Location, Size, and Operating Characteristics

The Project will be located in Marion County, Ohio, approximately 4 miles southeast of downtown Marion in Pleasant Township, east of Marion-Waldo Rd and west of Highway 23. The total Project area encompasses up to 562 acres

under lease. Based on the current Project design, however, the area occupied by components and infrastructure necessary for operation of the Facility will encompass approximately 404 acres ("Facility Footprint"). A final Facility design will be submitted prior to construction reflecting specific placement and models of components, though Applicant has made considerable effort to depict the Facility layout in its final form to the extent possible at this stage of development. Applicant's preliminary site plan is provided in Exhibit A. The studies included in this Application were completed for either all 562 acres under lease or within the Facility Footprint, as applicable based on the individual resource.

The Facility will consist of arrays of ground-mounted solar panels on a single-axis tracking system. There will be approximately 19 inverters which will convert the electricity generated by the solar panels from direct current (DC) to alternating current (AC). There will be approximately 19 step-up transformers which will increase the voltage from 600 V to 34.5 kV. The electricity will then be collected and routed through a series of medium voltage (MV) underground and/or overhead electric collection lines through the main project substation which will step up the voltage to 138 kV. The Facility substation will connect directly via a generator step-up transformer to AEP's new POI switchyard, which in turn delivers electricity to the regional transmission grid. The Project is configured for a nameplate/rated capacity of 68 MW AC at the point of interconnection to AEP's system. A detailed description of each Project component can be found in Section 4906-4-03(B) in this application.

(3) Suitability of Site

Applicant has determined the Project area to be suitable for utility-scale solar development based on the following factors: accessibility to available

transmission capacity, landowner interest, compatible land use, economic analysis, low population density, few environmentally sensitive areas, and optimal site conditions. For more details regarding the suitability and selection of the site, please refer to section 4906-4-04(A) of this Application.

(4) Schedule

After identifying the Project area as suitable for solar development, lease agreements were signed with the landowners in Q4 2016. The project was then submitted to PJM to begin interconnection studies in Q3 2017. Chestnut Solar received favorable System Impact Study (SIS) results from PJM in Q4 2019. After the completion of the Facilities Study, Chestnut Solar then executed both an Interconnection Service Agreement (ISA) and an Interconnection Construction Service Agreement (ICSA) with PJM and AEP as of Q2 2022. Throughout this time frame, Applicant has conducted further Project due diligence, including environmental, engineering, and cultural resource studies. Additionally, beginning in 2019, a series of informal meetings have been held with local stakeholders to discuss a solar farm at this location.

In accordance with OAC Rule 4906-3-03, a public information meeting was held on December 6, 2022, to facilitate public interaction with the Applicant's representatives regarding the Project as now presented in this Application, to answer questions from the local community, and to gather additional input.

Because the Applicant is a subsidiary of licensed EPC contractor National Renewable Energy Corporation (NARENCO), the Applicant anticipates that NARENCO will be the EPC contractor for the Project; this determination will be finalized at least 12 months prior to construction. Final design will be completed as early as Q3 2024. Construction is anticipated to begin shortly after Board approval and be completed by Q4 2025, at which point the Facility

will be placed in service. Additional information about the Project schedule can be found in section 4906-4-03(C)(1) of this Application.

(B) Future Plans in Region

(1) Additional Electric Power Generation Units

Chestnut Solar does not currently have any future plans for additional capacity at this site. The Project's POI has a maximum capacity of 68 MW.

(2) Description of Applicant and Operator

The Project will be constructed, operated, and maintained by Chestnut Solar: a wholly-owned subsidiary of National Renewable Energy Corporation (NARENCO) formed specifically for the purpose of developing the Project. Founded in 2009 in Charlotte, NC, NARENCO is an industry leading solar engineering, procurement and construction (EPC) firm and independent power producer (IPP) focused on the development, construction, and operations of utility scale solar projects. NARENCO's portfolio consists of 300+ MW of solar in operation or under construction; 250+ MW of active operations and maintenance contracts; and an active development pipeline of 1,000+ MW of proposed projects. NARENCO has extensive experience in the Carolinas with a focus on continued growth in the Southeast and Midwest regions.

4906-4-03 Project Description and Schedule

(A) Project Area Description

(1) Geography and Topography Map

Figure 3-1 depicts the geography and topography within a 2-mile radius of the Project Area, developed using publicly available data from agencies such as the U.S. Environmental Protection Agency (USEPA) and the U.S. Geological Survey (USGS) (see full list in the figure notes). The following features are included:

(a) The proposed facility

The preliminary Facility layout includes the fence line, PV panel arrays, underground and overhead electrical collection lines, inverters, step-up transformers, access roads, Facility substation, POI switchyard (not part of this Application), O&M storage container, and laydown yards contained within the Project Area. The Applicant expects that the final layout will remain substantially similar to the preliminary Facility layout. However, due to ongoing technological innovations in the solar industry, continuing detailed engineering and survey work, public comments, and communications with Staff during the siting process, the precise location of these features within the Project Area may be subject to engineering adjustments. Nonetheless, all Facility components will be sited within the Project Area as provided in this Application and will be subject to any Certificate conditions required by the Board.

(b) Population centers and administrative boundaries

The Facility will be located in Pleasant Township in Marion County, Ohio. The nearest population center is the City of

Marion, approximately 4 miles northwest of the Project location. The Project is about 40 miles north of Columbus, Ohio.

(c) Transportation routes and gas and electric transmission corridors

The Project area is bounded by US Highway 23 to the east, Somerlot Hoffman Rd E to the north and Maple Grove Road to the west. The Project area is bisected by Myers Road and Owens Rd E. Other nearby major routes include Marion-Waldo Rd to the west and Marion-Cardington Rd E to the north. There are two commercial airports within 10 miles of the project: the Marion Municipal Airport located about 5 miles north of the Project and Packer Airport located about 10 miles southwest of the Project. There is also a private airfield, called Soltis Field Airport, located within the 2-mile buffer of the Project to the southwest. The Sandusky District railway line runs north-south through the 2-mile buffer, outside of the Project area to the west (Ohio Rail Development Commission, 2021).

An active natural gas transmission line that is owned by Columbia Gas Transmission Company, a TC Energy company, passes underground through the northern portion of the Project Area. As shown in Exhibit A, Chestnut Solar accounted for this pipeline in designing the site. A surveyor determined the extent that the pipeline easement crosses the Project site in order for Chestnut Solar to ensure that all operational fixtures/equipment will be constructed at least fifty feet away. Because there is a planned access road across the pipeline easement, Chestnut Solar will obtain approval from TC Energy prior to construction. To ensure the safety of construction personnel and neighboring residents, Chestnut Solar has already begun this coordination

with TC Energy. Chestnut Solar will also work with TC Energy to implement all proper precautions for construction and operation of the Project in the pipeline vicinity.

In January 2023, Chestnut Solar submitted its crossing request application to TC Energy, which included relevant information about Project construction, including the specific location of the access road (encroachment), the nearest E-911 address, property ownership information, the expected use of the encroachment (over/under), the expected weight of vehicles (over) or size of bore pipe (under), and a representative drawing example of the expected use. These papers are currently under review by TC Energy. Chestnut Solar expects to set up a site visit with TC Energy for the purpose of confirming pipeline depth, after which Chestnut Solar will conduct a survey of the specific proposed encroachment location. That survey, along with information gathered during the site visit, will then be incorporated into a site-specific drawing detail of the intended encroachment location and use for submission to and verification/approval by TC Energy.

Once TC Energy approves the drawing details and encroachment application, Chestnut Solar anticipates that there may be conditions to which it must adhered during and post-construction. Notwithstanding other conditions, Chestnut Solar will, prior to construction, coordinate with an 811 service for the encroachment location and notify TC Energy 48 hours prior to performing any construction at the encroachment location. During construction, Chestnut Solar will monitor the

encroachment location to ensure the depth requirements of aggregate are maintained as well as comply with TC Energy's "Minimum Guidelines for Construction near Pipeline Facilities." Post-construction, Chestnut Solar will submit an as-built survey to TC Energy, if required. During operations, Chestnut Solar's O&M team will monitor compliance with any conditions required by TC Energy.

As an alternative, Chestnut Solar can modify the site plan to remove the access road from Somerlot Hoffman Rd E and change the location of the laydown area and O&M facilities to be adjacent to a different Project access road.

There are no hazardous liquid pipelines within 2 miles of the Project Area (USDOT, 2021). The North Waldo – Wildcreek 138 kV Transmission Line runs through the southern portion of the Project Area.

(d) Named rivers, streams, lakes, and reservoirs

There are three named rivers within 2 miles of the Project area, but none within the Project boundary. Qu Qua Creek runs in a North-South direction west of the Project. Grave Creek and Rifle Creek run in a North-South direction east of Project. There are two streams within the Project limits, but both are unnamed tributaries that flow into off-site Qu Qua Creek. Exhibit K contains further information on surface water features within the Project area.

(e) Major institutions, parks, and recreational areas

There are three religious centers within two miles of the Project area: Community United Methodist Church and Marion Christian Center are located approximately two miles north of the Project and Saint Johns Church is roughly two miles east of the Project. Within the two-mile buffer there is also the Kings Mill Golf Club to the east and a portion of the Delaware Wildlife Area to the south.

(2) Project Area Properties

A total of 562 acres of private property are under lease within the Project Area. The Facility will permanently occupy an operating footprint of approximately 404 acres within the Project Area, entirely on private land secured through long-term lease agreements with the landowners. Temporary impacts from equipment laydown areas and backfilling of collection lines will affect 7.5 acres during construction. These areas will be restored once construction has been completed. Permanent impacts of roughly 28.1 acres during operation will result from up to 20.1 acres of access roads, 2.0 acres for the substation, 0.7 acre for inverters, and 0.9 acre for an O&M building. An additional 360.4 acres of land will be covered by solar module arrays but will be fully vegetated during operation of the Project. The 10 individual parcels that comprise the Project Area are listed in Table 3-1. As designed at this stage, Project infrastructure will not be constructed on all the parcels.

Participating Landowners		
Parcel Number	**Lease Status**	**Approximate Size (Acres)**
250220002000	Leased	124.02
250220002103	Leased	4.26
250220001400	Leased	51.34
250230000100	Leased	10.56
250230000700	Leased	79.78

250230001200	Leased	55.08
250230002201	Leased	33.14
250230002200	Leased	31.10
250380001700	Leased	46.49
250380000100	Leased	126.17

Table 3-1. Participating Landowners

(B) Detailed Description of Proposed Generation Facility

A detailed description of the Facility is provided in the subsections below. Equipment specifications presented in this Application are representative of that which will be selected for the final procurement of Facility components and materials. Final equipment specifications, characteristics, and dimensions will be provided to Board Staff prior to construction. Any changes in equipment specifications from what is presented here are not expected to increase potential impacts.

(1) Generation Equipment

(a) Type, number of units, estimated net demonstrated capacity, heat rate, annual capacity factor, and hours of annual generation

Generation equipment is anticipated to include approximately 170,500 monocrystalline, bifacial PV panels, mounted on single axis trackers and installed in linear arrays. PV modules will be oriented East/West along the long axis, known as portrait orientation, per the single axis tracker manufacturer's instructions. PV modules will be wired in a series of "strings," each approximately 26 to 27 units. Strings will extend North/South and aggregate in one, two or three strings per tracker motor. Modules will rotate a maximum of 120 degrees in the East/West direction daily.

The actual type of PV panel chosen will depend on final procurement options and availability for equipment prior to construction. Typical PV panels consist of crystalline silicon wafers arranged in columns and electrically connected in series via soldered wire to form three circuits that are connected in parallel via a junction box mounted on the rear of the module. Similar architecture is present on both the front and back of the module to form a bifacial module. Anti-reflective tempered glass covers both sides of the module. The glass is sealed from the elements using silicon caulk. An aluminum frame mechanically encases the glass module to form a rigid unit capable of withstanding applicable wind and snow loads. Representative solar panels under consideration are provided in the Manufacturing Specifications in Exhibit B. The panels will operate continuously but will not produce electricity during nighttime hours. The annual net capacity factor for the Facility is estimated to be 23% to 25%. Based on the total generating capacity of 68 MW AC, the Facility will generate approximately 147,000 MWh of electricity each year. Heat rate is not applicable to solar energy facilities.

The anticipated solar panel model is the Adani bifacial ASB-M10-144-AAA 540-Watt module or similar. The approximate number of panels needed for the Facility is 170,500. Regardless of the specific model, the solar modules will be approximately 3 to 4 feet wide by 6 to 7 feet tall and approximately 1 to 2 inches deep. Manufacturer specifications for the Adani module are provided in Exhibit B. In addition, manufacturer specifications for potential tracking systems and inverter models that may be

used by the Project are also included in Exhibit B. As discussed in Section 4906-4-08(A)(1)(c), all equipment procured for the Project will be compliant with applicable Underwriters Laboratories (UL), Institute of Electrical and Engineers (IEEE), National Electrical Code (NEC), National Electrical Safety Code (NESC), and American National Standards Institute (ANSI) listings. If the Applicant uses a technology other than those included in Exhibit B, the corresponding manufacturer specification will be provided to the Board no later than 30 days prior to the start of construction.

Chestnut Solar anticipates that the Facility will include a NEXTracker, Array Technologies, or similar racking system and SMA or similar inverters. Inverter step-up transformers will also be utilized to step up the voltage from 600 volts to 34.5 kilovolts. Manufacturer specifications for racking systems and inverters being considered are also included in Exhibit B.

(b) Wind Turbine Dimensions

Solar panels generate electricity without the use of wind turbines. Therefore, this section is not applicable to the Facility.

(c) Fuel quantity and quality (i.e., ash, sulfur, and British thermal unit value)

Solar panels generate electricity without burning fuel. Therefore, this section is not applicable to the Facility.

(d) Pollutant Emissions and Quantities

Solar panels generate clean, emission free electricity without releasing airborne pollutants. Therefore, this section is not applicable to the Facility.

(e) Water Requirements

Solar panels generate electricity without the use of water. Therefore, no water is consumed, treated, or discharged, and this section is not applicable to the Facility. When water is intermittently required to clean the PV panels, it will be trucked in from an off-site source.

(2) Construction, Site Preparation, and Reclamation Methods

Facility construction includes the following primary steps: (1) installation of storm water, erosion control, and vegetation protection measures; (2) clearing vegetation where necessary; (3) minor earthwork or grading where necessary; (4) securing the perimeter of the areas in which construction will occur; (5) construction of 3 miles of new access roads; and (6) installation of equipment such as pilings, racking, panels, inverters, met stations, the Facility substation, POI switchyard, and fencing to secure the site. The Project anticipates minimal clearing and grading as required to allow the installation of the single axis tracking system within manufacturers specifications. In areas where vegetation removal is required, disturbed soil will be de-compacted and topsoil will be replaced and re-seeded. Tree removal is not anticipated for this project. Additional details concerning site preparation are included in the subsections below as well as in Sections 4906-4-07 and 4906-4-08 of this Application.

(a) Solar Modules and Racking System

Solar modules are installed on steel posts that are approximately 6 inches by 9 inches tall. Posts are typically 12 to 16 feet long and are driven 7 to 11 feet (2.1 to 3.4 meters) below grade, depending on soil conditions; depth will be confirmed upon a final geotechnical study. Because the topography of the Project area is generally flat, minimal grading is anticipated for the

installation of the solar modules. Posts are primarily installed by pile drivers. Pile driving for post installation will be completed with diesel-powered, tracked vehicles using a single hydraulic ram. The pile driver can accommodate post lengths up to 15 feet using standard equipment or up to 20 feet with extensions. The pile driver will lift the steel beam into place and push the beam approximately 1 foot into the ground surface. Laborers will check for plumb as the pile driver operator makes minute lateral adjustments. Once plumb is confirmed, the laborer will exit to a safe distance of two times the height of the post. The pile driver operator will apply successive rapid taps to the top of the post until the final post height is reached.

The Project, as designed, would require installing approximately 26,500 steel posts. Modules are supported on posts with the help of a racking mechanism. The number of PV modules present on site are not the same as the number of steel posts and will vary depending on the module wattage. The anticipated solar panel is the Adani bifacial ASB-M10-144-AAA 540-Watt module or similar. The approximate number of panels needed for the Facility is 170,500. The approximate dimensions of the modules are 3.7 feet wide by 7.4 feet tall. All-terrain forklifts are used to deliver steel racking structures to construction personnel. Once the posts are driven into the ground, racking mechanisms are installed and modules are then bolted to the racking frame. Where soil disturbance is necessary, topsoil will be segregated and redistributed following the disturbance activity to maintain soil productivity.

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

A site-specific Spill Prevention, Control and Countermeasure (SPCC) Plan shall be developed for both the construction and ongoing maintenance of the site. Diesel fuel for construction vehicles and equipment will be stored in appropriate vessels with secondary containment. Fuels shall be dispensed in the temporary laydown yards and away from any stream or wetland areas. Installed PV panels generate electricity without the use of fuel and generate no waste byproducts. Broken solar modules shall be disposed of in accordance with federal, state and local guidelines. Construction water for dust control shall be non-potable and stored in specifically designed trucks.

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

PV panels generate electricity without the use of fuel or water, and without generating waste. Therefore, the Project does not include any fuel, waste, water, or other processing facilities.

(d) Water supply, effluent, and sewage lines

The Project will include one or two O&M container(s), neither of which will have permanent piping or appurtenances for water supply, effluent, or sewage lines. Chestnut will contract with a licensed water/wastewater services operator as necessary.

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

No new gas pipelines or electric distribution lines will be associated with the Project. Chestnut Solar's Facility substation will connect directly to AEP's three-breaker ring bus (at the POI switchyard) via a generator step-up transformer.

(f) Electric collection lines

Electric power produced by the solar PV panels will be directed to inverters via underground cables, where the direct current (DC) voltage will be converted to AC. From there, the electric collection system will consist primarily of underground collection lines, which will transmit the electricity to the Facility substation. Approximately 133,000 linear feet of AC collection cables will be installed throughout the Project, using either directional bore or open trench methods, depending on site conditions. Directional bore will typically be used under roads or existing jurisdictional ditches, if applicable. The estimated surface disturbance for this is approximately 20 feet by 20 feet at the inlet and outlet. A total of 41,139 feet of trenching (for collection lines) will be needed. Trenching dimensions will be approximately 4 feet wide and between 3 and 4 feet deep. All collection lines will be underground except for at the POI; the electrical lines will be aboveground where the Project substation connects to the utility's system. Overhead lines will extend approximately 100 feet from the Chestnut Solar's Generator Step Up (GSU) transformer to the utility switchyard via galvanized steel structures bolted to concrete foundations. Overhead lines within the utility switchyard are routed to a Gang Operated Air Brake (GOAB) and finally terminated to the utility transmission line. All overhead lines are supported by steel structures designed for the purpose. Replacement of spoil material will occur immediately after installation of the buried collection lines. Subgrade soil will be replaced around the cable, and topsoil will be replaced at the surface. All areas adjacent to the open trench will be restored to original grades and surface

condition. Restoration of these areas will be completed through seeding and mulching of all exposed soils. Re-vegetation of the area is detailed in the Landscape Plan (Exhibit C).

(g) Substations, switching substations, and transformers

At the Facility substation, the voltage of the electric current supplied from the inverters will be increased to 138 kV for transmission to the new POI switchyard. The preliminary Facility design includes up to 19 inverters, each with a nominal output of 840 kilowatts (kW). Each inverter measures 3.6 feet long by 3.6 feet wide by 6.2 feet tall. Up to six inverters will be placed on a single skid that provides the foundation for the inverters, transformer, equipment cabinet, and Supervisory Control and Data Acquisition (SCADA) system. Each skid will be placed on helical piles driven to a depth of 7-7 feet below grade. The skid will be fastened or welded to the helical piles. The final height of skid base will be between 3-6 inches above level grade.

The Facility substation will be located on a parcel under lease with a participating landowner. It is currently anticipated that the combined footprint of the substation and switchyard will be approximately 250 feet by 250 feet wide within the approximately 2-acre substation area shown in the preliminary Facility layout. (See Exhibit A.) The tallest component is a transmission structure for the line loop, which will not be higher than the existing transmission infrastructure on the Project site currently supporting the 138 kV lines. The Facility substation will house the transformers and other necessary infrastructure to step up the medium voltage electricity from 34.5 kV to 138 kV,

for transmission to the new adjacent POI switchyard and interconnection with the electric grid.

