

# Staff Report of Investigation

Hillcrest Solar Farm  
Hillcrest Solar I, LLC

Case No. 17-1152-EL-BGN

November 15, 2017



Power Siting  
Board

John R. Kasich, Governor | Asim Z. Haque, Chairman

**In the Matter of the Application of Hillcrest Solar I, LLC, for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility in Green Township, Brown County, Ohio.** )  
 )  
 ) **Case No. 17-1152-EL-BGN**  
 )

## Staff Report of Investigation

Submitted to the  
OHIO POWER SITING BOARD

BEFORE THE POWER SITING BOARD OF THE STATE OF OHIO

**In the Matter of the Application of Hillcrest Solar I, )  
LLC, for a Certificate of Environmental Compatibility )  
and Public Need to Construct an Electric Generation ) Case No. 17-1152-EL-BGN  
Facility in Green Township, Brown County, Ohio. )**

Chairman, Public Utilities Commission	Director, Department of Natural Resources
Director, Department of Agriculture	Public Member
Director, Development Services Agency	Ohio House of Representatives
Director, Environmental Protection Agency	Ohio Senate
Director, Department of Health	

To the Honorable Power Siting Board:

In accordance with the Ohio Revised Code (R.C.) 4906.07(C) and rules of the Ohio Power Siting Board (Board), the staff of the Public Utilities Commission of Ohio (Staff) has completed its investigation in the above matter and submits its findings and recommendations in this Staff Report for consideration by the Board.

The findings and recommendations contained in this report are the result of Staff coordination with the following agencies that are members of the Board: Ohio Environmental Protection Agency, the Ohio Department of Health, the Ohio Development Services Agency, the Ohio Department of Natural Resources, and the Ohio Department of Agriculture. In addition, Staff coordinated with the Ohio Department of Transportation, the Ohio Historic Preservation Office, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Federal Aviation Administration.

In accordance with R.C. 4906.07(C) and 4906.12, copies of this Staff Report have been filed with the Docketing Division of the Public Utilities Commission of Ohio and served upon the Applicant or its authorized representative, the parties of record, and pursuant to Ohio Administrative Code 4906-3-06, the main public libraries of the political subdivisions in the project area.

The Staff Report presents the results of Staff's investigation conducted in accordance with R.C. Chapter 4906 and the rules of the Board, and does not purport to reflect the views of the Board nor should any party to the instant proceeding consider the Board in any manner constrained by the findings and recommendations set forth herein.

Respectfully submitted,



Patrick Donlon  
Director, Rates and Analysis  
Public Utilities Commission of Ohio

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## **I. POWERS AND DUTIES**

### **OHIO POWER SITING BOARD**

The authority of the Ohio Power Siting Board (Board) is prescribed by Ohio Revised Code (R.C.) Chapter 4906. R.C. 4906.03 authorizes the Board to issue certificates of environmental compatibility and public need for the construction, operation, and maintenance of major utility facilities defined in R.C. 4906.01. Included within this definition of major utility facilities are: electric generating plants and associated facilities designed for, or capable of, operation at 50 megawatts (MW) or more; electric transmission lines and associated facilities of a design capacity of 100 kilovolts (kV) or more; and gas pipelines greater than 500 feet in length and more than nine inches in outside diameter, and associated facilities, designed for transporting gas at a maximum allowable operating pressure in excess of 125 pounds per square inch. In addition, pursuant to R.C. 4906.20, the Board authority applies to economically significant wind farms, defined in R.C. 4906.13(A) as wind turbines and associated facilities with a single interconnection to the electrical grid and designed for, or capable of, operation at an aggregate capacity of 5 MW or greater but less than 50 MW.

Membership of the Board is specified in R.C. 4906.02(A). The voting members include: the Chairman of the Public Utilities Commission of Ohio (PUCO) who serves as Chairman of the Board; the directors of the Ohio Environmental Protection Agency (Ohio EPA), the Ohio Department of Health, the Ohio Development Services Agency, the Ohio Department of Agriculture, and the Ohio Department of Natural Resources (ODNR); and a member of the public, specified as an engineer, appointed by the Governor from a list of three nominees provided by the Ohio Consumers' Counsel. Ex-officio Board members include two members (with alternates) from each house of the Ohio General Assembly.

### **NATURE OF INVESTIGATION**

The Board has promulgated rules and regulations, found in Ohio Administrative Code (Ohio Adm.Code) 4906:1-01 et seq., which establish application procedures for major utility facilities and economically significant wind farms.

#### **Application Procedures**

Any person that wishes to construct a major utility facility or economically significant wind farm in this state must first submit to the Board an application for a certificate of environmental compatibility and public need.<sup>1</sup> The application must include a description of the facility and its location, a summary of environmental studies, a statement explaining the need for the facility and how it fits into the Applicant's energy forecasts (for transmission projects), and any other information the applicant or Board may consider relevant.<sup>2</sup>

Within 60 days of receiving an application, the Chairman must determine whether the application is sufficiently complete to begin an investigation.<sup>3</sup> If an application is considered complete, the Board or an administrative law judge will cause a public hearing to be held 60 to 90 days after the

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1. R.C. 4906.04 and 4906.20.