The planned location of the Facility substation is shown in Exhibit A. This location was chosen based on multiple criteria. This location is within the solar Facility Footprint directly adjacent to the existing transmission line that runs through the Project area. The substation will be south of the transmission line and in the east-central portion of the site to avoid any proximity to residential homes. It will be set back 650 feet from a home on Myers Road to minimize any audible or visual impacts on the neighbors. The Sound Report (Exhibit O) monitored the sound at this location (specifically, ML-3) to ensure no sound would be audible above ambient noise. Vegetative screening is planned between the Project substation and the home. These buffer locations are shown in the Preliminary Site Plan (Exhibit A), which correspond to the module simulations in the Figures section of the Visual Resource Assessment and Mitigation Plan (Exhibit V).

The Facility substation and its connection to AEP's POI switchyard will be designed according to best utility practices, PJM Standards, the National Electrical Code (NEC), the National Electric Safety Code (NESC) and the Institute of Electrical and Electronics Engineers (IEEE). Areas within the Facility substation will be graveled to minimize vegetation growth in the area, reduce fire risk and mitigate hazardous step and touch potentials. The Facility substation and POI switchyard will each be enclosed by fencing as required by the NESC.

Grading requirements and final engineering will determine the erosion and sedimentation features for the Facility substation construction. Typically, one or two temporary sedimentation basins will be installed to capture runoff from the Facility substation pad during construction. A silt fence will surround at least three sides of the substation with diversion ditches to the sedimentation pond per the SWPPP.

(h) Temporary and permanent meteorological towers

The Facility will include up to four met stations with pyranometers, and other equipment designed to measure solar irradiance and other related weather conditions. These pyranometers will be mounted to the PV racking systems and located in conjunction with other meteorological measuring equipment such as temperature sensors, soiling stations, anemometers, and albedometers, and will be approximately 4 to 10 feet in height.

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

The Facility will require the construction of approximately 3 miles of new access roads, to be located as shown in Exhibit A. Access roads will be gravel surfaced and up to 20 feet wide along straight portions, slightly wider at curves and at internal road intersections. Wherever feasible, existing roads and farm drives will be upgraded for use as Facility access roads in order to minimize impacts to active agricultural areas, natural communities, and wetland/stream areas. Where existing roads or farm drives are unavailable or unsuitable, road construction will involve topsoil stripping and grubbing of stumps, as

necessary. Any grubbed stumps will be removed, chipped, buried, or otherwise disposed of as directed by the landowner and as allowed under federal, state, and local regulations. Subsoil will be graded, compacted, and surfaced with gravel or crushed stone at a depth to be determined on a case-by-case basis. A geotextile fabric or grid will be installed beneath the road surface, if necessary, to provide additional support.

During construction, access road installation and use could result in temporary soil disturbance width of approximately 20 feet, with occasional turnaround segments up to 50 feet in width. Once construction is complete, temporarily disturbed areas will be restored, including removal of excess road material and rocks greater than 6 inches. Stormwater requirements under roads shall be managed using swales and culverts with inlet/outlet protection.

(j) Construction laydown areas

Up to four laydown yards of approximately 1.5 acres each are proposed for the Facility. The laydown yards will accommodate localized construction activities within the Project Area. These laydown yards will be utilized until construction crews have completed installation of Facility components in the applicable portion of the Facility. The laydown yards will accommodate material and equipment storage, construction trailers, and parking for construction workers. The laydown yards will be equipped with temporary erosion and sediment control methods and stripped of topsoil. Woodchips, construction matting, or gravel may be used to accommodate laydown

activities. Following completion of localized construction activities associated with a specific laydown yard, temporary cover will be removed, soil will be de-compacted, topsoil will be redistributed, and the area will be reseeded as appropriate to the specifications of the Landscape Plan (Exhibit C). The laydown yard adjacent to the Facility substation will be used for parking once the Project is operational.

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

The Facility will be surrounded by small-wildlife-permeable fencing 6 feet tall with regularly spaced posts. Lighting will be in accordance with the Lighting Plan included as Appendix B to the Landscape Plan (Exhibit C). There will be one or two permanent O&M container(s) for replacement parts and service equipment, each approximately 40 feet long by 10 feet wide, and up to 10 feet tall, and will likely be located adjacent to the Facility substation. The parking area is anticipated to be up to 1,000 square feet in area.

Control and monitoring of the Facility will be accomplished through the use of a SCADA system. The SCADA system provides status views of electrical and mechanical data, operation and fault status, meteorological data, and grid station data. For security, the Facility will be fenced and access to the Facility will be through lockable gates.

(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 the requirements of relevant permitting jurisdictions.

(3) Need for New Electric Transmission Line(s)

There is no need for new electric transmission line construction between the Facility substation and AEP's POI switchyard. The Facility's electrical configuration directly connects the Facility substation with AEP's POI switchyard via a generator step-up transformer.

(4) Project Area Map

Prepared at a 1:12,000 scale, Figure 3-2 illustrates the following features:

(a) An aerial photograph, developing from ESRI World Imagery map service
(b) The proposed facility, including all components discussed in Section 4906-4-03(B)(2)
(c) Road names
(d) Property lines

(C) Detailed Project Schedule

(1) Project Schedule

The Project schedule is provided in Figure 3-3 and includes the following milestones:

(a) Acquisition of land and land rights

The Project will be built on private land under lease to the Applicant, as detailed in Section 4906-4-06(A). Acquisition of the

Project land rights began in mid-2016 with land analysis and landowner outreach. Lease negotiations were finalized in late 2016. Once the Facility is placed in service, the land is expected to be leased for at least 45 years.

(b) Wildlife and environmental surveys/studies

Wildlife, environmental, and cultural surveys/studies were initiated in Q1 2018; a list is below, and results are summarized in Sections 4906-4-06 and 4906-4-08:

- Landscape Plan (Exhibit C)
- Wetland and Waterbody Delineation Report (Exhibit K)
- Ecological Assessment Report (Exhibit P)
- Groundwater, Hydrogeology, and Geotechnical Report (Exhibit Q)
- Historic Architectural Reconnaissance Survey (Exhibit R)
- Phase I Archaeological Field Reconnaissance (Exhibit S)
- OHSPO Consultation Letters (Exhibit T)
- Threatened and Endangered Species Agency Consultation (Exhibit X)
- Critical Issues Analysis (Exhibit Y)
- Cultural Desktop Survey (Exhibit Z)
- Vegetation and Habitat Assessment (Exhibit AA)
- Phase I Environmental Site Assessment (Exhibit BB)

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

Interconnection studies for queue position AD1-106 commenced in the third quarter of 2017 and concluded in Q1 of 2022. A Feasibility Study was issued in April 2018, a System Impact Study was issued in December 2019, and a Facilities Study was issued in February 2022. An Interconnection Services

Agreement (ISA) and Interconnection Construction Services Agreement (ICSA) were executed in Q2 of 2022. In an effort to comply with the schedule requirements for Facility construction and the milestones associated with the ICSA, Chestnut requested a one year suspension of the construction milestones in the ICSA, as is the Project's option, to better align with the siting and permitting process.[1] Interconnection studies for queue position AH1-075 commenced in Q3 of 2021 and are still ongoing. Feasibility Study results are expected in January of 2023.

(d) Preparation of the Certificate Application

Chestnut Solar's preparation of this Certificate Application has occurred throughout 2022. The formal public informational meeting was held on December 6, 2022, at Tri-Rivers Career Center in Marion, Ohio.

(e) Submittal of the application for certificate

This Application was electronically submitted in the first quarter of 2023.

(f) Issuance of the certificate

The Applicant anticipates that, if the Board approves this Project, a Certificate will be granted by the fourth quarter of 2023.

(g) Preparation of the final design

[1] As of the date of this Application submittal, Applicant has invoked its right to suspend the ISA and ICSA. This request was made to PJM and AEP in January 2023 in order to align the milestone dates and construction timeline with the OPSB's review and decision on this Application. Chestnut Solar estimates that suspension will last twelve to eighteen months but is allowed up to 3 years under the PJM Open Access Transmission Tariff.

The Applicant anticipates that preparation of the final design and detailed construction drawings will commence in the first quarter of 2024 and be completed by the third quarter of 2024.

(h) Construction of the facility

Construction of the Facility is planned to commence as early as the third quarter of 2024 and be completed by the fourth quarter of 2025.

(i) Placement of the facility in service

The Facility will be placed in service upon completion of construction, expected by the fourth quarter of 2025.

(2) Construction Sequence and EPC Contractor Selection

Construction will begin after the necessary permits are received. Project construction will begin with workforce mobilization and the initial site preparation work, including securing perimeter of area, grading, placement of erosion control measures, 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 the racking system. Minimal grading may be required for the Facility substation, POI switchyard, and the O&M container(s), but access roads will be constructed at grade when possible.

Next, general site improvements will be made such as access improvements and preparation of the construction laydown area. The Facility components (racking system, PV solar modules, collection system, and inverters) will be installed after the construction of access roads. Project construction will be organized into blocks, and multiple blocks may be constructed concurrently (e.g., Facility substation with PV array sites).

The solar commissioning process of configuring and verifying that all of the PV components are properly designed, installed, and optimized will be conducted prior to placing the Facility in service. As portions of the Project near completion, temporary laydown areas will be vacated, and disturbed areas will be re-seeded and re-vegetated consistent with the Landscape Plan (Exhibit C). Once installation is complete, placement of the O&M container(s) and associated permanent infrastructure (storage, lighting, etc.) will be completed. All temporary restroom and waste facilities will be removed upon completion.

After construction, temporarily disturbed areas, including the construction laydown area, will be restored. While only minimal grading of the site is anticipated, 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 the requirements of relevant permits.

(3) The applicant shall describe the potential 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 or the Applicant's ability to procure a certain type of PV solar module or other Facility components. Such delays may push the in-service date back, which would cause significant financial burden to the Applicant, as discussed in Section 4906-4-06(D). The Applicant anticipates utilizing a Federal Investment Tax Credit (ITC) of 30% under current law. An impact of delays beyond 2032 could be that the ITC will be lower than 30%.

4906-4-04 Project Area Selection and Site Design

(A) Project Area Selection

Applicant considered both constraining factors and positive qualitative and quantitative criteria to select the Project area, such as: accessibility to available transmission capacity, landowner interest, compatible land use, economic analysis, and evaluation of site conditions.

(1) Study Area Description

Applicant's initial screening process identified the target market of PJM because there is competitive demand for clean energy assets. Ohio, located within the PJM territory, also offers a Renewable Portfolio Standard (RPS) to encourage solar development in the state by offering another revenue stream for developers through the sale of Renewable Energy Certificates (RECs) generated by solar facilities. In addition, data was obtained from the National Renewable Energy Laboratory's (NREL) National Solar Radiation Database (Sengupta, et al., 2018). This data, in the form of Typical Meteorological Year (TMY), was analyzed using PVsyst, a solar power system modeling software that is standard in the industry. Modeling production of potential solar farms in Ohio produced results consistent with currently operational projects in the region and competitive with most all types of power generation in the wholesale power market in Ohio. The irradiance and operational assumption based on the described data sets as well as tangible operating history of similar projects confirmed the competitiveness of solar and confirms a suitable solar resource throughout much of Ohio, including Marion County.

Applicant also considered topography and land use characteristics of the Project area. The land in the Project area is primarily agricultural and features open spaces suitable for hosting a solar power project.

Other important factors include feasibility of access to major transportation routes for procuring materials and equipment as well as to the bulk power transmission system for delivery/sale of electricity. High-voltage electric power transmission lines are located in the vicinity of the Project area. The transmission lines there are owned and operated by AEP. The capacity of these transmission lines was evaluated, and it was determined that a 68 MW project was viable in this Project area. Additionally, the transmission line and the point of interconnection to deliver the project output are located directly on the Project site allowing for a seamless integration with the power grid.

(2) Study Area Boundary Map

Included as Exhibit D is a map of the PJM territory, which includes thirteen states and the District of Columbia. The Project is sited in the AEP territory of Ohio shown in light blue. A map of the Project Area is provided in Figure 2-1.

(3) Siting Criteria

The qualitative siting criteria utilized were landowner interest and compatible land use, such as agricultural land with minimal slope and water features, low population density, and limited residential development. Additional qualitative analysis includes the evaluation of site conditions undertaken by the Applicant, such as environmental site investigations, cultural surveys and accessibility for construction. The results of these surveys have supported the use of the Site for solar development and will be further discussed in later sections of this application. Quantitative siting criteria include accessibility to available transmission capacity and economic analysis.

Proximity to an existing transmission line was identified using a geographic information system containing both parcel data and existing transmission line locations. Accessibility of transmission capacity was determined upon receiving favorable study results from PJM based on the Project POI. Economic analysis is highly dependent on the interconnection cost. Based on the PJM study results, Applicant's modeling forecasted that the income generated by the Project would exceed the costs to interconnect the Project. No weighting factors were applied to these criteria; in other words, each criterion was determined to be equally necessary to site selection.

Additionally, the Applicant successfully acquired the land rights needed for Project development through private lease agreements for contiguous areas of land adequate for the Facility Footprint, as further described in Section 4906-4-06(A).

(4) Process By Which Applicant Utilized Siting Criteria

To find specific sites in Ohio ideal for solar development, Applicant performed geospatial analysis in QGIS. That analysis identified land parcels with the following characteristics: (1) access to existing transmission infrastructure; (2) limited slope; (3) land clear of wetlands, flood zones and other waterbodies; and (4) sufficient contiguous space for a utility-scale solar project. Once ideal parcels were identified, the Applicant contacted landowners to gauge interest in participating in a solar project. The landowners agreed to lease the land to the Applicant for development of a solar farm. The Project site was selected as it fits all the criteria described above.

Chestnut Solar also studied environmental justice implications. Using the U.S. EPA Environmental Justice Screening and Mapping Tool (EJSCREEN)[2] and data from the US Census Bureau, Chestnut Solar determined that the Project site will not create adverse socio-economic or environmental justice impacts to minority or low-income populations. The EJSCREEN results for this Project indicate that the Project area population is 94% White, 5% Hispanic and approximately 0% Black and American Indian; 62% of the homes within a 2-mile radius have a median household income of $75,000 or higher. According to the US Census Bureau, the median household income for Marion County was $49,225 (US Census Bureau).

(5) Description of Project Area Selected for Evaluation

Section 4906-4-02(A)(2) of this Application explains the geographic boundaries of the final Project Site located in Marion County. As discussed in Section 4906-4-04(A)(1) above, however, sites across the entire PJM territory in Ohio were considered for the location of the proposed solar facility. Locations were excluded from consideration if they did not fit the criteria defined in the previous paragraphs. Sites were evaluated and would be excluded from consideration for the following reasons:

(1) Extensive water features on site, such as flood zones, wetlands and streams;

(2) Highly sloping land;

(3) Existence of important historical architectural or archaeological features;

(4) Presence of endangered species or critical habitat;

(5) Not enough contiguous space for the proposed solar facility;

(6) Not adjacent to existing transmission infrastructure; and

(7) No available capacity on the transmission system.

[2] The EJSCREEN was designed to allow users to access environmental and demographic information for locations in the United States, and compare their selected locations to the rest of the state, EPA region, or nation. The tool may help users identify areas with people of color and/or low-income populations, potential environmental quality issues or a combination of environmental and demographic indicators that is greater than usual.

Additionally, based on the criteria explained in Section 4906-4-04(A)(3), Chestnut Solar concluded that the Facility site meets all the factors necessary to support a viable, unobtrusive solar energy generation facility. The proposed site offers prime access to the bulk power transmission system, sufficiently low population density, and few environmentally sensitive areas.

(B) Facility Layout Design Process

(1) Constraint Map

A constraint map is included in this Application as Figure 4-1.

(2) Criteria used to determine the facility layout and site design, and a comparison of any site design alternatives considered

Criteria used to determine the Project area and site design included setbacks and land use constraints, environmental considerations, equipment specifications and noise constraints. Project boundaries were set back 300 feet from residences and 100 feet from property lines. Utility corridors and public rights-of-way were located by a surveyor and excluded from the Project Area.

Environmental Considerations

A wetland delineation conducted by Environmental Consulting and Technology, Inc. (ECT) identified two streams, one pond and one wetland in the vicinity of the Project. These water features were excluded from the Project area and the solar panels will have a 50-foot setback from the closest water feature. No trees will be cleared for project development and no known threatened or endangered species will be affected.

Equipment

The equipment layout is based on a DC:AC ratio, which optimizes the electricity produced by the solar panels. The inverters are placed centrally within the design to avoid any sound from outside the project fence.

Noise Constraints

The substation is situated far enough from neighboring homes that the sound should not rise above ambient noise in the area. For additional information on Applicant's sound analysis, see Section 4906-4-08(A)(3).

(3) The applicant shall provide a description of how many and what types of comments were received:

On December 6, 2022, Applicant hosted a formal public informational meeting (PIM) at the Tri-Rivers Career Center in Marion, Ohio during which public comments were solicited. Applicant received thirty written comments from community members at the PIM. In addition, Applicant has received a number of comments through the Project Facebook page (https://www.facebook.com/profile.php?id=100085486419997), the website (http://chestnutsolar.com/) and through the OPSB case docket. The public comments generally assumed adverse impacts to property values, drainage, wildlife or habitat, viewsheds, and local agriculture as well as risk of compromising the underground natural gas pipeline located toward the Project site's northern boundary. A more specific summary of the comments received is enclosed in Appendix C of the Public Interaction and Complaint Resolution Plan (Exhibit G). Chestnut will maintain on the Project website an updated repository of the questions received along with a response to each and, as applicable, reference to its Application.

4906-4-05 Electric Grid Interconnection

(A) Facility Connection to the Regional Electric Grid

Applicant has obtained the necessary approval from PJM to interconnect to AEP's existing North Waldo-Wildcreek 138 kV Transmission Line, which crosses the Project area.

(B) Interconnection Information

The Project's interconnection infrastructure consists of: (1) a Facility substation, including the generator step-up transformer connection; and (2) a new AEP-owned POI switchyard, to be called the West Waldo 138kV station.

(1) The applicant shall provide information relating to their generation interconnection request, including interconnection queue name, number, date, and website

The table below summarizes the two queue positions associated with the Project. The status of these queue positions can be found on PJM's New Services Queue website (https://www.pjm.com/planning/services-requests/interconnection-queues.aspx) by entering the queue numbers into the search box under the "Queue/OASIS ID" column.

PJM Queue Positions					
Queue Number	**Name**	**Queue Date**	**Maximum Facility Output (MW AC)**	**Capacity Interconnection Rights (MW)**	**Status**
AD1-106	North Waldo-Wild Creek 138 kV	09/22/2017	60	22.8	ISA/ICSA signed by Applicant
AH1-075	North Waldo Wild Creek 138 kV	07/29/2021	8	24.7	Feasibility Study in Progress

Table 5-1. PJM Queue Positions

(2) System studies on generation interconnection request

All studies are publicly available for the AD1-106 queue position. The Feasibility Study for the AH1-075 queue position is still in progress. All completed interconnection studies are found in Exhibit E.

Per Applicant's interconnection request status with PJM as of the effective date for S.B. 52, certain statutory provisions enacted by S.B. 52 do not apply to this Project. Specifically, by October 11, 2021, Applicant had already both received a completed System Impact Study from PJM and paid the fee for the Facilities Study to PJM. The System Impact Study referenced above for AD1-106 was issued in December 2019. The Facilities Study Fee was paid by the Applicant to PJM on January 10, 2020, and the Facilities Study Agreement was fully executed January 22, 2020. The uprate request for this project was submitted in July 2021 and a queue position (AH1-075) was assigned in August 2021. Also, because queue position AH1-075 was submitted prior to the effective date of S.B. 52 (October 11, 2021) under the same legal entity as the Applicant, Chestnut Solar's second queue position is equally exempt from certain statutory provisions enacted by S.B. 52 as provided in Section 4(B).

4906-4-06 Economic Impact and Public Information

(A) Facility Ownership

Chestnut Solar has secured all land rights necessary for its operation of the Project through long term leases; Chestnut Solar has no plans to own the real property in fee, but will own and operate all solar generation structures and equipment constructed as part of the Facility.

The Applicant is a wholly owned subsidiary of National Renewable Energy Corporation (NARENCO). Founded in 2009 in Charlotte, NC, NARENCO is an industry leading solar engineering, procurement and construction (EPC) firm and independent power producer (IPP) focused on the development, construction, and operations of utility scale solar projects. NARENCO's portfolio consists of 300+ MW of solar in operation or under construction; 250+ MW of active operations and maintenance contracts; and an active development pipeline of 1,000+ MW of proposed projects. NARENCO has extensive experience in the Carolinas with a focus on continued growth in the Southeast and Midwest regions.

(B) Capital and Intangible Costs

(1) The applicant shall provide estimates of applicable capital and intangible costs for the various alternatives

The total estimated capital and intangible costs of the Facility are expected to be approximately [redacted] Applicant has not proposed alternative project areas. Therefore, no cost comparison between alternatives is available. The costs are broken out in Table 6-1.

Description	Cost
Tangible Cost	
Panels	[redacted]
Civil and Electrical Work	[redacted]
Other	[redacted]
Total Tangible Cost	[redacted]
Intangible Cost	
Development	[redacted]
Insurance	[redacted]
Legal/Other	[redacted]
Total Intangible Cost	[redacted]
Total	[redacted]
Cost per kWAC	[redacted]

Table 6-1. Estimated Capital and Intangible Cost

(2) Cost Comparison Per Kilowatt with Similar Facilities

Installed project costs complied by U. S Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Laboratory) in 2020 indicate that the capital costs of the Facility are less than the industry average cost. The cost per kWAC for the Project is [redacted] Chestnut Solar is the first Project NARENCO has undertaken in Ohio and within the PJM market, therefore there are no similar NARENCO Projects for cost comparison. According to Berkeley Laboratory, the median installed costs of PV declined to $1.4/WAC (or $1.1/WDC) in 2020 down 10 percent from 2019 and down 75 percent from 2010 (Berkeley Laboratory, 2021). Due to supply chain dynamics impacted by the COVID-19 virus, installed costs have increased since 2020.

(3) Present Worth and Annualized Capital Costs

The capital cost for the Project includes development cost, construction design and planning, equipment cost, and construction cost – all of which will be incurred within the 1-2 years of the start of construction. Applicant has not proposed an alternative project area, so capital cost information is limited to

the proposed Facility. Nevertheless, Applicant expects that the relative cost to install this Project will be below the national average due to factors such as the nature of the site, proximity to transmission lines and other reference site selection.

(C) Operation and Maintenance Expenses

(1) The applicant shall provide applicable estimated annual operation and maintenance expenses for the first two years of commercial operation

The estimated annual operation and maintenance expenses for the first two years of commercial operations is [redacted] These costs include materials such as replacement modules or racking, services such as preventative maintenance and vegetation management, and labor. After the first two years, O&M costs are estimated to be [redacted] per year, consisting of: labor, materials and equipment.

(2) Operations and Maintenance Cost Comparison Per Kilowatt with Similar Facilities

O&M costs are a significant portion of the overall operating cost of solar projects but can vary widely amongst facilities depending on size, lifetime of the Facility and operational events. According to Berkeley Laboratory, sample data compiled from 13 utilities report the average O&M costs have declined from about $32 kWAC a year in 2011 to about $16 kWAC a year in 2020 (Bolinger and Seel, 2018).

The O&M costs for this Facility are estimated to be approximately [redacted] kWAC per year. This number was calculated by dividing the estimated yearly O&M cost by the total kWAC for the project. The O&M cost includes labor, materials and services and will vary depending on the maturity of the project. These estimates exclude property taxes, insurance and environmental monitoring. Chestnut Solar is the first Project NARENCO has developed in Ohio and

within the PJM market; therefore, there are no similar NARENCO Projects with which to compare O&M costs. For reference, however, a NARENCO solar project similar in size to Chestnut Solar—but constructed in 2018 in a different grid operator's region—contracted O&M costs at [redacted] kWDC for monitoring, inspection, maintenance work and vegetation management.

(3) Present Worth and Annualized Operation and Maintenance

The annual O&M costs will be subject to real and inflationary increases. The present value of the operations and maintenance cost per kW, assuming a 30-year Facility life, can be calculated using a nominal 9% discount rate and 2% escalation. Based on these assumptions the net present value (NPV) of the O&M costs over the life of the Project is approximately [redacted]. The Applicant has not proposed alternative project areas, therefore capital cost information is limited to the proposed Facility.

(D) Cost of Delays

Monthly timeline delay costs would depend on various factors. Delays that were to occur during the permitting stage would result in losses associated with the time value of money resulting in a delay in the timing of revenue payments. For any delays that would occur during the construction phase, costs would include lost construction days and those associated with idle crews and equipment. Any delays could result in failing to meet a delivery deadline under a potential Power Purchase Agreement, which could trigger liquidated damages or other financial penalties. In addition, significant losses would be incurred if delays prevented the Facility from meeting deadlines to qualify for the existing federal Investment Tax Credit. Prorating these delay costs monthly would not be meaningful, as the lost opportunity is triggered at a single deadline and does not accrue over time.

(E) Economic Impact of the Project

Economic benefits of this Project are described in the "Economic Impact and Land Use Analysis of Chestnut Solar Project" report prepared by Strategic Economic Research, LLC (Exhibit F) using NREL's Jobs and Economic Development Impacts (JEDI) PV Model (PV12.23.16). The JEDI PV Model is an input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output. That is, the JEDI Model takes into account that the output of one industry can be used as an input for another. For example, when a PV system is installed, there are both soft costs consisting of permitting, installation and customer acquisition costs, and hardware costs, of which the PV module is the largest component. The purchase of a module not only increases demand for manufactured components and raw materials, but also supports labor to build and install a module. When a module is purchased from a manufacturing facility, the manufacturer uses some of that money to pay employees. The employees use a portion of their compensation to purchase goods and services within their community. Likewise, when a developer pays workers to install the systems, those workers spend money in the local economy that boosts economic activity and employment in other sectors. The goal of economic impact analysis (as captured in Exhibit F) is to quantify all of those reverberations throughout the local and state economy.

The first JEDI Model was developed in 2002 to demonstrate the economic benefits associated with developing wind farms in the United States. Since then, JEDI models have been developed for biofuels, natural gas, coal, transmission lines and many other forms of energy. These models were created by Marshall Goldberg of MRG & Associates, under contract with the National Renewable Energy Laboratory. The JEDI model utilizes state-specific industry multipliers obtained from IMPLAN (IMpact analysis for PLANning).

IMPLAN software and data are managed and updated by the Minnesota IMPLAN Group, Inc., using data collected at federal, state, and local levels. This study analyzes the gross jobs that the new solar energy project development supports and does not analyze the potential loss of jobs due to declines in other forms of electric generation.

(1) Construction and Operation Payroll

Based on the JEDI Model, direct jobs created during the operational phase last the life of the solar PV project, typically 20-30 years. Direct construction jobs and operations and maintenance jobs both require highly skilled workers in the fields of construction, management, and engineering. These well-paid professionals boost economic development in rural communities where new employment opportunities are often welcome due to economic downturns. Accordingly, it is important to not just look at the number of jobs but also the earnings that they produce. Table 6-2 shows the earnings impacts from Chestnut Solar Project, which are categorized by construction impacts and operations impacts. The new local earnings during construction total over $2.2 million for Marion County and over $6.3 million for the State of Ohio. The new local long-term earnings total over $322,000 for Marion County and over $596,000 for the State of Ohio.

	Marion County	**State of Ohio**
Construction		
Project Development and Onsite Labor Impacts	$1,623,322	$4,246,926
Module and Supply Chain Impacts	$457,370	$1,245,587
Induced Impacts	$125,478	$871,836
New Local Earnings during Construction	**$2,206,170**	**$6,364,349**
Operations (Annual)		
Onsite Labor Impacts	$87,994	$175,628

Local Revenue and Supply Chain Impacts	$150,770	$186,048
Induced Impacts	$84,137	$234,665
New Local Long-Term Earnings	**$322,901**	**$596,341**

Table 6-2. Total Earnings Impact from Chestnut Solar

(2) Construction and Operation Employment Numbers

The results from the JEDI model show significant employment impacts from the Chestnut Solar Project. Employment impacts can be broken down into several different components. Direct jobs created during the construction phase typically last anywhere from 12 to 18 months depending on the size of the project; however, the direct job numbers present in Table 6-3 from the JEDI model are based on a full time equivalent (FTE) basis for a year. In other words, 1 job = 1 FTE = 2,080 hours worked in a year. A part time or temporary job would constitute only a fraction of a job according to the JEDI model. For example, the JEDI model results show 25 new direct jobs during construction in Marion County, though the construction of the solar center could involve closer to 50 workers working half-time for a year. Thus, due to the short-term nature of construction projects, the JEDI model often significantly understates the number of people actually hired to work on the project.

	Marion County Jobs	**State of Ohio Jobs**
Construction		
Project Development and Onsite Labor Impacts (direct)	25	42
Module and Supply Chain Impacts (indirect)	9	22
Induced Impacts	2	16
New Local Jobs during Construction	**36**	**80**
Operations (Annual)		
Onsite Labor Impacts (direct)	1	1

Local Revenue and Supply Chain Impacts (indirect)	3	4
Induced Impacts	2	4
New Local Long-Term Jobs	**6**	**9**

Table 6-3. Total Employment Impact from Chestnut Solar

(3) Estimated County, Township, and Municipal Tax Revenue from the Facility

Solar PV projects increase the property tax base of a county, creating a new revenue source for education and other local government services. Solar energy projects in the state of Ohio can be exempted from tangible personal property and real property tax payments if they meet certain conditions. These conditions are outlined in the Ohio Revised Code (ORC) Section 5727.75. If an applicant is granted exemption from taxation for any of the tax years 2011 through 2023, the Qualified Energy Project will be exempt from taxation for tax year 2024 and all ensuing years, as long as the property was placed into service before January 1, 2024. The amount of Payment In Lieu Of Taxes (PILOT) to be paid annually to the County treasurer is assessed per MW of nameplate capacity, with the rate of $9,000/MW of installed capacity. Assuming an aggregate nameplate capacity of 68 MW, the increase in local tax revenues will be approximately $612,000 annually from the PILOT for the Facility, and approximately $27.5 million over the 45-year life of the Facility.

According to Table 6-4, Pleasant Local School District will receive over $424,000 annually and over $19 million in total over the 45-year life of the Project. The Pleasant Township Fire District will receive over $38,000 annually and over $1.7 million in total over the life of the Project. The Tri-Rivers Joint Vocational School District will receive over $35,000 annually and over $1.6 million in total over the life of the Project. The total taxes paid will be $612,000 annually from the PILOT. Other taxing districts will receive between $1,635 and $35,567 annually as detailed in Table 6-4.

Taxing District	Estimated Annual Government Revenue from PILOT	45-year Total from PILOT
Marion County	$19,623	$883,046
Senior Service	$6,541	$294,349
CSB Children's Services	$29,598	$1,331,928
County Board of Developmental Disabilities	$35,567	$1,600,521
County Board of Developmental Disabilities Capital Improvement	$4,088	$183,968
Alcohol, Drug Addiction, And Mental Health (ADAMH) Board	$8,176	$367,936
Pleasant Township Fire	$38,265	$1,721,940
Pleasant Township General Fund	$8,176	$367,936
Pleasant Township Road & Bridge	$1,635	$73,587
Pleasant Local School District Bond	$69,499	$3,127,455
Pleasant Local School District Current Expense	$301,707	$13,576,834
Pleasant Local School District General Fund	$49,058	$2,207,615
Pleasant Local School District Perm Improvement	$4,088	$183,968
Tri-Rivers Joint Vocational School District Current Expense	$35,976	$1,618,918
TOTAL	**$612,000**	**$27,540,000**
Annual Average		**$612,000**

Table 6-4. Illustration of Government Revenue Paid by Chestnut Solar Project

(4) Economic Impact on Local Commercial and Industrial Activities

New solar development can expand the economy through direct, indirect and induced impacts. Direct impacts during the construction period refer to the changes that occur in the onsite construction industries in which the direct final demand (i.e., spending on construction labor and services) change is made. Onsite construction-related services include installation labor, engineering, design, and other professional services. Direct impacts during

operating years refer to the final demand changes that occur in the onsite spending for the solar operations and maintenance workers.

The initial spending on the construction and operation of the solar PV installation will create a second layer of impacts, referred to as "supply chain impacts" or "indirect impacts." Indirect impacts during the construction period consist of changes in inter-industry purchases resulting from the direct final demand changes and include construction spending on materials and PV equipment, as well as other purchases of goods and offsite services. Utility-scale solar PV indirect impacts include PV modules, invertors, tracking systems, cabling, and foundations.

Induced impacts during construction refer to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes. Local spending by employees working directly or indirectly on the Project that receive their paychecks and then spend money in the community is included. The model includes additional local jobs and economic activity that are supported by the purchases of these goods and services.

(F) Public Responsibility

Applicant has undertaken public engagement efforts to inform the community about the Project as well as about the maximum extent of the Facility footprint (consistent with the layout presented in this Application). In addition to the required public informational meeting, Chestnut Solar has informally met with public officials and area residents in an effort to collaborate on resolving all concrete concerns.

(1) Public Interaction Program During Facility Siting, Construction, and Operation

Applicant has engaged the public via multiple avenues during the siting of the Facility and has reviewed and considered all comments, particularly with respect to Project design. Earlier in the process of Project development, Applicant reached out to the landowners to discuss the project and has continued to remain in contact with them through the development of this Application. Applicant's representatives have visited Marion County numerous times over the past seven years to informally visit with the landowners as well as neighbors and local officials. Visits with local officials have included: (1) attending a public local zoning meeting for Pleasant Township with the Township Trustees in attendance and presenting information regarding the Project in 2020; (2) meeting with the Marion City/County Regional Planning Commission to discuss Project permitting; (3) meeting with Marion County Economic Development to discuss tax incentives for the Project; (4) meeting with Marion County Soil and Water Conservation to discuss best practices for management of existing agricultural land, conservation practices, and site design features; and (5) communicating with local emergency services and fire department at the local meetings as well as meeting with the Township Fire Department. Further, representatives of the Project were in regular communication with the Township Zoning Administrator throughout 2019 and 2020.

In addition to the coordination listed above, Chestnut Solar is currently collaborating with local educational institutions including Ohio State University-Marion Campus, Marion Technical College, and Ramtec Ohio (located in Marion). All three of these institutions provide opportunities for students to continue their education through internships directly and indirectly associated with the Project during the construction and operations project stages. The on-the-job training available will include engineering,

skilled labor, heavy equipment operation, electrical, landscape architecture and communications systems operations among many other disciplines. Currently, the Project is also initiating conversations with the Pleasant Township Schools to outline a pilot educational program that will introduce students to energy systems related professions throughout the construction and operations of the project.

Applicant sent direct mailings to the adjacent property owners on April 6, 2022, informing them of the status of the project prior to initiating field surveys and historical and geotechnical survey work, which was completed by Cardno (now Stantec), in April and May 2022. Additionally, in a direct mailing dated April 6, 2022, Applicant sent all affected and adjacent landowners a schematic with a preliminary layout for the Project, Applicant's contact information, and the domain address for Applicant's website. Applicant also invited the property owners to review the website which includes key summary information about the Project, important milestone dates, a frequently asked questions page and a portal that allows direct questions to be asked of the Applicant through the website. The website went live on April 11, 2022. As the Project continues to progress, the website will post all pertinent information and milestones as well as links to copies of all formal communications with relevant jurisdictional bodies. In addition to the project website, Applicant has set up a Facebook page for the community to communicate regarding the Project (https://www.facebook.com/profile.php?id=100085486419997). On November 16, 2022, Chestnut hosted an informal Open House and provided information about the project to members of the local community. More than 40 members of the community attended the Open House, and 3 members of the Chestnut Solar project team were available to answer questions for two hours. The Open

House was hosted 3 miles from the project site and all members of the community were welcome.

Consistent with the requirements of Ohio Admin. Code 4906-3-03(B), Applicant hosted a formal public informational meeting (PIM) at Tri-Rivers Career Center in Marion, Ohio on December 6, 2022, during which public comments were solicited. Applicant received thirty comments from community members at the PIM. A summary of what Chestnut Solar deems consensus comments is listed below. Chestnut Solar also notes the relevant section(s) of this Application that address each:

- Will neighboring landowners see a decrease in their property values once the solar farm is operational? — 4906-4-08(C)(4)(c); Exhibit U (Property Value Impact Study)
- Will neighbors experience increased drainage issues as a result of the solar farm construction or operations? — 4906-4-08(E)(2)(b)(iii); 4906-4-08(E)(2)(c); Exhibit W (Drain Tile Plan)
- Will there be any negative impacts on wildlife or habitat from the project? — 4906-4-08(B); Exhibit K (Wetland and Waterbody Delineation Report); Exhibit P (Ecological Assessment Report); Exhibit X (Threatened and Endangered Species Agency Consultation); Exhibit AA (Vegetation and Habitat Assessment)
- How will the major gas transmission line under the site be affected? — 4906-4-03(A)(1)(c)
- How will the solar facility impact my view? — Exhibit C (Landscape Management Plan)
- How will hazardous materials used to produce solar panels (cadmium, lead, sulfuric acid, nitric acid, acetone, and trichloroethane) be managed? — 4906-4-08(B)(3)
- Could the site ever be returned to agricultural use? — 4906-4-06(F)(5);

- Exhibit J (Decommissioning Plan)

Applicant will continue to share information and accept public comments via the Project website (http://chestnutsolar.com/) and dedicated Project email (ChestnutSolarLLC@gmail.com). Applicant will post a Q&A log on the Project website which will address questions received at the PIM and through other avenues such as the OPSB docket. A link to this log will be posted on the Project's Facebook page. Applicant will continue to update this log as additional questions are submitted. Applicant also strives to respond directly to individuals who have provided their contact information and to mail an update to individuals who provided comments and disclosed their address as well as to public officials in the Township and County.

Chestnut Solar views community engagement as an ongoing endeavor. Applicant will continue outreach efforts to local public officials and Project neighbors who are receptive to such dialogue. Chestnut endeavors to ensure that everyone in the community will have ample opportunity to ask Project-specific questions – about design, the technology, other features, etc. Applicant expects more specific requests of the Project site to arise as the Application process progresses. Within the bounds of the proposed Project site, studies and permits, Applicant is committed to working with the community and Board Staff to modify plans as reasonably necessary in an efficient manner to accommodate local preferences while adhering to legal/safety/environmental standards.

During the construction of the Project, the Applicant will establish a 24-hour a day, seven day a week hot line for emergency and complaint notices. Applicant will also continue to monitor the project website, as well as accept phone calls and mail at the main office, as outlined in the Public Interaction

Program (Exhibit G). The Applicant has 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 owners and tenants via first class mail. A copy of the Complaint Resolution Plan and the notification letter are included in Exhibit G.

(2) Liability Insurance

Liability insurance will be maintained at all times during development, construction, and operation of the Project. Applicant has general liability and excess liability policies in place for the entirety of the development phase of the Project. During construction of the Facility, the limits of the insurance policy described will, at a minimum, insure against claims of $1,000,000 per occurrence and $2,000,000 in the aggregate. In addition, the Applicant shall acquire and maintain throughout the construction period, at its sole cost, Umbrella Coverage against claims and liability for personal injury, death, and property damage arising from the operation of the Facility. The limits of the excess liability insurance will, at a minimum, insure against claims of $10,000,000 per occurrence and $10,000,000 in the aggregate. A Certificate of Liability Insurance is provided as Exhibit H, a portion of which has been filed under seal.

(3) Construction Impacts to Roads and Bridges

A Construction Route Study and Road Condition Report was prepared by Stantec Inc. and is attached to the Application (Exhibit I). The Construction Route Study and Road Condition Report highlights strategies to limit traffic issues associated with the Project. Construction Route Study and Road Condition Report evaluates delivery and transportation routes, potential

impacts to roadways, and possible necessary mitigation measures and potential permits required due to potential impacts.

(a) Construction/Delivery Vehicles

Due to the low volume of existing traffic on the majority of highways and roads surrounding the Project Area, significant impacts to traffic during construction are not anticipated. During construction, hauling trucks, fixed bed trucks or semi-trailers, dump trucks, pickup trucks, and automobiles will all travel to the Project Area. While primarily vehicles of legal weight and size will make up construction traffic, some oversize or wide-load vehicle transportation may be required for materials at the Project. Traffic is anticipated to occur during daylight hours, with Project traffic not anticipated after 7 pm. More information about deliveries is available in the Construction Route Study and Road Condition Report in Exhibit I.

(b) Delivery Route

Delivery routes are subject to change, but Project components will likely be delivered to the Project Area by truck via County Roads 106 and 108. More information about deliveries is available in the Construction Route Study and Road Condition Report in Exhibit I.

(c) Impacts and Mitigation

Stantec conducted an analysis for the Construction Route Study and Road Condition Report in Exhibit I. According to the Construction Route Study and Road Condition Report, the

paved roads are in good to fair condition. Some areas of greater wear and cracking are noted in the photo log; however, no failing areas were observed. The county is currently investing in projects in this area to update any roads that are in fair condition. Chestnut Solar will enter into a road use maintenance agreement with the Marion County Engineer to repair damage/degradation to jurisdictional roads. A final transportation management plan, including the county-required road use maintenance agreement will be prepared and submitted to the Board prior to beginning construction. No significant structural improvements are anticipated. Should the conditions of the routes change, mitigation techniques are described in the Construction Route Study and Road Condition Report (Exhibit I).

Chestnut Solar will therefore ensure reasonable repair and maintenance of county and township roads (or portions thereof) that have been designated as defined haul routes for the Project in the event construction activities cause damage or significant degradation.

(4) Transportation Permits

For oversize or wide-load vehicle transportation that may be required, Chestnut Solar will obtain a Special Hauling Permit from ODOT.

Chestnut Solar will also coordinate with authorities to ensure proper traffic control during Project construction. For further details, see Exhibit I (Construction Route Study and Road Condition Report).

(5) Decommissioning

Utility-scale solar energy facilities typically have a life expectancy of approximately 30 years. If panels or ancillary equipment were to fail before the useful lifetime of the Facility, they would be replaced with operational components. However, if not upgraded, or if large solar arrays are non-operational for an extended period of time such that there is no expectation of their returning to operation, they will be decommissioned. The Applicant's plan for decommissioning consists of two primary components: removal of Project components/improvements for restoration of the Project site and financial assurance. Each of these is described in additional detail below as well as in the Decommissioning Plan (Exhibit J).

(a) Removal of Facility Improvements

At the end of the Project life, the Applicant will dismantle and remove Project components and aboveground property owned or installed by the Applicant, as detailed in the Decommissioning Plan (Exhibit J). At the time of decommissioning, panels may be reused, recycled, or disposed of in an approved landfill. PV panel recycling is increasingly available. Underground structures, such as buried collection lines, will be removed to a minimum depth of 36 inches. Any underground infrastructure installed to a greater depth may remain in place, unless otherwise specified in landowner agreements. The Project site will be restored, as nearly as possible, to conditions commensurate with those pre-Project. Soils will be de-compacted as necessary, and the land will be managed to accommodate pre-construction land use to the extent practicable. Upon request of the landowner, Applicant may consider allowing roads, foundations, buildings, structures, or other improvements to remain in place. Applicant will not be

obligated to leave any components or improvements and will only consider such action so long as it does not violate any permits or legal requirements.

(b) Financial Assurance

Applicant will provide financial assurances for Project decommissioning and reclamation to the State of Ohio. Prior to the start of construction, upon final engineering, the Applicant will retain an independent and registered professional engineer to calculate the Project-specific decommissioning costs for the Project and update the Decommissioning Plan (Exhibit J). Financial assurance cost estimates will be recalculated every five years over the life of the Project. This calculation will include the total cost estimate for implementing the Decommissioning Plan, accounting for any unanticipated contingencies of the Project components. Applicant will post and maintain a performance bond or similar financial assurance instrument in a form agreed to by the Board, in an amount necessary for the decommissioning of the Project. If a subsequent calculation of the decommissioning cost increases or decreases, the financial assurance instrument will be adjusted accordingly.

The Decommissioning Plan (Exhibit J) will be updated with Project-specific decommissioning costs upon final design after a Certificate is issued. The updated plan and required financial assurance will be provided to the Board prior to construction.

4906-4-07 Compliance with Air, Water, Solid Waste and Aviation Regulations

(A) Purpose

This section pertains to the current site conditions and potential impacts to air quality, water quality, solid waste and aviation regulations. The Applicant will obtain all necessary permits and authorizations and comply with applicable federal, state and local regulations.

(B) Compliance With Air Quality Regulations

(1) Preconstruction air quality and permits

(a) Ambient Air Quality

The ambient air quality within the Project area is classified by the U.S. Environmental Protection Agency (USEPA) and the Clean Air Act amendments of 1990 and is based on National Ambient Air Quality Standards (NAAQS). The NAAQS sets regulations on air pollutants that are common in outdoor air and deemed harmful to public health and the environment. The six principal or criteria pollutants are ozone (O_3), particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Areas that fall below the NAAQS are considered to be in attainment. Marion County is designated as in attainment for all criteria pollutants regulated by the USEPA (EPA 2022).

(b) Air Pollution Control Equipment

Solar PV panels operate without generating air pollutants. Therefore, no air pollution control equipment is needed.

(c) Air Quality Standards and Limitations

The USEPA established New Source Performance Standards (NSPS) to regulate the emissions of air pollutants from new stationary sources. Because solar PV panels do not emit air pollution into the atmosphere however, NSPS does not apply to the proposed Facility.

The Ohio EPA enforces Title V of the Clean Air Act and requires all new sources of air emissions in Ohio to obtain a Permit to Install (PTI) for Title V facilities, or a Permit to Install and Operate (PTIO) for non-Title V facilities. Solar PV panels do not emit air pollution into the atmosphere, so the Facility does not require either a PTI or PTIO.

(d) List of Required Air Pollution Permits

Solar PV panels generate electricity without releasing pollutants into the atmosphere. Therefore, the Project does not require air permits for construction or operation.

(e) Map of Air Monitoring Station and Air Pollution Point Sources

The proposed Facility is a renewable energy project that will not produce any air pollution. Therefore, this requirement is not applicable.

(f) Compliance with Air Permits and Standards

Solar PV panels generate electricity without releasing pollutants into the atmosphere. Therefore, the Project does not require any air permits for construction or operation.

(2) Emissions and Fugitive Dust Control During Site Clearing and Construction

Construction will occur during daylight hours over a 12 to-18-month period. The construction site will include typical heavy equipment such as semi-trucks, forklifts, tractors, bobcats and bulldozers. The use of heavy equipment is likely to generate some particulate emissions from engine exhaust and fugitive dust during construction activities. These operations will be temporary and limited to the area of construction and therefore will not have a negative impact on air quality.

The Applicant will implement Best Management Practices (BMPs) to minimize dust during construction activities. Water or other dust palliative will be used to suppress dust on unpaved roads, parking lots and exposed soils as needed. Any unanticipated construction related dust issues will be immediately reported to the construction manager.

(3) Air Quality Control During Facility Operation

The proposed Facility is a renewable energy project that will not emit any air pollution during energy production. The Facility may in fact contribute to improvements in air quality by reducing the need for non-renewable, traditional energy systems that contribute to air pollution. Any pollutants generated would be from the normal use of work vehicles and maintenance equipment. Therefore, this requirement does not apply to the proposed Project.

(C) Water Quality

A surface water delineation was conducted by Environmental Consulting & Technology, Inc. in February 2020 (Exhibit K). The survey identified all wetlands, ponds and streams within the proposed Project Area. Although the Project will not have any direct impacts, such as fills or crossings of these features, there may be some adverse impacts by erosion and sedimentation

associated with ground disturbance activities. Applicant's erosion and sedimentation control plan will mitigate any adverse impacts.

(1) Preconstruction

(a) Water Quality Permits Required to Install and Operate Facility

Prior to construction the Applicant will obtain all permits associated with water quality and construction. Potential permits identified for construction of the Project are:

- The Ohio National Pollutant Discharge Elimination System (NPDES) Construction Storm Water General Permit, Ohio EPA Permit No. OHC000005
- An Individual Permit or Nationwide Permit under Section 404 of the Clean Water Act, (if necessary, as determined after final engineering)
- A Water Quality Certification from the Ohio EPA (if necessary, as determined after final engineering)
- An Ohio Isolated Wetland Permit (if necessary, as determined after final engineering)

(b) Water Quality Map

The Facility will not discharge water or waste into streams or water bodies, nor will Facility operation require the use of water for cooling or any other activities. The Facility will add only small areas of impervious surface, primarily for the substation, gravel pads and access roads, and will have a negligible effect on surface water runoff and groundwater recharge. Therefore, measurable impacts on the quality of surrounding water resources are not anticipated. Since there are no bodies of water

likely to be affected by the proposed Facility, this section is not applicable.

(c) Water Monitoring and Gauging Stations

As described above in Section 4906-4-07(C)(1)(b), there are no bodies of water likely to be significantly affected by the proposed Facility. Therefore, this section is not applicable.

(d) Existing Water Quality of Receiving Stream

The Facility will not discharge water or waste into streams or water bodies. Therefore, there will be no receiving streams and this section is not applicable.

(e) Permit Application Data

The Facility will not discharge any water. Therefore, this section is not applicable.

(2) Construction

(a) Water Monitoring and Gauging Stations Map

As described above in Section 4906-4-07(C)(1)(b), measurable impacts on the quality of surrounding water resources are not anticipated. Since there are no bodies of water likely to be affected by the proposed Facility, this section is not applicable.

(b) Quality and Quantity of Aquatic Discharges

The proposed Facility is not expected to either generate significant runoff during precipitation events or cause adverse impacts to groundwater. The substation and access roads are the only impervious ground surfaces within the Project area, so

minimal runoff is predicted. Therefore, no significant changes to the rate, make-up, or volume of storm water runoff are anticipated.

Construction of the proposed Facility may have minor, localized effects on groundwater, however. Soil compaction from the use of construction equipment could limit the efficiency of surface water infiltration to groundwater. Compressed soil causes pore spaces within the soil to decrease, which reduces water drainage. Construction of access roads will result in compaction of soils and minor increases in storm water runoff that may otherwise have infiltrated into the ground within the road locations.

In the unlikely event of an accidental discharge, construction pollutants, such as petroleum or other chemicals, could impact groundwater. Such discharges could occur in the form of leaks from fuel and hydraulic systems, or as more substantial spills that could occur during refueling of vehicles or other accidents. A Spill Prevention and Response Plan will be prepared prior to construction to address procedures to be implemented to prevent the release of hazardous substances.

(c) Mitigation

Once operational, the proposed Facility is not expected to cause adverse impacts to groundwater or other water features. However, the mitigation measures described herein will be followed to ensure impacts to all surface waters and groundwater are avoided or minimized to the maximum extent practicable during construction.

Applicant will obtain an NPDES Construction Storm Water General Permit (OHC000005) from the Ohio EPA, as required for all construction sites disturbing 1.0 or more acres of ground. In accordance with this permit, a Stormwater Pollution Prevention Plan (SWPPP) will be designed and implemented by a qualified engineer as part of the final Project layout. Additionally, Applicant will file a Notice of Intent (NOI) with the Ohio EPA at least 21 days prior to commencement of construction.

The SWPPP will identify sources of pollution generated by construction that may impact water quality. If applicable, the SWPPP will clearly identify all activities that will be authorized under Section 401 of the Clean Water Act and be subject to an anti-degradation review. The SWPPP will also describe and ensure the implementation of best management practices that reduce pollutants in storm water discharges during construction.

On-site investigations of wetland and waterbody delineations were conducted to establish the locations of streams and wetlands. The Facility components were sited to avoid impacts to these resources to the maximum extent practicable. Impacts to surface waters have been minimized through the use of overhead collection lines and feature avoidance. Equipment restrictions, herbicide use restrictions, and erosion and sediment control measures will also be utilized to reduce adverse impacts to water quality, surface water hydrology, and aquatic organisms. In addition, vegetation clearing along stream banks

and in wetland areas will be kept to a minimum. For further explanation of mitigation measures to protect wetlands and surface waters, see Section 4906-4-08(B)(2)(b).

(d) Changes in Flow Patterns and Erosion

As a result of the limited impacts discussed in Section 4906-4-07(C)(2)(b) and the mitigation measures discussed above in Section 4906-4-07(C)(2)(c), changes to flow patterns are not anticipated.

(e) Equipment for Control of Effluents

Facility operation will not involve the discharge of effluents into streams or water bodies. Therefore, there is no equipment needed for control of effluent discharge and this requirement is not applicable.

(3) Facility Operation

(a) Water Quality Map

As described above in Section 4906-4-07(C)(1)(b), measurable impacts on the quality of surrounding water resources are not anticipated. Since there are no bodies of water likely to be affected by the proposed Facility, this section is not applicable.

(b) Water Pollution Control Equipment and Treatment Processes planned

The Facility will not require any water pollution control equipment or treatment processes. Therefore, this section is not applicable.

(c) National Pollution Discharge Elimination System Permit Schedule

As mentioned above, Facility construction will require an Ohio NPDES Construction Storm Water General Permit, Ohio EPA Permit No. OHC000005. The Applicant will coordinate with the Ohio EPA for this permit prior to construction, likely in January or February of 2025. The Notice of Intent (NOI) and associated fee for the Construction Activities General Permit (with which Chestnut Solar will fully comply) will be filed at least 21 days prior to commencement of construction activities.

(d) Quantitative Flow Diagram

As explained in the following sub-sections, flow diagram information is not applicable to the proposed Facility.

(i) Sewage

The proposed Facility will not generate any sewage.

(ii) Blow-down

PV Panels do not utilize blow-down equipment. Therefore, this section is not applicable.

(iii) Chemical and additive processing

The proposed Facility will not require the use of chemical and/or additive processing. Therefore, this section is not applicable.

(iv) Wastewater processing

The proposed Facility will not generate wastewater. Therefore, this section is not applicable.

(v) Run-off and leachates from fuels and solid wastes

The Facility is not expected to generate any run-off or leachates. Therefore, this section is not applicable.

(vi) Oil/water separators

This section is not applicable because the Facility will not utilize any oil/water separators.

(vii) Run-off from soil and other surfaces

Following completion of construction, temporarily impacted areas will be stabilized and restored to their preconstruction condition. Facility operation will not result in further soil disturbance, unless necessitated by repair activities, which Applicant anticipates will be infrequent. Therefore, this section is not applicable.

(e) Water Conservation Practices

Aside from the very limited quantities of water that may be used for the occasional cleaning of solar panels, no on-site Facility components requiring water sources, such as an office space, are planned for the Facility. The O&M container(s) will utilize non-permanent water and wastewater services from an operator licensed to provide those services. Therefore, water conservation practices are not applicable.

(D) Solid Waste

(1) Preconstruction

(a) Nature and Amount of Debris and Solid Waste

Applicant has not identified any solid waste or debris within the Project area that requires removal for construction of the Facility.

(b) Waste Removal Plans

No preconstruction debris or solid waste removal has been deemed necessary.

(2) Construction

(a) Nature and Amount of Debris and Solid Waste

Construction of the Facility will generate minimal debris and solid waste, such as wood, plastic, metal and cardboard packing materials and construction scrap.

(b) Waste Storage and Disposal

Construction waste will be disposed of in dumpsters located at the laydown yard. A private contractor will empty the dumpsters as needed and dispose of the refuse at licensed solid waste disposal facilities. Any used oils and universal waste will be handled and disposed of in accordance with federal, state and local regulations.

(3) Operation

(a) Nature and Amount of Debris and Solid Waste

Facility operation is not expected to generate a significant amount of debris or solid waste. Incidental waste from the O&M container(s), such as paper, cardboard, metal, and general garbage, will be disposed of in a dumpster.

(b) Waste Storage and Disposal

Storage and disposal of any incidental waste will be in compliance with local, state, and federal regulations.

(4) Licenses and Permits

The Facility operation will not require any waste generation, storage, treatment, transportation or disposal permits.

(E) Compliance With Aviation Regulations

(1) Aviation Facilities List and Map

There are two airports within 5 miles of the project: the Marion Municipal Airport located about 5 miles north of the Project and the Soltis Field private use airport located about 0.5 miles west of the Project (Figure 8-7). Notification to the Marion Municipal Airport of the Proposed Facility was completed on October 25, 2022, and to Soltis Field Airport on November 17, 2022. The notifications are included in Exhibit L – Airport Notification.

(2) FAA Filing Status and Potential Conflicts

The Federal Aviation Administration (FAA) has conducted an aeronautical study of the solar panels under the provisions of 49 U.S.C. § 44718 and determined that the structure does not exceed obstruction standards and would not be a hazard to air navigation (Exhibit M). A glare analysis study (Exhibit N) was prepared to evaluate any potential impacts from the Project on FAA regulated airports, residents and roads in the vicinity of the Project. Results from the glare analysis indicate that no glint or glare would be received at any of the identified residences, airports, or travel routes.

4906-4-08 Health and Safety, Land Use, and Ecological Information

(A) Health and Safety

(1) Equipment Safety and Reliability

(a) Major Public Safety Equipment

To prevent unauthorized access to the Project Area, Chestnut Solar will implement safety measures during construction and operation. During construction, highly visible fencing and signage will be placed around the staging and storage areas. Temporary fencing will be supplemented by signs cautioning the public of potential dangers and listing 24-hour emergency numbers, operator contact information, and instructions for emergency personnel. Temporary construction lighting will be needed at night to provide security. Area lighting may be provided around equipment, material laydown areas, and temporary construction facilities such as trailers. Motion-activated flood or spot lighting may also be used in those instances. The construction site will be properly secured during the night and non-working hours.

During operation, the Facility will be secured by a wildlife-permeable perimeter fence, controlled access gates, electronic security systems, and potentially remote monitoring. Highly visible signage will be utilized at the Facility during operation, along with perimeter fencing and ingress/egress area lighting. Permanent lighting during Project operations will be as necessary for safety and site security. Entrance areas of the Project will have downlit, motion activated security lighting.

Chestnut Solar will ensure that lighting does not create any material adverse effect on adjacent properties. The Lighting Plan included as Appendix B in the Landscape Plan outlines the necessary measures to be taken for safe passage around boundaries of the Facility (Exhibit C). Access to the Facility will be restricted to authorized persons during both construction and operation.

(b) Reliability of Equipment

The Applicant will only select reliable, certified equipment for all Facility components. These components include, but are not limited to, PV Modules, inverters, racking systems, wiring and transformers. All equipment will have standard industry safety and reliability certifications (e.g. Conformité Européenne (CE), Underwriters Laboratories Inc. (UL), Institute of Electrical and Electronics Engineers (IEEE)).

(c) Generation Equipment Manufacturer's Safety Standards and Setbacks

The specifications for representative generation equipment such as modules, inverters, and trackers for the Project are provided in Exhibit B. Setbacks are not included in the manuals but those to which Applicant will adhere are discussed in Section 4906-4-08(C)(2) of this application. The manufacturers' safety standards will be provided after the final selection of PV solar module technology for the Project has been selected. All Project equipment will be compliant with applicable ANSI, IEEE, NEC, and NESC codes and regulations and best engineering practices. Any and all safety and setback requirements outlined in the manufacturer's product manuals and specifications for the

equipment selected for the Project will be incorporated into the final design.

(d) Measures to Restrict Public Access to the Facility

The Applicant will install secured fencing and controlled access gates to restrict public access to the Facility. The fence will be a 6-foot (1.8-meter) small-wildlife-permeable fence which meets the requirements of NEC as well as a chain link fence around the substation. Because the Facility will be located on private lands, unauthorized access by a member of the public could only be gained by trespassing. Highly visible "No Trespassing" and "High Voltage" signs will be placed along the Facility perimeter to warn the public (and any would-be trespassers) of the potential hazards within the fenced Project Area.

(e) Fire Protection, Safety, and Medical Emergency Plans

A site-specific Health and Safety Plan (HASP) will be developed by the Applicant prior to construction and utilized during construction. All site personnel, on-site contractors and subcontractors shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards associated with the operations. The Emergency Action Plan (EAP) enclosed within the HASP details actions to be taken in the event of an emergency. The EAP details emergency personnel, entry and exits of the site and maps of safety equipment such as fire extinguishers and spill kits. Equipment safety standards will also be included in the HASP.

During construction, site safety personnel will coordinate with EMS & Fire Departments to identify evacuation locations (muster points) for emergency calls and any E-911 address discrepancies. If requested/desired by the Project area's jurisdictional EMS and Fire Departments, Applicant will host a site visit for emergency personnel to share entry and exit paths, lock box codes and general Q&A once the Project is constructed and prior to the Facility in-service date.

(2) Probable Impacts Due to Failures of Air Pollution Control Equipment

Solar panels generate electricity without combusting fuel or releasing any pollutants into the atmosphere during operations. Therefore, this section is not applicable.

(3) Noise

A field survey of the existing ambient sound levels within the Project Area was performed in May 2022 to quantify the baseline environmental conditions. Five monitoring stations located throughout the Project Area recorded continuously day and night for seven days. Despite the fact that different types of settings were represented (e.g., open fields, wooded areas, areas close to roads, areas far from roads, etc.,) the sound levels were very similar at all positions, indicating that the average measured level at any given location is reasonably representative of the entire Project Area. The average (Leq) daytime and nighttime levels were 54.8 and 53.8 A-weighted decibels (dBA), respectively. Ambient sound in the area was highly influenced by active farm equipment and traffic on US Highway 23. Maximum total sound, with ambient considerations, is not expected to exceed 55.1 dBA at any identified noise receptor. The loudest feature of this Project is the Facility substation. Modeled daytime sound levels due to Facility operation at the nearest homes to the substation were calculated to be approximately 44.0 dBA. Therefore,

sound levels at homes are predicted to be less than Applicant's design target of 59.8 dBA (including ambient sound). Nighttime sound levels were not modeled because as solar projects only operate during daylight hours, with equipment shifting to stand-by mode at both the inverter and substation locations. Neither is reactive power generated at night. Therefore, at nearby residences, nighttime sound is expected to be the same as the ambient sound level. The Pre-Construction Sound Report and Predictive Operational Sound Assessment is included as Exhibit O.

(a) Construction Noise Levels Expected at the Nearest Property Boundary

Construction noise sources include installation of mounting posts for panel racks and the substation (concrete pump trucks and servicing mixers), some trenching, and road building. Chestnut Solar does not anticipate any blasting activities.

In general, it is very difficult to quantify or evaluate construction noise in a meaningful way because the noise itself is highly variable with time as individual pieces of equipment start and stop and operate in different parts of the roughly two-mile-long (north-to-south) Project Area. Table 8-1 provides representative sound levels from construction equipment associated with the different phases of construction relevant to the Project. The table includes a range of typical equipment expected for construction of the Project but does not include specialized equipment which may be used for short periods of time in isolated locations, such as Horizontal Directional Drilling (HDD) equipment. The Applicant anticipates that the sound levels associated with the HDD equipment will be within the range of sound levels provided for other equipment in Table 8-1. Sound levels are

given at the standard test distances of 50 feet, 300 feet, and 1,000 feet, which are representative for sound dissipation. The Roadway Construction Noise Model (RCNM) is the Federal Highway Administration's national model for predicting construction noise. The RCNM is largely based on EPA methods from the 1970s in which equipment noise emissions, expressed as L_{max} levels at a reference distance of 50 feet, are then adjusted for the actual distance to the receptor as well as for the time (or usage factor) that the equipment is predicted to produce noise on the job site (FHWA, 2006). The 300-foot distance generally represents the nearest approach of any construction activity to neighboring homes and quantifies the highest sound level that might occur from construction near the edges of the Project Area. The 1,000-foot distance gives the sound levels that are more representative of what might be heard in the less densely populated areas of the Project Area.

In comparison to sound emitted during the construction of other types of power generation facilities, sound emissions during the construction of solar energy projects are expected to be dramatically lower in magnitude and in duration. Some unavoidable disturbance is likely when the mounting posts are driven in, but this activity will be intermittent and short-lived in any particular location. Other sounds from trenching and road building will also be brief in duration and will progress from place to place, avoiding prolonged exposure at any specific location. Sound levels from construction equipment at the nearest non-participating property boundaries should not exceed 90 dBA at 50 feet. The Facility has been set back a

minimum of 100 feet from property boundaries, which will minimize noise levels for non-participating properties.

Equipment	Typical Noise Levels Approximately 50 Feet from Source (dBA)	Typical Noise Levels Approximately 300 Feet from Source (dBA)	Typical Noise Levels Approximately 1,000 Feet from Source (dBA)
Bulldozer	**85**	**69**	**59**
Haul Truck	**84**	**68**	**58**
Mounted Impact Driver	**90**	**74**	**64**
Backhoe	**80**	**65**	**54**

[3] **Table 8-1. Typical Solar Facility Construction Equipment Noise Levels**

(b) Operational Noise Levels Expected at the Nearest Property Boundary

(i) Operational noise from generation equipment

Sound power levels at various Facility components are specified in Exhibit O. The maximum expected daytime sound level due to Project operation at any residence in the general Project Area is approximately 44.0 dBA, but for most of the residences, the modeled sound level is lower than 40.0 dBA. These sound levels are generally lower than the existing ambient sound level, suggesting that any sound emissions from the Project inverters are likely to be inaudible. Near the substation, a Project sound level of approximately 44.0 dBA is calculated at the two nearest residences. The estimated expected sound level at these residences including both Project operational sound and daytime ambient sound is 55.1 dBA. This is 4.7 dBA below the ambient + five dBA daytime design goal of 59.8 dBA and is a sound level that essentially represents

[3] FHWA Highway Construction Handbook – Construction Equipment Noise Level Ranges.

the point where the sound from any project becomes so low that it goes unnoticed, even in areas with extremely low background levels. Results from sound modeling at each receptor are included in the Pre-Construction Sound Report and Predictive Operational Sound Assessment (Exhibit O).

(ii) Processing equipment

The Project does not include processing equipment. Therefore, the requirement under OAC 4906-4-08(A)(3)(b)(ii) is not applicable to the Project.

(iii) Associated road traffic

Due to the rural location of the Project, road traffic volume is low. Information about noise produced from construction equipment/vehicles is provided in Table 8-1 above.

(c) Location of Noise-Sensitive Areas Within One-Mile of Facility

Figure 8-1 depicts sensitive receptors within the project vicinity. Note that this figure only shows noise-sensitive areas within 1,000 feet because no sound generated by the facility will be audible beyond that perimeter. See Figure 2 of Exhibit O, (Preconstruction Sound Report) for further details regarding operational noise levels at sensitive receptors.

(d) Mitigation of Noise Emissions During Construction and Operation

Construction and operation will take place during daylight hours. Further, Applicant will follow BMPs for sound abatement during construction and provide notice of construction activity to affected property owners. In general, the potential noise impacts from all aspects of the Project are expected to be minimal.

(e) Preconstruction Background Noise Study

Ambient sound measurements were taken at five noise monitoring locations across the Project area. These locations were selected due to their proximity to the proposed substation and/or the proposed solar arrays and inverters. Locations of microphones can be found in Figure 1 of the Preconstruction Sound Report (Exhibit O).

A Larson Davis SoundAdvisor 831C Sound Level Meter (SLM) equipped with a PCB Piezotronics Type 1 preamplifier, microphone, and environmental protection kit was used to measure the octave band and broadband ambient sound pressure levels in the selected locations. The microphones were mounted on tripods approximately five feet off the ground and were equipped with windscreens. The SLM logged data every 10 minutes along with one second time history. This data was then processed to identify and filter anomalous noise events caused by weather.

Sound results were calculated using the Cadna-A Acoustical Modelling software by Datakustik, which utilizes conservative ISO 9613-24 algorithms to estimate sound propagation and atmospheric absorption. The parameters and assumptions made in developing the estimates are as follows:

- All inverters, transformers and the substation transformer were considered as operating simultaneously within the analysis.
- An inverter/transformer sound power level of 97.7 dBA

was used.

- A substation transformer sound power level of 96.3 dBA was used.
- A ground attenuation factor of 0.5 (on a scale of 0.0 representing hard ground to 1.0 representing porous ground) was used.
- Meteorological conditions used were conducive to sound propagation (10 degrees Celsius and 70 percent relative humidity).

The overall average sound levels during the day and night are tabulated below along with an industry-standard design standard for solar-powered generation facilities (Leq [NS:A-weighted] plus 5 dBA) (Table 8-2). The nearest noise sensitive area is a non-participating residence (R-169) north of County Road 150.

Maximum Operational Expected Sound (dBA)	Distance from R-169 to Nearest Inverter (feet)	Average Ambient Daytime L_{eq} Sound (dBA)	Average Ambient Nighttime L_{eq} Sound (dBA)	Maximum Expected Total Sound (dBA)	Maximum Allowable Total Sound (dBA)
43.5 (R-169)	510	54.8	53.8	55.1	59.8

Table 8-2. Chestnut Solar Expected Sound Levels at Nearest Noise Sensitive Area

(4) Water Impacts

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

Groundwater well information for the Project Area and surrounding vicinity was obtained from the Ohio Department of Natural Resources (ODNR). Numerous residential and

assumed agricultural groundwater wells exist within and near the project limits. Figure 8-2 displays wells in the vicinity of the Project Area. Three wells are identified within the Project limits, one near the northern edge of the project, and two near the center. The remaining water wells identified exist around the perimeter of the project, mainly near roadways. Groundwater well details are included in the Ecological Assessment (Exhibit P).

Chestnut Solar will coordinate directly with participating landowners as well as use databases to locate specific wells and identify avoidance and mitigation measures. ECT conducted a well survey as part of the Phase I Environmental Site Assessment (Exhibit BB) conducted in March 2020 and observed no wells on the property at the time of the site visit. ECT also noted that currently, potable water is not supplied at the subject property.

As shown in A5 and A6 of Exhibit Q Groundwater Hydrogeology and Geotechnical Report, the principal source of groundwater for the majority of the Project area is from an unconsolidated, Waldo Ground Moraine Aquifer (25-100 feet deep) over a consolidated aquifer (over 100 feet deep). No Source Water Protection Areas (SWPAs) are located in the Project Area or within the immediate watershed of the Project Area, the Upper Scioto (Hydrologic Unit Code [HUC] 05060001). The nearest downstream Groundwater Protection Area is located approximately 1.2 miles southeast of the Project Area. Shallow excavation required for the Project (i.e., 3-4-foot-deep trenches for buried underground cables) and pile driving depths

of up to 10 feet below grade are not expected to impact any public or private wells or associated water supplies. Any wells located within the vicinity of piling location will be decommissioned per state guidelines prior to construction. Details on those protection areas for surface water and groundwater are provided below in Section 4906-4-08(A)(4)(d).

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

Solar PV arrays do not combust fuel or release pollutants into the atmosphere during operations, so this section does not apply.

(c) Water Resources Map

Figure 8-2 illustrates the aquifers, drinking water source protection areas, wells in the Project Area. The unconsolidated Waldo Ground Moraine Aquifer, Galion Ground Moraine Aquifer and Galion Thin Upland Aquifer underlie the Project area. The Waldo Thin Upland Aquifer is also located within the immediate vicinity of the Project Area. There are numerous residential and assumed agricultural groundwater wells within and near the project limits. There are three wells identified within the project limits, one near the northern edge of the project, and two near the center. The remaining water wells identified exist around the perimeter of the Project, mainly near the roadways. There are no OEPA SWPAs in the Project area and therefore none are mapped in Figure 8-2.

(d) Compliance with Local Water Source Protection Plans

This section is not applicable. No SWPAs were identified in the vicinity of the Project Area by the OEPA. The nearest downstream Groundwater Protection Area is located approximately 1.2 miles southeast of the Project Area. Solar PV modules do not combust fuel or release pollutants into the atmosphere or ground during operations.

(e) Prospects of Floods

Floods are unlikely. Surface waters within the Project vicinity flow west into the offsite Qua Qua Creek. No 100-year Federal Emergency Management Agency (FEMA) mapped floodplain areas are located within the Project Area (Figure 8-4). The 100-year floodplains are identified in Figure A-8 of Appendix A to Exhibit P. The final Project layout will use avoidance and design in order to mitigate any possible hydrologic concerns.

(5) Geological Features Map

Topographic contours, bedrock formations, and the Project Area are included in Figure 8-3 of this Application. There are no oil and gas wells or injection wells in the Project vicinity. Additional details regarding geologic features are included in the Groundwater, Hydrogeology, and Geotechnical Report (Exhibit Q) and the Ecological Assessment (Exhibit P).

(a) Geologic Suitability

The Project Area is located in a region of surficial clayey till with well-defined moraines, intervening flat-lying ground moraine, and intermorainal lake basins (Groundwater, Hydrogeology, and Geotechnical Report, Exhibit Q). Relief across the central

Ohio region is moderate and ranges from 700 feet Above Mean Sea Level (AMSL) to 1,150 feet AMSL. Groundwater was encountered during drilling activities in borings drilled on this Project. Depth to groundwater is 3.5 feet to 4.8 feet below existing ground surface. The Ohio Karst Areas (ODNR, 2006) map indicates no probable karst areas exist within the project vicinity. The nearest identified karst features are south of the project in Delaware County.

A review of the seismic data available in the Project vicinity included the Earthquake Epicenters Interactive Map developed by the Ohio Department of Natural Resources, Division of Geological Survey (ODNR-DGS). Overall, Ohio has a relatively limited amount of seismic activity. However, the Project site is within 25 miles of two earthquake epicenters, with magnitudes within a range of 3.1 to 3.8, occurring between 1873 and 1930. The mapping showing the identified events and the 25-mile radius used to establish the noted epicenters is presented in Appendix A. The available data reviewed included events that occurred between 1836 and 2022.

The Project Area is Devonian Group bedrock mapped as sedimentary rocks, primarily limestone and dolomite with some shale and minor sandstone. Bedrock was encountered during drilling activities. Depth to bedrock ranged from 19.2 feet to 22.6 feet.

(b) Soil Suitability

(i) Existing Conditions

Published soils information for Marion County, obtained from the USDA – Natural Resources Conservation Service website identified two primary and numerous minor natural soils units mapped within the Project area (USDA-NRCS, 2022). Soils in the Project area are primarily Blount silt loams and Pewamo silty clay loams. The two soil types accounted for a combined 90.7 percent of the Project Area. Blount silt loams are described as being somewhat poorly drained and have high runoff potential. Pewamo silty clay loam is described as being very poorly drained and has negligible runoff potential (Groundwater, Hydrogeology, and Geotechnical Report, Exhibit Q). Based on a review of the NRCS Web Soil Survey, the Project Area soils were not classified as highly erodible soils; most had Wind Erodibility Group ratings of 5 (0 being highly erodible; 8 being least erodible). Test borings encountered conditions consistent with the USDA County Soil Survey and topsoil was encountered in both borings with a thickness of 1.0 and 0.8 feet in Borings B-101 and B-102, respectively.

(ii) Site Suitability

The soils in the Project Area are suitable for the development of a solar energy generation project, based on the findings of the Groundwater, Hydrogeology, and Geotechnical Report (Exhibit Q). These soils typically classify as CL (Lean Clay) or CL-ML (Silty Clay) using the Unified Soils Classification System (USCS) method. Minimal grading (i.e., less than +/- 2 feet) is expected due to the existing flat topography of the

agricultural fields where the PV panels are proposed. The on-site soil material appears to be generally suitable for re-use as fill or back-fill.

Groundwater was observed at 3.5 feet to 4.8 feet below existing ground surface. Due to the low permeability of the soils encountered, the possibility of groundwater level fluctuations will be considered when developing the design and construction plans for the Project.

(c) Test Borings

A preliminary geotechnical investigation has been conducted and is included in the Groundwater, Hydrogeology, and Geotechnical Report (Exhibit Q), which includes details regarding two bore locations, one of which (B-102) was conducted within approximately 1,000 feet of the proposed Project substation location. The report also includes a summary of site properties and recommendations for construction practices based on the geological and soil conditions present in the Project Area.

The borings were proposed to be advanced to a depth of 25 feet, or to the top of bedrock, whichever was encountered first. The borings were advanced with a truck-mounted drill rig equipped with 4.25-inch inner diameter hollow stem augers (HSA). Standard penetration tests (SPTs) were performed at continuous intervals for the first 10 feet, then every five feet after that until termination depth was reached. In addition, bulk bag samples were collected from auger cuttings at selected intervals for additional laboratory testing.

The borings were logged in the field by a Stantec engineer observing the auger cuttings and recovered soil samples while paying particular attention to soil type, color, moisture content, and strength consistency. Borings were checked for the presence of groundwater during drilling operations. Upon completion of drilling, temporary piezometers were installed with 5-foot slotted screen sections packed in sand and backfilled with a mixture of auger cuttings with bentonite chips.

All samples obtained were transported to the soils laboratory where natural moisture content (MC) was measured. Engineering classification testing was performed on select SPT samples reflecting the primary soil horizons. The engineering classification tests conducted on the samples included sieve and hydrometer analysis and Atterberg Limits. The samples were classified in accordance with the USCS Classification System. Selected bulk bag samples were subjected to Standard Proctor testing along with Thermal Resistivity and Corrosivity testing. The laboratory testing was performed in accordance with American Society for Testing and Materials (ASTM) standards.

In preparation of the final site design (likely late 2023 to early 2024), up to eight additional test borings will be drilled using SPT procedures (ASTM D-1586) at selected intervals to evaluate the consistency and density of the subsurface soils at the final location of the Facility substation and solar arrays.[4] The

[4] Applicant has requested a partial waiver to allow deferred submission of plans for additional borings.

substation area will be drilled to a depth of up to 20 feet while the solar panels area will be drilled to a depth of up to 15 feet. Field electrical resistivity testing will be performed at certain locations. Samples will be collected for laboratory testing. Water observations in the boreholes will be recorded during and at the completion of drilling. A truck-mounted drill rig will be used to perform the borings. Borehole abandonment and filling will comply with state and local regulations. A report will be prepared documenting the findings of the borings and laboratory testing, will be completed and provided to the Board prior to construction.

(6) Wind velocity

The Facility will be engineered and installed to withstand typical high-wind occurrences. The Facility design factors in wind speeds, which are based on building codes and wind speed maps. The American Society of Civil Engineers (ASCE) 7 Hazards Report denotes that the Project is not located in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2 and is designed to withstand 100 mph winds in a 3-second gust with structures of 33 feet above ground for Exposure C Category (ASCE 2023).

Data provided in Table 8-3 indicates that 64 percent of daily average wind speeds measurements were most observed between the 4.1 to 10 miles per hour range. According to the Beaufort Wind Force Scale, wind effects between 7 to 10 miles per hour are generally described as gentle breezes in which leaves, and small twigs are in constant motion and light flags are extended (Mets Matters, 2023). The average daily wind speed for Marion County is 10.21 mph (Weatherspark.com, 2023).

Average Daily Wind Speed (mph)	Number of Days	Percent of Total Days
0 - 2	2.29	0.63%
2.1 - 4	26.63	7.29%
4.1 - 6	83.75	22.95%
6.1 - 8	82.25	22.53%
8.1 - 10	67.83	18.58%
10.1 - 12	44.92	12.31%
12.1 -14	29.25	8.01%
14.1 - 16	16.08	4.41%
16.1 - 18	7.83	2.15%
18.1 -20	0.00	0.00%
20.1 -22	2.29	0.63%
22.1 - 24	1.00	0.27%
24.1 -26	0.50	0.14%
26.1 -28	0.38	0.10%
Total	**365**	**100%**

[5]Table 8-3. Daily Average Wind Speeds in the Project Area

A NEXTracker, Array Technologies, or similar racking system will monitor wind speeds during operation. The single axis racking system will shift into a stow position when wind speeds exceed 35 mph for 3 seconds. In addition, the Facility will include up to four met stations with pyranometers, and other equipment designed to measure solar irradiance and other related weather conditions. These pyranometers will be mounted to the PV racking systems and located in conjunction with other meteorological measuring equipment such as temperature sensors, soiling stations, anemometers, and albedometers, and will be approximately 4 to 10 feet in height.

(7) Blade Shear

Given the nature of the Facility, this section is not applicable.

[5] SolarAnywhere by Clean Power Research

(8) Ice Throw

Given the nature of the Facility, this section is not applicable.

(9) Shadow Flicker

Given the nature of the Facility, this section is not applicable.

(10) Radio and Television Reception

Solar PV arrays generate weak electromagnetic fields (EMFs) during the day that dissipate at short distances. The maximum height of solar modules will be 15 feet (4.6 meters). The applicant does not anticipate interference with radio or television reception due to weak electric fields produced by the proposed solar facility.

(11) Radar interference

Solar PV arrays generate weak electromagnetic fields (EMFs) during the day that dissipate at short distances. The maximum height of solar panels will be approximately 15 feet (4.6 meters) tall. According to the FAA, PV systems represent little risk of interfering with radar transmission due to their low profile (Lawrence and Magnotta, 2018). As a result, the Facility is not anticipated to interfere with military or civilian radar communication systems.

(12) Navigable airspace interference

There are two commercial airports within 10 miles of the project: the Marion Municipal Airport located just less than 5 miles north of the Project and Packer Airport located about 10 miles southwest of the Project. Soltis Field, a private airport, is located about 0.6 miles west of the Project. A glare analysis study (Exhibit N) was prepared to evaluate any potential impacts from the Project on FAA-regulated airports, residents and roads in the vicinity of the Project. Results from the glare analysis indicate that no glint or glare would be received at any of the identified residences, airports, or travel routes.

Due to the low profile of the Facility, impacts to navigable airspace are not anticipated (the tallest structure will be the overhead collection line support structures)). See Section 4906-4-07(E) for a discussion of potential aviation impacts from glare, which are not anticipated to occur as a result of the Project.

(13) Communication interference

The maximum height of components of this Facility will be the collection lines. Interference with any microwave communication paths or systems is not predicted because the Project will not include tall structures and will only generate very weak EMFs that dissipate quickly over short distances.

(B) Ecological Resources Impact

(1) Ecological information

In support of this Application, Environmental Consulting & Technology, Inc. completed on-site ecological surveys during the wetland delineation and prepared a Vegetation and Habitat Assessment regarding results of field studies in the Project area (Exhibit AA). Stantec prepared an Ecological Assessment Report (Exhibit P).

(a) Ecological Resources Map

Figure 8-4 shows the proposed Project and the ecological features within 0.5 mile of the Project Area. This figure utilizes publicly available data from the Natural Resources Conservation Service (NRCS), the National Audubon Society and the Ohio Department of Natural Resources (ODNR). It also shows the results of an on-site surface water delineation survey. Figure 8-4 includes the following features:

(i) The proposed facility and project area boundary

Figure 8-4 also depicts the Project area boundary and the proposed Project layout ("Project Layout Area").

(ii) Undeveloped or abandoned land such as wood lots or vacant tracts of land subject to past or present surface mining activities, not used as a registered game preserve or in agricultural production

Undeveloped land in the Project Layout Area is made up of deciduous forest and grassland/herbaceous land. Of the 549.1 acres that make up the Project Layout Area, approximately three acres are deciduous forest (Table 8-4). Undeveloped land data was derived from the U.S. Geological Survey National Land Cover Database (NLCD 2021). No areas of past or present surface mining were present in the Project Area.

Land Cover Type	Acres	Percentage
Cultivated Crops	529.7	96.5
Developed, Open Space	11.6	2.1
Developed, Low Intensity	4.0	0.7
Developed, Medium Intensity	0.7	0.1
Deciduous Forest	3.0	0.5
Grassland/Herbaceous	<0.1	<0.1
Total Acreage	**549.1**	**100%**
Source: NLCD 2021		

Table 8-4. Existing Land Use within Project Area

(iii) Wildlife areas, nature preserves, and other conservation areas

The Natural Heritage Program has confirmed that there are no wildlife areas within a one-mile radius of the Project Area.

Wildlife areas and other conservation areas are shown in Figure 8-4.

(iv) Surface bodies of water, including wetlands, ditches, streams, lakes, reservoirs, and ponds

One wetland, two streams, and one pond were identified within the Project Area. Waterbodies are depicted in Figure 8-4. More information regarding surface bodies of water may be found in the Ecological Assessment (Exhibit P).

(v) Highly erodible soils and slopes of twelve percent or greater

The Project Area is primarily flat agricultural land lacking steep slopes and highly erodible soils. Figure A-2 of the Ecological Assessment (Exhibit P) depicts the soil units and their corresponding descriptions. Topographic data illustrating altitude, slopes, and bedrock geology are depicted in Figures 1.2 and A-3 in Appendix A of the Ecological Assessment (Exhibit P).

(b) Field Survey and Map of Vegetative Communities and Surface Waters Within 100 Feet of Construction

(i) Vegetative Communities

The Ecological Assessment (Exhibit P) analyzed the vegetative communities within the Project Area using aerial photos, National Land Cover Databases, and subsequent field surveys. Primary vegetative communities are agricultural land, with small areas of developed land, and clusters of deciduous forest. All the major vegetative communities are common in Ohio. Corn, soybean, and winter wheat crops make up the majority of the Project Area.

Maps of vegetative communities can be found in Figure A-1 of Appendix A in the Ecological Assessment Report (Exhibit P).

Environmental Consulting & Technology (ECT) completed a site visit in February 2020 to assess the vegetation and habitat within the Project vicinity. Results of this assessment are included in Exhibit AA. ECT confirmed the presence of the vegetation communities depicted on the aerial imagery during the on-site visit, including mainly agricultural fields with some forested habitat and pasture along the perimeter of the Site. Applicant does not anticipate clearing trees or impacting any forested habitat or the small area of pasture based on the current site design.

(ii) Wetland and Stream Delineations

ECT conducted surface water delineations within the Project area. A Wetland Delineation Report is provided as Exhibit K. The study area for the delineation spanned the full leased boundary of just over 550 acres. The Facility Footprint is a smaller subset of this space, covering approximately 404 acres.

One wetland, two streams, and one pond were identified within the Project Area. The total acreage of wetland within the Project Area is 0.7 acre. The final jurisdictional determination of the wetlands and waters in the Project Area is attached in Appendix E of the Wetland and Waterbody Delineation Report (Exhibit K). Based on the Project layout, no wetlands and no surface waters will be temporarily or permanently impacted. Detailed information on the

delineated wetlands and streams are mapped in the Wetland Delineation Report (Exhibit K).

(c) Literature Review of Plant and Animal Life Within One-Fourth Mile of Project Area

This section provides the results of a literature survey of the plant and animal life within at least 0.25 mile of the Project Area boundary. The literature survey is divided into two sections: (i) plants and (ii) animals.

(i) Plants

The review of plant resources within 0.25 mile of the Project Area boundary focuses on species of commercial or recreational value and species designated as endangered or threatened. This information was compiled through the review and analysis of existing data from the ODNR. Aside from crops, there are no known plant species of commercial or recreational value within 0.25 mile of the Project Area. Consultation with the ODNR did not identify any state-listed protected species likely to occur in the Project area. Even so, Facility components will be sited within actively cultivated fields that do not provide appropriate habitat conditions for state-listed plant species that occur in uplands.

(ii) Animals

Stantec conducted the following activities to determine the federally and state-listed species of interest that could occur within the Project Area, including utilization of the USFWS IPaC and reviewing the ODNR Natural Heritage Program's correspondence. More information and a comprehensive

table of the state and federally listed species potentially occurring in the Project Area is available in the Ecological Assessment (Exhibit P, Section 4.4 and Table 4.3). Correspondence relating to Applicant's threatened and endangered (T/E) species agency consultation is included in Exhibit X.

Federally Listed Species

There is no significant habitat for federally listed bat species in the Project Area. Consultation with the ODNR and USFWS identified the Indiana bat (Myotis sodalis) and the northern long-eared bat (Myotis septentrionalis) as having the potential to occur in the Project Area. The relatively small, low-quality forested areas which occur in and around the Project Area are unlikely to provide permanent, suitable habitat for sensitive bat species such as the Indiana bat and northern long-eared bat. Individuals of these species will likely opt for higher-quality wooded areas. Chestnut Solar does not anticipate clearing any trees for construction or operation of the Project. If any tree clearing is required, Chestnut Solar will adhere to the ODNR and USFWS tree clearing recommendations of October 1 to March 31.

State-Listed Species

The ODNR Division of Wildlife lists state wildlife and plant species by County. State-listed protected species for Marion County include the upland sandpiper (bird, Bartaramia longicauda), American bittern (bird, Botaurus lentiginosus), northern harrier (bird, Circus hudsonius), king rail (bird, Rallus elegans), snuffbox (mollusk, Epioblasma triquetra), clubshell (mollusk, Pleurobema clava), Ohio pigtoe

(mollusk, Pleurobema cordatum), rabbitsfoot (mollusk, Theliderma cylindrica), rayed bean (mollusk, Villosa fabalis), trumpeter swan (bird, Cygnus buccinator), sandhill crane (bird, Grus canadensis), least bittern (bird, Ixobrychus exilis), black-crowned night-heron (bird, Nycticorax nycticorax), and Pondhorn (mollusk, Unionmerus tetralasmus) (ODNR, 2022).

None of these species, nor their critical habitats, are known to occur within the Project Area. There are no anticipated impacts to these species.

(d) Results of Field Surveys for Plant and Animal Species Identified in Literature Review

ECT completed a site visit in February 2020 to assess the vegetation and habitat within the Project vicinity. Results of this assessment are included in Exhibit AA. ECT determined the habitat potential for each of the Federally listed species above to be low to very low, largely because the Facility will be located in agricultural fields, which lack suitable habitat for common species and species of concern. USFWS confirmed ECT's conclusion of no anticipated adverse effects given that there will be no tree clearing. Results of agency consultation efforts are detailed in Sections 4906-4-08(B)(2)(b) and (3)(b) of this Application and in the Ecological Assessment (Exhibit P).

Upon completion of the on-site field survey, ECT determined plant species of recreational and commercial value, other than cultivated crops, are unlikely to occur within the Project boundary or the surrounding 0.25-mile area, consistent with the

literature survey. ECT concluded there is no habitat that could support sport fishing, no habitat for rare/popular birds for recreational birding, and no non-cultivated tracts suitable for hunting game birds or deer.

Wildlife common to agricultural regions of Ohio, such as deer and furbearers, may use wind rows and riparian areas with the Project boundary as corridors and/or foraging areas. Best Management Practices (BMPs) can be utilized to minimize potential impacts to these species. Further, Applicant has designed the site layout to avoid wooded and riparian areas, as depicted in Exhibit A, and will utilize a small-wildlife-permeable fence surrounding the solar array area to minimize impacts to commonly occurring wildlife species in the region.

(e) Summary of Additional Ecological Impact Studies

All ecological impact studies are discussed above in Section 4906-4-08(B)(1)(b) and (d) of this Application. Based on the results of the field surveys and consultation with the ODNR and USFWS, there is no requirement for additional ecological studies.

(2) Ecological Impacts During Construction

(a) Construction Impact on Undeveloped Areas, Plants, and Animals

The proposed Facility will be located entirely on leased, private land, so there will not be any construction-related impacts to recreational areas, parks, public wildlife areas, nature preserves, or other conservation areas. There are no undeveloped

conservation areas in or adjacent to the Project Layout Area. Proposed impacts from construction will occur largely in tilled agricultural fields (Table 8-4). During construction there may be temporary impacts to ecological resources from site preparation, earth-moving, excavation, and back-filling activities. Any impacts will be minimized through BMPs. The Ecological Assessment (Exhibit P) includes additional information including the acreage of potential impacts, impacts to ecological resources, vegetated areas, and wetland features.

Land Cover Type	Acres	Percentage (%)
Agriculture	530	97
Deciduous Forest	3.0	<1
Developed	16.3	2.9
Wetlands/Waterbodies	<1	<1
Total Acreage	549.3	100

Table 8-5. Land Use Impacts

Chestnut Solar anticipates no impact to delineated wetlands or streams in the Project Area. Collection lines will not cross any wetlands or streams. Based on the Project layout, no wetlands or waters will be temporarily or permanently impacted during construction. No clearing of wooded areas is anticipated for construction or operation of the Project. The Landscape Plan (Exhibit C) includes details of planting additional vegetative buffers (i.e. tree rows and wooded areas) proposed as part of the Project. The Ecological Assessment (Exhibit P) goes into further detail regarding the impacts to wildlife and their habitats; however, there are no anticipated impacts.

(b) Description of Short-Term and Long-Term Mitigation Procedures

(i) Site restoration and stabilization of disturbed soils

Reclamation objectives are to re-vegetate in order to stabilize exposed soils and control sedimentation and erosion at the site as well as to ensure that the Project area can be converted back to its preconstruction agricultural use after decommissioning.

After construction, disturbed areas will be restored to their preconstruction form. Soil will be decompacted, regraded, and reseeded with a native seed mix. Decompaction will take place in areas where topsoil is displaced, such as in laydown yards. Underground collection lines will be backfilled with segregated topsoil and subsoil. Throughout construction, topsoil and subsoil segregation will occur, and soil treatment may be required in order to preserve the agricultural capability of the soil after the lifespan of the Project. Stockpiles of removed material and demolition debris will be transported off-site to either a recycling facility or a landfill.

(ii) Frac out contingency plan

Applicant has not developed a frac out contingency plan because no stream crossings will be necessary for buried underground cabling installation. As a result, no HDD crossing of streams are anticipated. If an HDD crossing of a stream were to become necessary for the Project, a frac out contingency plan will be developed and provided to the Board.

(iii) Methods to demarcate surface waters and wetlands and to protect them from entry of construction equipment and material storage or disposal

Boundaries of surface waters and wetlands will be surrounded by highly visible, exclusionary fencing in order to set the boundaries of the avoidance areas. These areas will be marked as "Environmentally Sensitive Areas" on the Project layout and final construction drawings. On-site training provided to all contractors and subcontractors will emphasize the defined limits of the work area, the significance of flagging used, and areas of marked sensitive resources such as wetlands.

(iv) Procedures for inspection and repair of erosion control measures, especially after rainfall events

Chestnut Solar will seek coverage under the OEPA Construction Storm Water General NPDES Permit No. OHC000005. This permit requires a SWPPP and regular inspection of erosion control measures.

A qualified individual will inspect erosion and sediment control measures throughout construction in order to ensure they are functioning in accordance with applicable standards. Disturbed areas used for storage subject to precipitation will be inspected for potential pollutant runoff into the drainage system. These inspections will occur once a week and within 24 hours of any precipitation event of 0.5 inch or greater. Control measures will be inspected until 70 percent permanent vegetated cover has been established across disturbed areas.

An inspection report will be completed after each inspection and will include the inspection date, names and qualifications of the inspector, weather information,

descriptions of discharges and when they occurred, locations of BMPs that need to be maintained, and recommended corrective actions.

A Notice of Termination (NOT) form that follows NPDES permit requirements will be submitted to the OEPA after the site stabilization. Chestnut Solar will maintain SWPPP inspection results for three years after submitting a NOT.

(v) Methods to protect vegetation

The primary measure to protect vegetation is avoidance. The Project Area is primarily composed of agricultural land; therefore, significant impacts to grasslands, forested areas, shrubland, and wetland areas are not anticipated. During construction, measures will be taken to protect vegetation, such as identifying and demarcating sensitive areas such as wetlands, educating the workforce to adhere to the boundaries of ecologically sensitive areas, limiting disturbance to the smallest area possible, preserving mature trees, and maintaining clean work areas. After construction is complete, disturbed areas will be reseeded with native vegetation. More information about vegetation protection can be found in the Landscape Plan (Exhibit C).

(vi) Options for disposing of downed trees, brush, and other vegetation

No tree or brush clearing is anticipated; therefore, this section is not applicable.

(vii) Avoidance measures for state of federally listed and protected species and their habitat

As discussed in the Ecological Assessment (Exhibit P), there is neither critical nor suitable habitat for federally and state listed species within the Project Area. There is no suitable

habitat for listed species, and there is no post-construction wildlife monitoring currently planned. Because tree clearing is not needed, the Project avoids any potential impacts to bat species. If tree clearing is needed, ODNR guidance will be followed (i.e., no tree clearing activities between April 1 and September 30). No bald eagle nests were identified during field surveys (Exhibit AA). If a bald eagle nest were to be identified prior to or during construction, however, no Project construction activities will occur within 660 feet of the identified bald eagle nest from mid-January to August. If a federally or state listed species is observed during construction, Chestnut Solar will contact OPSB staff within 24 hours. Construction that may adversely impact the observed species will be halted until an agreement between Chestnut Solar, the Board, USFWS, and the ODNR is reached.

(3) Operational Ecological Impacts

(a) Provide an evaluation of the impact of operation and maintenance on the undeveloped areas shown in response to paragraph (B)(1) of this rule

During operation, there may be minor impacts to vegetation and/or animal species during maintenance and occasional repair activities, but these are not expected to be environmentally injurious. There will be no impacts to undeveloped conservation areas, such as wildlife areas and nature preserves, because the Project Area is located on leased private land, as explained in Section 4906-4-08(B)(1)(a).

(b) Describe the procedures to be utilized to avoid, minimize, and mitigate both the short- and long-term impacts of operation and maintenance

Applicant does not anticipate any additional ecological impacts from the Project after construction is completed. The Project layout avoids wetland and waterbodies. Solar energy facilities have very little direct impact on wildlife because they do not present a collision risk for avian and bat species. Tree clearing is not expected; therefore, the Project avoids any potential impacts to bat species. If tree clearing is needed, ODNR guidance will be followed (i.e., no tree clearing activities between April 1 and September 30). The Project Area is made up primarily of agricultural land and therefore does not currently offer habitat for most wildlife. The flat topography, vegetation, and landscape also reduce avian and bat presence in the Project Area. There are no anticipated operational impacts to wildlife resources and therefore no proposed mitigation measures. Best management practices will be employed to further reduce potential impacts to wildlife resources. Final practices will be detailed in the SWPPP.

(c) Post-Construction Monitoring for Wildlife Impacts

There are no anticipated significant impacts to wildlife from the construction and operation of the Project; therefore, Chestnut Solar does not have plans for post-construction monitoring.

(C) Land Use and Community Development

(1) Existing Land Use

(a) Land Use Map:

Figure 8-6 depicts land use within one mile of the Project Area. The land use map was compiled using data sources from NRCS, ODNR and the Marion County 2011 Land Use Plan.

(i) The proposed facility

The layout of the proposed Facility includes the fence line, PV panel arrays, underground and overhead electrical collection lines, inverters, access roads, Facility substation (including the generator step-up transformer connection to the POI switchyard), O&M container(s), and laydown yards contained within the Project Area. While the Applicant expects that the final layout will remain substantially similar to the preliminary Facility layout, there may be minor modifications resulting from ongoing technological innovations in the solar industry, continuing detailed engineering and survey work, public comments, and communications with Staff during the Board's certification process. The layout of the proposed facility is shown in Figure 3-1.

(ii) Land use, depicted as areas on the map

Land uses mapped within the Project Area and surrounding the Project Area are primarily agricultural and residential use. Zoning classifications for the Project Area and surrounding parcels are illustrated in Figure 8-6.

(iii) Structures, depicted as points on the map

Structures in the Project Area and surrounding areas are primarily rural residences. Pleasant High School is located 2.78 miles West of the Project. The Zion German Methodist Church off Kreis Rd is located 0.2 mi NE of the Project Area. There are ten (10) known cemeteries located within one mile of the Project Area. Structures within the Project vicinity are shown in Figures 3-1, 8-6 and 8-7.

(iv) Incorporated areas and population centers

The Facility will be located in Pleasant Township in Marion County, Ohio. There are no urban population centers within 1-mile of the Project boundary. The nearest population center is the city of Marion, approximately 4 miles northwest of the Project location, as shown in Figure 2-1.

(b) Structures and Property Lines Tables

(i) Distance of PV panels from existing structures and property lines

There are 174 parcels within 1,500 feet of a PV panel. Table 8-6 presents the distance to the nearest PV panel and the lease status of the underlying parcels.

Parcel ID	Distance to PV Panel (feet)	Lease Status of Underlying Parcels
310210001700	598	Non-Participating
250200001500	816	Non-Participating
250190001700	897	Non-Participating
250200001800	1042	Non-Participating
250210000500	1232	Non-Participating
300210000703	1189	Non-Participating
250200000800	950	Non-Participating
250220003701	926	Non-Participating
250380000315	1239	Non-Participating
250210001900	989	Non-Participating

250200002400	1192	Non-Participating
250200002200	1322	Non-Participating
250220002000	236	Participating
250220004301	1207	Non-Participating
250380001100	482	Non-Participating
250220002021	788	Non-Participating
250230002000	401	Non-Participating
250230002101	350	Non-Participating
250230001501	318	Non-Participating
250220002103	236	Participating
250200000900	871	Non-Participating
250220002032	374	Non-Participating
250380001702	227	Non-Participating
250230002207	334	Non-Participating
250220002105	609	Non-Participating
300200003100	360	Non-Participating
250230001300	147	Non-Participating
250190001400	626	Non-Participating
250230002208	215	Non-Participating
250220002041	404	Non-Participating
250220001400	241	Participating
250220001600	484	Non-Participating
250220002027	677	Non-Participating
250220002028	669	Non-Participating
250380001701	218	Non-Participating
250380000301	368	Non-Participating
250380001200	480	Non-Participating
250200001400	831	Non-Participating
250220002009	455	Non-Participating
250200001600	920	Non-Participating
250230000100	49	Participating
250190001000	882	Non-Participating
250220002042	601	Non-Participating
250200002900	603	Non-Participating
250230001700	657	Non-Participating
250210000200	1019	Non-Participating
250220002042	595	Non-Participating
250220003000	646	Non-Participating
250220002900	648	Non-Participating
250220002800	648	Non-Participating
250230002201	344	Participating

250230002200	203	Participating
250220002700	650	Non-Participating
250220003100	940	Non-Participating
250220002500	1027	Non-Participating
250220003300	640	Non-Participating
250230002206	461	Non-Participating
250220000800	1323	Non-Participating
250220003600	919	Non-Participating
250220000900	1258	Non-Participating
250220001700	402	Non-Participating
250230000700	208	Participating
250220003500	657	Non-Participating
250220004500	707	Non-Participating
250200002500	1073	Non-Participating
250220001000	1156	Non-Participating
250220002022	782	Non-Participating
250230001800	464	Non-Participating
250210000400	1156	Non-Participating
250230001200	189	Participating
250220002024	804	Non-Participating
250220002023	792	Non-Participating
250220003602	931	Non-Participating
250230002209	248	Non-Participating
250220002008	275	Non-Participating
250220004400	1291	Non-Participating
250220002025	818	Non-Participating
250210000300	1035	Non-Participating
250200002300	1192	Non-Participating
250220002005	188	Non-Participating
250220002033	172	Non-Participating
250220002034	215	Non-Participating
250200000700	1059	Non-Participating
250220002030	539	Non-Participating
250220002029	637	Non-Participating
250200000400	1364	Non-Participating
250220002036	257	Non-Participating
250220002040	167	Non-Participating
250220002037	399	Non-Participating
250220004300	1094	Non-Participating
250220002102	573	Non-Participating
250380001703	229	Non-Participating

250190001500	724	Non-Participating
250230000800	311	Non-Participating
250210002100	1009	Non-Participating
250230000200	996	Non-Participating
250380001700	142	Participating
250230000500	155	Non-Participating
250200003300	744	Non-Participating
250200003200	646	Non-Participating
250380001600	238	Non-Participating
250380001500	399	Non-Participating
250200001000	867	Non-Participating
250380001704	229	Non-Participating
250220001800	630	Non-Participating
250200002800	703	Non-Participating
250220002014	543	Non-Participating
250380001000	487	Non-Participating
250190001300	530	Non-Participating
250230002300	496	Non-Participating
250230000500	155	Non-Participating
250200001300	710	Non-Participating
300090002802	463	Non-Participating
250220001900	160	Non-Participating
250380001300	487	Non-Participating
250380000309	1437	Non-Participating
250200002100	1404	Non-Participating
250230001400	189	Non-Participating
250220003400	342	Non-Participating
250230002204	450	Non-Participating
250220002020	541	Non-Participating
250200001700	1100	Non-Participating
250220002017	210	Non-Participating
250220001100	974	Non-Participating
250380000100	271	Participating
250220002104	503	Non-Participating
250220002001	314	Non-Participating
250230000100	38	Participating
250200000500	1257	Non-Participating
250380000310	1341	Non-Participating
250220002012	237	Non-Participating
250220002013	401	Non-Participating
250220002044	418	Non-Participating

250190001600	807	Non-Participating
250220002003	475	Non-Participating
250230002203	370	Non-Participating
250220002038	528	Non-Participating
250200001200	930	Non-Participating
250220002011	197	Non-Participating
250200001100	689	Non-Participating
250220002043	629	Non-Participating
250220002019	380	Non-Participating
250200001900	1313	Non-Participating
250200000300	1451	Non-Participating
250220001401	254	Non-Participating
250380001400	801	Non-Participating
250200002000	1416	Non-Participating
250230002205	236	Non-Participating
250380000800	499	Non-Participating
250380000901	494	Non-Participating
250220002018	206	Non-Participating
250230001500	161	Non-Participating
250380000308	1489	Non-Participating
250230001900	462	Non-Participating
250220002101	173	Non-Participating
250200000600	1145	Non-Participating
250210000100	860	Non-Participating
250230001600	188	Non-Participating
250200000101	1344	Non-Participating
250200002600	906	Non-Participating
310210001900	418	Non-Participating
300210003000	418	Non-Participating
300210002900	418	Non-Participating
250220001500	484	Non-Participating
250230002202	296	Non-Participating
250380000900	754	Non-Participating
250190001201	734	Non-Participating
250210001601	766	Non-Participating
250210001701	917	Non-Participating
250220002007	351	Non-Participating
250220002026	756	Non-Participating
250190001101	655	Non-Participating
250220002100	634	Non-Participating
250200002700	797	Non-Participating

250200003000	443	Non-Participating
250210000600	1335	Non-Participating
250220002015	563	Non-Participating
250220002010	259	Non-Participating
250220003301	633	Non-Participating
250380000700	194	Non-Participating
250380001900	212	Non-Participating
250380000200	298	Non-Participating

Table 8-6. Parcels within 1,500 feet of a PV Panel

Distances between the PV panels and existing structures within 1,500 feet are shown in Table 8-7 below. There are 129 structures within 1,500 feet of a PV panel.

Parcel ID	Structure Type	Distance to PV Panel (feet)	Lease Status of Underlying Parcel
250200001500	Residence	830	Non-Participating
250190001700	Residence	946	Non-Participating
250200001800	Residence	1052	Non-Participating
250210000500	Residence	1303	Non-Participating
300210000703	Residence	1480	Non-Participating
250200000800	Residence	1009	Non-Participating
250220003701	Residence	1024	Non-Participating
250380000315	Residence	1390	Non-Participating
250210001900	Residence	1214	Non-Participating
250200002400	Residence	1205	Non-Participating
250200002200	Residence	1343	Non-Participating
250220004301	Residence	1321	Non-Participating
250380001100	Residence	601	Non-Participating
250220002021	Residence	861	Non-Participating
250230002000	Residence	530	Non-Participating
250230001501	Residence	477	Non-Participating
250230001501	Storage/Shed	344	Non-Participating
250230002100	Residence	485	Non-Participating
250230002100	Storage/Shed	353	Non-Participating
250200000900	Residence	928	Non-Participating
250380001702	Residence	355	Non-Participating

250230002207	Storage/Shed	356	Non-Participating
250230002207	Residence	454	Non-Participating
250220002105	Residence	737	Non-Participating
250230001300	Residence	201	Non-Participating
250190001400	Residence	649	Non-Participating
250230002208	Residence	331	Non-Participating
250220002041	Residence	528	Non-Participating
250220001600	Residence	583	Non-Participating
250220002028	Residence	739	Non-Participating
250380001701	Residence	358	Non-Participating
250380001701	Storage/Shed	236	Non-Participating
250380001200	Residence	523	Non-Participating
250200001400	Residence	856	Non-Participating
250220002009	Residence	490	Non-Participating
250200001600	Residence	930	Non-Participating
250190001000	Residence	923	Non-Participating
250220002042	Residence	640	Non-Participating
250200002900	Residence	628	Non-Participating
250230001700	Residence	815	Non-Participating
250210000200	Residence	1058	Non-Participating
250220002042	Residence	639	Non-Participating
250230002206	Residence	569	Non-Participating
250220000800	Residence	1374	Non-Participating
250220000900	Residence	1282	Non-Participating
250220001700	Residence	545	Non-Participating
250220003500	Residence	690	Non-Participating
250200002500	Residence	1127	Non-Participating
250220001000	Residence	1189	Non-Participating
250220002022	Residence	860	Non-Participating
250230001800	Residence	653	Non-Participating
250210000400	Residence	1239	Non-Participating
250220002024	Residence	886	Non-Participating
250230002209	Residence	394	Non-Participating
250220002008	Residence	521	Non-Participating
250220002025	Residence	882	Non-Participating
250210000300	Residence	1139	Non-Participating
250200002300	Residence	1214	Non-Participating
250220002005	Residence	304	Non-Participating
250200000700	Residence	1123	Non-Participating
250220002030	Residence	623	Non-Participating

250200000400	Residence	1406	Non-Participating
250220002036	Residence	317	Non-Participating
250220004300	Residence	1223	Non-Participating
250220002102	Residence	689	Non-Participating
250380001703	Agricultural	311	Non-Participating
250190001500	Residence	749	Non-Participating
250230000800	Agricultural	975	Non-Participating
250210002100	Agricultural	1396	Non-Participating
250200003300	Residence	737	Non-Participating
250200003200	Residence	737	Non-Participating
250380001600	Agricultural	272	Non-Participating
250380001500	Residence	406	Non-Participating
250200001000	Residence	923	Non-Participating
250380001704	Residence	350	Non-Participating
250220001800	Residence	753	Non-Participating
250200002800	Residence	728	Non-Participating
250220002014	Residence	585	Non-Participating
250380001000	Residence	601	Non-Participating
250230002300	Agricultural	1497	Non-Participating
250200001300	Residence	752	Non-Participating
250220001900	Residence	463	Non-Participating
250220001900	Residence	771	Non-Participating
250380001300	Residence	657	Non-Participating
250200002100	Residence	1438	Non-Participating
250230001400	Residence	308	Non-Participating
250220003400	Residence	737	Non-Participating
250220002020	Residence	583	Non-Participating
250200001700	Residence	1134	Non-Participating
250220002017	Residence	300	Non-Participating
250220001100	Residence	1083	Non-Participating
250380000100	Agricultural	274	Participating
250220002104	Residence	626	Non-Participating
250220002001	Residence	328	Non-Participating
250200000500	Residence	1293	Non-Participating
250380000310	Residence	1447	Non-Participating
250220002013	Residence	451	Non-Participating
250190001600	Residence	837	Non-Participating
250220002004	Residence	523	Non-Participating
250230002203	Residence	462	Non-Participating
250220002011	Residence	300	Non-Participating

250200001100	Residence	749	Non-Participating
250220002019	Residence	402	Non-Participating
250200001900	Residence	1335	Non-Participating
250200000300	Residence	1495	Non-Participating
250220001401	Residence	470	Non-Participating
250220001401	Storage/Shed	264	Non-Participating
250380001400	Residence	998	Non-Participating
250200002000	Residence	1452	Non-Participating
250230002205	Residence	326	Non-Participating
250380000800	Residence	584	Non-Participating
250380000901	Residence	690	Non-Participating
250220002018	Residence	302	Non-Participating
250230001500	Residence	338	Non-Participating
250230001900	Residence	619	Non-Participating
250220002101	Residence	300	Non-Participating
250200000600	Residence	1193	Non-Participating
250210000100	Residence	945	Non-Participating
250230001600	Residence	308	Non-Participating
250200000101	Residence	1408	Non-Participating
250200002600	Residence	938	Non-Participating
250220001500	Residence	585	Non-Participating
250230002202	Residence	459	Non-Participating
250190001200	Residence	756	Non-Participating
250220002007	Residence	421	Non-Participating
250220002026	Residence	816	Non-Participating
250190001100	Residence	738	Non-Participating
250220002100	Residence	751	Non-Participating
250200002700	Residence	820	Non-Participating
250200003000	Residence	483	Non-Participating
250210000600	Residence	1413	Non-Participating
250220002015	Residence	609	Non-Participating
250220002010	Residence	324	Non-Participating

Table 8-7. Structures Within 1500 Feet of PV Panels

(ii) Distance of associated facilities from existing structures and property lines

The nearest adjoining resident will be at least 300 feet from the closest solar panel. Distances between associated

facilities and existing structures within 250 feet are shown in Table 8-8 below. There are 13 structures within 250 feet of an associated Facility component (collection line, access road, laydown area, O&M container(s) or collection substation).

Structure Type	Parcel ID	Distance to Associated Facility Component (feet)	Closest Facility Component	Lease Status
Garage	250220002104	43	Laydown Yard	Not Leased
Residence	250220002104	74	Laydown Yard	Not Leased
Shed	250220002100	190	Laydown Yard	Not Leased
Residence	250220002100	241	Laydown Yard	Not Leased
Residence	250220003400	207	Laydown Yard	Not Leased
Residence	250220003500	144	Access Road	Not Leased
Residence	250220003500	112	O&M Container	Not Leased
Ag Structure	250220002001	186	O&M Trailer	Not Leased
Ag Structure	250220002001	216	Access Road	Not Leased
Residence	250220002001	213	O&M Trailer	Not Leased
Residence	250380001500	198	MV Line	Not Leased
Ag Structure	250380000100	223	Access Road	Leased
Ag Structure	250380000100	167	MV Line	Leased

Table 8-8. Structures within 250 feet of an Associated Facility

(iii) For each structure and property in the table, whether the property is being leased by the applicant for the proposed facility

The lease status for each structure and property within 1,500 feet of a PV panel is presented in Table 8-6 and Table 8-7 respectively and each structure within 250 feet of an associated facility is presented in Table 8-8.

(c) Land Use Impacts

The Project has been sited on agricultural land. The majority of impacts to the Project Area will occur as a result of upland soil disturbance for the construction of access roads and placement

of fencing. Figure 8-6 presents the different land uses within the Project Area. Table 8-9 below represents the temporary and permanent land use impacts, by Project component.

Facility Component	Temporary Impact Upland Soil (Acres)	Permanent Impact Upland Soil (Acres)	Total Impact Upland Soil (Acres)
Solar Arrays	0	360	360
Access Roads	0	20.1	20.1
Inverter Pads	0	0.7	0.7
Buried Collection Lines	4.1	0	4.1
Collection Substation	0	1.4	1.4
O&M Trailer	0	0.9	0.9
Laydown Yards	3.4	0	3.4
Fence	0	490.8	490.8
Total	**7.5**	**873.9**	**881.4**

Table 8-9. Project Land Use Impacts by Project Component

(d) Identify structures that will be removed or relocated

There are no structures proposed to be removed for construction of the Project.

(2) Wind farm maps.

This section does not apply because the Facility is not a wind farm.

(3) Setback waivers.

This section is specifically intended for wind-powered facilities and therefore does not apply to this Facility.

(4) Land Use Plans

(a) Formally Adopted Plans for Future Use of Site and Surrounding Lands

Marion County's 1977 Land Use Plan was revised in 2011 and adopted by the Marion County Regional Planning Commission and the Marion County Commissioner in September 2011 and March 2012. The Land Use Plan analyzed the physical characteristics of the county and reviewed trends related to population, housing, employment, business, and land use changes on a subdivision basis from 1995 to 2009. The Land Use Plan then established goals and objectives for the various land use categories. Key goals and objectives are: (1) Prepare the county for constructive absorption of the population and economic growth which will occur in the coming decades and for preservation of agricultural development opportunities; (2) Take the steps necessary to strengthen Marion County as the major center of employment, trade, education, and culture in its seven-county region; (3) Minimize both public and private expenses by reducing conflicts between landowners and society; and (4) Promote the public health, safety, and welfare of the residents of Marion County.

The Marion County Land Use Plan does not propose changes to future land use of the Project Area or the vicinity, which is currently zoned for agricultural/low density residential (Marion County 2011). The Project is consistent with Marion County's Land Use Plan in that it promotes positive economic growth for the community and is compatible with the land's future

agricultural use. The total development of the Project is anticipated to create over 70 new local jobs for Marion County and over 130 new local jobs for the State of Ohio during construction. Earnings during construction are expected to be $5.3 million in new local earnings during construction for Marion County and $10.8 million for the state of Ohio (Loomis or SER).

The Facility offers the use of local goods and services during construction and through the life of the Project.

Although changes in land use will occur within the Project area, none will affect the highest and best use of properties outside the Project area. Nor will the Facility interfere with other land uses. There are no air pollutants associated with the operation of the Project. The Facility will not discharge water or waste into streams or water bodies. Construction and operation of the Project will not interfere with future proposed development, nor will it pose a threat to public health, safety or the welfare of the county residents. In these ways, the Project is wholly consistent with the Marion County Land Use Plan.[6] Following decommissioning of the Facility, the land will revert to agricultural use. Therefore, Chestnut Solar will ensure that

[6] On February 9, 2023, the Marion County Board of Commissioners adopted Resolution #2023 opposing construction and operation of Chestnut Solar's Facility. This Resolution was premised, however, on the assumption that the Facility was not grandfathered under Senate Bill 52. Counsel for the Marion County Board of Commissioners has since confirmed his concurrence that the Chestnut Solar Project is grandfathered under Senate Bill 52 as well as represented to Chestnut Solar's counsel that he has advised the Marion County Board of Commissioners accordingly.

decommissioning results in conditions commensurate with those existing pre-Project.

Pleasant Township in Marion County adopted a zoning resolution in November 1970, which was revised in March 2021. This zoning resolution does not provide for any other specific future use of the Project area or surrounding lands, though the March 2021 revision did impose a prohibition on development of solar and wind generation facilities less than 50 MW.

(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 of the proposed facility on regional development

Housing and commercial development within five miles of the Project Area is driven by the rural economy of Marion County. The economy is primarily driven by agriculture with approximately 205,000 acres of crop lands. Within and surrounding the Project Area, corn and soybean agriculture make up the majority of the land use.

Housing development and related demand depend on a multitude of factors. The 2019 median property value in Marion County is $100,800. Within a mile of a solar farm in Ohio and adjoining states, the median housing unit value is $173,079. More information on the impacts on regional development is provided in the Economic Impact and Land Use Analysis Report (Exhibit F). The Applicant conducted a Property Value Study

Impact (Exhibit U) to determine if the proposed Project will have any impact on adjoining property values. The study concludes that the Facility will have no impact on the value of adjoining or abutting properties and that the proposed use is in harmony with the area in which it is located. The adjoining properties have sufficient setbacks from the proposed solar panels as each home will be set back at least 300 feet and the site design includes vegetative screening. The matched pair analysis shows no impact on home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land where the solar farm is properly screened and buffered. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas and that it would function in a harmonious manner with this area. Public services will be minimally affected, as only area roadway traffic will be slightly impacted according to the Construction Route Study and Road Condition Report (Exhibit I). Impacts to the regional transportation system will be negligible after construction.

The Project is expected to increase local tax revenues and contribute to the local economy with jobs and increased funding to schools and emergency services. The Pleasant Local School District will receive over $424,000 annually and over $19 million in total over the 45-year life of the Project. The Pleasant Township Fire District will receive over $38,000 annually and over $1.7 million in total over the life of the Project. The Tri-Rivers Joint Vocational School District will receive over $35,000

annually and over $1.6 million in total over the life of the Project. The total taxes paid will be $612,000 annually from PILOT. Other taxing districts will receive between $1,635 and $35,567 annually as detailed. The Project is not expected to negatively impact housing, transportation system development, or other public services and facilities

(d) Compatibility of the proposed facility and the anticipated resultant regional development with current regional plans

The Marion County Regional Planning Commission and the Marion County Commissioner adopted a Land Use Plan in September 2011 and March 2012. The Project will not conflict with the Marion County Land Use Plan, which does not require any specific use or propose changes to future land use of the Project area. The compatibility of the Facility with those plans is discussed in Section 4906-4-08(C)(4)(a) of this application.

(e) Provide current population counts or estimates, current population density, and ten-year population projections for counties and populated places within five miles of the project area

The U.S. Census estimates that the 2020 population of Marion County was 65,359. The population of Marion County from the U. S. Census from 2010 was 66,505 or a decrease of 0.017%. The estimated population of Marion County is 2030 is expected to be approximately 64,242. The current population density of Marion County is approximately 161.7 persons per square mile. The population of Marion Township from the 2010 Census was 44,749 and according to CensusReporter.org the population is currently estimated at 43,653. Based on HomeTownLocator.com

the population for Pleasant Township for 2021 was 4,873. The only populated place within 5 miles of the Project Area is the City of Marion which has a population of 35,999 at the 2020 U. S. Census. The City of Marion recorded a population of 36,828 during the 2010 U. S. which is a decrease of 0.02 % over a 10-year period. Using the rate of change since the 2010 U. S Census the population for the City of Marion and Marion Township is expected to be approximately 35,279 and 42,780 respectively in the year 2030.

(D) Cultural and Archaeological Resources

Stantec completed a Historic Architectural Reconnaissance Survey in April 2022 (Exhibit R). Using Ohio SHPO guidance, the survey covered a two-mile radius around the Project Area as the Area of Potential Effect (APE). The April 2022 survey identified seven potentially NRHP-eligible properties in the APE. No national historic landmarks were identified in the APE.

Stantec also completed a Phase 1 Archaeological Field Reconnaissance Survey in Q2 2022 (Exhibit S). Using Ohio SHPO guidance, the survey covered a two-mile radius around the Project Area as the APE. A literature review identified the following within the APE: 12 archaeological sites, 16 cemeteries and 19 historic structures. None of these features are located within the Project area. The field work completed in May 2022 identified 41 new archaeological sites, none of which were recommended eligible for listing in the NRHP. The Ohio SHPO concurs with this recommendation and determined no additional archaeological investigation is necessary (Exhibit T).

(1) Landmarks of Cultural Significance Map

Figure 8-7 illustrates formally adopted land and water recreation areas, recreational trails, scenic rivers, scenic routes or byways and registered

landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance within 10 miles of the Project Area.

Stantec reviewed numerous sources of information relating to archaeological and historic resources located within the Cultural Resources Study Area, including:

- National Register of Historic Places (NRHP)
- NRHP Determinations of Eligibility
- National Historic Landmarks
- Ohio Historic Inventory
- ODOT Historic Bridge Inventory
- Ohio Archaeological Inventory
- Ohio Genealogical Society cemetery files
- Mills Archaeological Atlas of Ohio (1914)
- Previous SHPO cultural resources surveys

(2) Impacts on Landmarks and Mitigation Plans

Impacts to known cultural, archaeological, and architectural resources are summarized above and in Exhibits R and S. All archaeological and architectural field surveys for the Project Area were completed in April 2022. All identified resources have been avoided. Chestnut Solar consulted with the Ohio SHPO for guidance on mitigation measures and visual screening. The Visual Resource Assessment and Mitigation Plan (Exhibit V) provides more information regarding landmarks and visual impacts mitigation plans.

(3) Impacts on Recreational and Scenic Areas and Mitigation Plans

Scenic and recreational areas within a 10-mile radius of the Project Area were obtained using publicly available GIS data sources from (USGS, OGC, NRHP, Ohio SHPO, NRCS and is shown in Table 8-10).

Recreational Area	Distance from Project Area (miles)
Kings Mill Golf Club, Waldo Township	1.4 miles E of Project Area
Delaware Strine Wildlife Area, Marion County	2.4 miles SE of Project Area
Miracle Driving Range, Marion Township	2.7 miles NW of Project Area
Green Acres Golf Course, Marion Township	3.3 miles W of Project Area
McKinley Park, Marion Township	3.5 miles NW of Project Area
Marion Country Club, Marion Township	3.7 miles NW of Project Area
Delaware Wildlife Area, Marion County	3.8 miles NW of Project Area
Sawyer Ludwig Park, Marion Township	3.9 miles NW of Project Area
Garfield Park, Marion Township	3.9 miles NW of Project Area
Patterson Park, Marion Township	4.8 miles NW of Project Area
Big Island Wildlife Area, Marion County	4.9 miles NW of Project Area
Martin Luther King Jr Memorial Park, Marion Township	5 miles NW of Project Area
Lincoln Park, Marion Township	5.4 miles NW of Project Area
Blake St Park, Marion Township	5.4 miles NW of Project Area
Delaware-Whetstone Wildlife Area, Morrow County	6.5 miles SE of Project Area
Delaware State Park, Delaware County	7.5 miles S of Project Area
Hickory Grove Lake Campground, Marion Township	9.1 miles NW of Project Area

Table 8-10. Recreational Areas within 10 Miles

Seventeen scenic and recreational areas occur within ten miles of the Project Area. The Project will not be visible to or from any of the recreational areas. The Kings Mill Golf Club is the closest recreational area to the Project Area. The area between the Kings Mill Golf Club and the Project has many wooded areas and tree rows and the panels will not be seen from this location. The Project would not be visible from any of the recreational areas listed in Table 8-10. Existing highways and homes located between the Project and the Kings Mill Golf Club further obstruct the visibility of the panels and would minimize any visual impact to the golf club and the other recreational areas. Additional information regarding the results of the viewshed analysis is provided in section 4906-4-08(D)(4).

(4) Visual Impact of Facility

Stantec prepared a Visual Resource Assessment and Mitigation Plan for the proposed Project (Exhibit V). The Visual Resource Assessment and Mitigation Plan analysis was completed by GIS professionals and environmental specialists using detailed topographic data, including Light Detection and Ranging (LiDAR) data, and spatial analysis software (ESRI). The viewshed was analyzed for a five-mile radius around the Project Area. Though a five-mile radius was analyzed based on a topographic model, the low profile (i.e., the 15-foot maximum height) of the solar panels makes it unlikely that any part of the Facility would be visible beyond 1.5 miles away, considering the existing structures and vegetation as well as the limitations of human eyesight.

(a) Facility Visibility and Viewshed Analysis

The Visual Resource Assessment and Mitigation Plan (Exhibit V) determined that the project was visible in 4.5 percent of the 1.5-mile radius visual study area (VSA). Panel visibility was highest within 0.5 mile of a panel. Beyond 1.5 miles from the panels, visibility was substantially reduced. Due to the combination of relatively low panel height, topography, existing vegetation, and stream corridors within the VSA, visibility of the solar modules is further reduced at distances beyond the foreground with less than 1 percent of the Project visible within the middle ground (1.5 to 4 miles) and background (4 to 5 miles).

(b) Evaluation of Existing Landscape and Scenic Quality

The majority of the landscape in the visual study area is agricultural fields (96.5 percent). Developed areas compose an additional 2.9 percent of the visual study area. The remaining

area is deciduous forests that are narrow tree rows scattered along portions of the Project area boundary.

The Project area is primarily within the cultivated crops landscape type, which makes up about 69.1 percent of the VSA. Such agricultural lands are generally devoid of substantial stands of mature vegetation and widespread structures; therefore, this landscape type may offer greater opportunity for views of the solar modules within the surrounding area absent vegetative screening. Additionally, about 18.2 percent of the VSA consists of the developed landscape type. Development is dispersed throughout the VSA, but primarily concentrated within the City of Marion located about two miles northwest of the Project area, and the village of Waldo located about 2.6 miles south of the Project area. The developed landscape type typically provides limited open views toward surrounding lands due to the presence of buildings, residences, landscaped yards/planted vegetation, utility lines, and other infrastructure. Other landscape types within the VSA consist of forest (about 9 percent); pasture/hay, grasslands/herbaceous, shrub/scrub, barren land (about 3 percent); and open water and wetlands (0.7 percent). Views from within the forest landscape types are typically limited due to the presence of dense vegetation. As with the cultivated crops landscape type, the pasture/hay, grassland/herbaceous, shrub/scrub, and barren land landscape types typically lack mature vegetation and development; therefore, these landscape types may provide open views toward the Project area. The open water and wetland landscape

types also typically provide limited open views due to dense vegetation and lower topography.

(c) Landscape Alterations and Impact on Scenic Quality

Panels will be located in existing agricultural fields, and the clearing of forested areas will be avoided. Though the panels will alter the existing landscape, visual impacts will be limited due to the low profile of the panels. Panels will only be visible from agricultural fields near installed panels and from homes and structures near agricultural fields. Views from villages and developed areas such as the City of Marion will completely be obstructed by existing trees, forested areas and the distance from the panels.

(d) Visual Impacts to Landmarks of Cultural Significance

The Historic Architectural Reconnaissance Survey identified 146 properties in the survey area, of which seven were recommended eligible for the NRHP. Of those seven, none would have visual impacts (i.e., panels visible from the residence or structure). The proposed NRHP-eligible properties range from 0.21 to 1.69 miles from the Project footprint. The low height of the proposed solar panels decreases the visibility from neighboring properties. Existing structures, such as US Highway 23, a non-historic subdivision, and existing overhead utility lines, are already within the viewshed of some of these properties. Additionally, existing vegetation limits the visibility of the Project from these properties, such as from groves of trees at a local cemetery, along Qua Qua Creek and along the Project boundary.

As stated in the SHPO response letter in Exhibit T, the eligible resources will have no views, or limited views of the project area. Vegetation, distance, and intervening buildings limit the potential of visual effects from the project. Limited visibility of the project will not impact the significance or integrity of the historic resources in a way that would alter their NRHP eligibility.

(e) Photographic Simulations

A total of four representative locations were selected for photographic simulations. These locations include a simulation of the Facility substation and an O&M container. The locations represent a range of PV panel arrangements that characterize the project in the local landscape. The visual effect of the substation is shown from Location KOP2, as defined in the Visual Resource Assessment (Exhibit V). Due to the distance (approximately 650 feet) to the simulated location and the intervening solar panels, the visual impacts of the substation are minimized.

(f) Impact Minimization Measures

The Project proposes a range of mitigation measures to limit its visual impact. The Project will be located in a rural area, which lowers the number of homes in the vicinity to begin with and reduces its visual impact. The Project will maintain greater-than-required setbacks from homes, roads, and non-participating parcel boundaries. As shown in the Site Plan in Exhibit A, the Facility will be set back 100 feet from parcel boundaries and 300 feet from dwellings. The Project panels will

use an anti-glare coating that will reduce the visual impact of glare from the panels (Exhibit N). The Project will avoid the clearing of existing forest areas that create natural visual screening for the panels. Additional screening will be placed along areas of high visibility and within close proximity to homes. The planned vegetative screening along Myers Road and Highway 23 will minimize visual impacts of the Project substation. Similarly, vegetative screening along the northern site perimeter will limit visibility of the O&M container(s) on site. The Landscape Management Plan (Exhibit C) includes details for the proposed screening measures.

Permanent lighting during Project operations will be necessary to provide safety and site security. High traffic and/or entrance areas of the Project will have switched, or motion activated safety and security lighting that will be downlit. Lighting at the substation will consist of five footcandles at the control building interior locations and two footcandles each for the five exterior locations outside of the substation; these levels accord with local code requirements. Details on lighting are included in the Lighting Plan in Appendix B of Exhibit C.

(E) Agricultural District Impacts

(1) Agricultural Land and Agricultural District Land Map

In 2017, Marion County had 615 farms covering 203,860 acres for an average farm size of 331 acres (Census, 2017). The Project area consists almost exclusively of agricultural land. The Facility Footprint only uses approximately 404 acres or 0.2% of current cropland. The placement of the

Facility does not require extensive buildout of new roads, nor does it require new sewer system construction.

As outlined in Table 8-11 below, the entire leased area of 562 acres is currently in the Current Agricultural Use Value ("CAUV") program but is not listed as agricultural district land.

Parcel Classifications					
Parcel Number	**Approximate Size (Acres)**	**Land Use**	**CAUV Program**	**Zoning Designation**	**Agricultural District**
250220002000	124.02	199 OTHER AGRICULTURAL USE (C.A.U.V.)	Yes	R-1 (Residential)	No
250220002103	4.26	100 AGRICULTURAL VACANT LAND	No	R-1 (Residential)	No
250220001400	51.34	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	R-1 (Residential)	No
250230000100	10.56	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	R-1 (Residential)	No
250230000700	79.78	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	R-1 (Residential)	No
250230001200	55.08	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	A-1 (Agricultural)	No
250230002201	33.14	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	A-1 (Agricultural)	No
250230002200	31.10	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	A-1 (Agricultural)	No
250380001700	46.49	110 AGRICULTURAL VACANT LAND (C.A.U.V.)	Yes	A-1 (Agricultural)	No
250380000100	126.17	111 GENERAL FARM WITH DWELLINGS (C.A.U.V)	Yes	A-1 (Agricultural)	No

Leased Area	**561.94**				

Table 8-11 CAUV Program Parcel Classifications

(2) Agricultural information

The Facility will be almost entirely located on agricultural land that is currently in the CAUV program.

(a) Acreage Impacted

Figure 4-1 depicts the current land use and Project layout in the Project Area. Of the 562 acres of leased area, the Project Layout Area will occupy approximately 549.3 acres. Land use within the Project Layout Area is primarily agricultural consisting of approximately 529.7 acres (Table 8-5). For the life of the Project, approximately 404 acres of agricultural land will be converted to accommodate the Project facilities. The proposed Project layout was developed for the purpose of evaluating potential land, environmental, and human settlement impacts in the Project Area. Further design and refinements to the Project layout will be made after a Certificate is issued by the OPSB and prior to construction with the intent to decrease the overall Project layout area to the extent practicable.

(b) Impacts on Agricultural Facilities and Practices

(i) Field operations

The components and infrastructure necessary for operation of the Facility will occupy approximately 404 acres of agricultural land for 45 years. During this period, plowing, planting, cultivating and harvesting will not be conducted. Once the

facility has reached its useful life, the Facility components will be removed, and the Project area will be restored for agricultural use.

(ii) Irrigation

The applicant will coordinate with participating and cooperative landowners to identify potential irrigation systems that may be impacted by the project.

(iii) Field drainage systems

The drain tile systems in the Project Area could be impacted by the Facility. The Applicant has coordinated with landowners to identify drain tiles within the Project Area. While mitigation measures will be implemented, drain tile impacts may occur. The location of known drain tile is presented in the Drain Tile Plan (Exhibit W), which has been reviewed by the Marion County Soil & Water Conservation District ("SWCD"). Chestnut Solar will continue to work with officials from the SWCD to remediate any impacts to drain tile during construction of the Facility. All civil engineering designs, which will be submitted to the Marion County Engineer and the Ohio EPA, will incorporate tiling locations to best manage surface and subsurface water. Additional information regarding the identification of field drainage systems, as well as avoidance and mitigation measures to repair potential damage, is detailed below in section 4906-4-08(E)(2)(c).

(iv) Structures used for agricultural operations

Construction of the Facility will not result in impact to or the removal of any agricultural structures.

(v) Viability as agricultural district land

There is no Agricultural District land in the Project area.

(c) Proposed Mitigation Procedures

(i) Avoidance and minimization of damage to field tile drainage systems

The locations of identified drain tiles are presented in the Drain Tile Mitigation Plan (Exhibit W). To identify these locations, Chestnut Solar solicited records from landowners on known drain tiles on their respective properties, contacted Marion Soil and Water Conservation District for County-maintained tile information, reviewed aerial photographs available on Google Earth, and studied the Project Area for evidence of drain tiles. Chestnut Solar has also begun coordination with the Marion County Engineer regarding specific Project plans. Known and discovered drain tiles will be illustrated on the final construction plan for avoidance. Drain tiles may be impacted during the construction of the Project. There are additional details regarding damage to field tile drainage systems below.

(ii) Timely repair of damaged field tile systems

Damaged drain tiles will be assessed and repaired according to the Drain Tile Mitigation Plan (Exhibit W). Due to the unmapped nature of many private drain tile systems, damage to drain tiles is likely unavoidable. Construction and operations and maintenance staff will be trained to identify potential problems with subsurface drainage by recognizing blowouts, suck holes, and suddenly occurring areas of wetness. Drain tile lines that are known or suspected

to extend outside of the Project area will be repaired by a qualified contractor. Any main tiles that impact adjacent property owners will also be modified or re-designed to incorporate those needs. All repairs are expected to take place within 30 days of discovery. Exhibit W provides additional details regarding drain tile management and a drain tile repair schematic.

(iii) Segregation of excavated topsoil, and decompaction and restoration of all topsoil to original conditions unless otherwise agreed to by the landowner

Topsoil and subsoil will be segregated throughout the Project Area. The purpose of segregation is to allow vegetation to establish quickly once construction has been completed. Topsoil segregation will also assist in agricultural production after the Facility is decommissioned. Decompaction will take place in areas where topsoil is displaced, such as in laydown yards. Gravel used for the laydown yard and any excess materials used for the temporary access roads will be removed. Upon removal, soil will be de-compacted, regraded, and stabilized with a native, low growth seed mix as described in the Landscape Plan (Exhibit C). All temporary BMPs will be removed following construction. Any construction debris will be removed from the site and disposed of properly.

Literature Cited

Air Now. 2022. Interactive Map of Air Quality. Accessed at https://gispub.epa.gov/airnow/ (Retrieved August 2022).

American Society of Civil Engineers. 2023. Accessed at https://asce7hazardtool.online/ (Retrieved January 2023).

Census Reporter. Marion County Township Population. Accessed at https://censusreporter.org/profiles/06000US3910147768-marion-township-marion-county-oh/ (Retrieved September 2022).

City of Marion https://www.marionohio.us/sites/default/files/files/citycouncil/MARION%20PART%20ELEVEN%20-%20PLANNING%20-%20ZONING.pdf

Data USA. 2022. Marion County Ohio. Accessed at https://datausa.io/profile/geo/marion-county-oh (Retrieved August 2022).

Lawrence Berkeley National Laboratory. Mark Bolinger, Joachim Seel. 2021. Utility Scale Solar, 2021 Edition Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States. Accessed at https://emp.lbl.gov/utility-scale-solar/ (Retrieved June 2022).

Lawrence, M. and P.W. Magnotta. 2018. Technical Guidance for Evaluating Selected Solar Technologies on Airports, Version 1.1. Federal Aviation Administration, Airport Planning and Environmental Division. April 2018; Original November 2010. FAA-ARP-TR-10-1. Accessed at: https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf (Retrieved June 2022).

Marion County. 2011. Marion County 2011 Land Use Plan. Accessed at: https://www.marionohioplanning.org/index.php/marion-county-2011-land-use-plan (Retrieved August 2022).

Marion County Auditor GIS Search. Accessed at: https://mcogis.co.marion.oh.us/mapping/ (Retrieved October 2022).

Mets Matters. 2023. The Beaufort Wind Force Scale. Accessed at https://www.rmets.org/metmatters/beaufort-wind-scale (Retrieved January 2023).

Ohio Department of Natural Resources. Accessed at https://geospatial.ohiodnr.gov/data-metadata/search-by-category (Retrieved May 2022).

Ohio Department of Natural Resources Division of Geological Survey (ODNR-DGS). Accessed at https://gis.ohiodnr.gov/website/dgs/karst_interactivemap/ (Retrieved August 2022).

Ohio Department of Natural Resources, Division of Geological Survey (ODNR-DGS). Accessed at https://gis.ohiodnr.gov/MapViewer/?config=Earthquakes (Retrieved August 2022).

Ohio Department of Natural Resources, Division of Wildlife. Accessed at https://ohiodnr.gov/discover-and-learn/safety-conservation/about-odnr/wildlife/documents-publications/wildlife-plants-county (Retrieved August 2022).

Ohio Environmental Protection Agency, Drinking Water Source Protection Areas. Accessed at https://oepa.maps.arcgis.com/apps/webappviewer/index.html?id=3b39e11ba7fc43c3b41801e3580e6d21 (Retrieved November 2022).

Ohio Rail Development Commission. 2021. Accessed at: https://rail.ohio.gov/wps/portal/gov/ordc/rail-in-ohio/resources/gis-mapping-tool (Retrieved August 2022).

Pleasant Township Zoning Resolution 2017. Accessed at: http://marionohioplanning.org/files/ZoningDoc/Pleasant_Township.pdf (Retrieved October 2022).

PJM. 2021. PJM Zone Map. Accessed at https://www.pjm.com/-/media/about-pjm/pjm-zones.ashx (Retrieved September 2022).

Sengupta, M., Y. Xie, A. Lopez, A. Habte, G. Maclaurin, and J. Shelby. 2018. "The National Solar Radiation Data Base (NSRDB)." *Renewable and Sustainable Energy Reviews* 89 (June): 51-60.

United States Department of Agriculture – Natural Resources Conservation Service. Accessed at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) (Retrieved July 2022).

United States Census Bureau. 2021. QuickFacts: Marion County, Ohio. Accessed at https://www.census.gov/quickfacts/marioncountyOhio (Retrieved May 2022).

U.S. Environmental Protection Agency. 2022 Environmental Justice Screening and Mapping Tool. Accessed at https://ejscreen.epa.gov/mapper/ (Retrieved January 2023).

United States Environmental Protection Agency. 2021. EPA Green Book. Accessed at https://www.epa.gov/green-book (Retrieved August 2022).

United States Environmental Protection Agency. 2022. Reviewing National Ambient Air Quality Standards (NAAQS): Scientific and Technical Information. Accessed at https://www.epa.gov/naaqs (Retrieved August 2022).

United States Department of Transportation. 2021. National Pipeline Mapping System Public Viewer. Accessed at: https://pvnpms.phmsa.dot.gov/PublicViewer/ (Retrieved August 2022).

United States Department of Transportation. 2 006. FHWA Highway Construction Noise Handbook – Construction Equipment Noise Levels and Range.

Weatherspark. 2023. Accessed at https://weatherspark.com/y/16439/Average-Weather-in-Marion-Ohio-United-States-Year-Round#Figures-WindSpeed (Retrieved February 2023).