2. R.C. 4906.06(A) and 4906.20(B)(1).

3. Ohio Adm.Code 4906-3-06(A).

official filing date of the completed application.<sup>4</sup> At the public hearing, any person may provide written or oral testimony and may be examined by the parties.<sup>5</sup>

### **Staff Investigation and Report**

The Chairman will also cause each application to be investigated and a report published by the Board's Staff not less than 15 days prior to the public hearing.<sup>6</sup> The report sets forth the nature of the investigation and contains the findings and conditions recommended by Staff.<sup>7</sup> The Board's Staff, which consists of career professionals drawn from the staff of the PUCO and other member agencies of the Board, coordinates its investigation among the agencies represented on the Board and with other interested agencies such as the Ohio Department of Transportation (ODOT), the Ohio Historic Preservation Office (OHPO), and the U.S. Fish and Wildlife Service (USFWS).

The technical investigations and evaluations are conducted pursuant to Ohio Adm.Code 4906-1-01 et seq. The recommended findings resulting from Staff's investigation are described in the Staff Report pursuant to R.C. 4906.07(C). The report does not represent the views or opinions of the Board and is only one piece of evidence that the Board may consider when making its decision. Once published, the report becomes a part of the record, is served upon all parties to the proceeding and is made available to any person upon request.<sup>8</sup> A record of the public hearings and all evidence, including the Staff Report, may be examined by the public at anytime.<sup>9</sup>

### **Board Decision**

The Board may approve, modify and approve, or deny an application for a certificate of environmental compatibility and public need.<sup>10</sup> If the Board approves, or modifies and approves an application, it will issue a certificate subject to conditions. The certificate is also conditioned upon the facility being in compliance with applicable standards and rules adopted under the Ohio Revised Code.<sup>11</sup>

Upon rendering its decision, the Board must issue an opinion stating its reasons for approving, modifying and approving, or denying an application for a certificate of environmental compatibility and public need.<sup>12</sup> A copy of the Board's decision and its opinion is memorialized upon the record and must be served upon all parties to the proceeding.<sup>13</sup> Any party to the proceeding that believes its issues were not adequately addressed by the Board may submit within 30 days an application for rehearing.<sup>14</sup> An entry on rehearing will be issued by the Board within 30 days and may be appealed within 60 days to the Supreme Court of Ohio.<sup>15</sup>

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4. R.C. 4906.07(A) and Ohio Adm.Code 4906-3-08.

5. R.C. 4906.08(C).

6. R.C. 4906.07.

7. Ohio Adm.Code 4906-3-06(C).

8. R.C. 4906.07(C) and 4906.10.

9. R.C. 4906.09 and 4906.12.

10. R.C. 4906.10(A)

11. R.C. 4906.10.

12. R.C. 4906.11.

13. R.C. 4906.10(C).

14. R.C. 4903.10 and 4906.12.

15. R.C. 4903.11, 4903.12, and 4906.12.

## **CRITERIA**

Staff developed the recommendations and conditions in this *Staff Report of Investigation* pursuant to the criteria set forth in R.C. 4906.10(A), which reads, in part:

The board shall not grant a certificate for the construction, operation, and maintenance of a major utility facility, either as proposed or as modified by the board, unless it finds and determines all of the following:

- (1) The basis of the need for the facility if the facility is an electric transmission line or gas pipeline;
- (2) The nature of the probable environmental impact;
- (3) That the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations;
- (4) In the case of an electric transmission line or generating facility, that the facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems and that the facility will serve the interests of electric system economy and reliability;
- (5) That the facility will comply with Chapters 3704, 3734, and 6111 of the Revised Code and all rules and standards adopted under those chapters and under sections 1501.33, 1501.34, and 4561.32 of the Revised Code. In determining whether the facility will comply with all rules and standards adopted under section 4561.32 of the Revised Code, the board shall consult with the office of aviation of the division of multi-modal planning and programs of the department of transportation under section 4561.341 of the Revised Code;
- (6) That the facility will serve the public interest, convenience, and necessity;
- (7) In addition to the provisions contained in divisions (A)(1) to (6) of this section and rules adopted under those divisions, what its impact will be on the viability as agricultural land of any land in an existing agricultural district established under Chapter 929 of the Revised Code that is located within the site and alternative site of the proposed major utility facility. Rules adopted to evaluate impact under division (A)(7) of this section shall not require the compilation, creation, submission, or production of any information, document, or other data pertaining to land not located within the site and alternative site; and
- (8) That the facility incorporates maximum feasible water conservation practices as determined by the board, considering available technology and the nature and economics of the various alternatives.



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## **II. APPLICATION**

### **APPLICANT**

The Applicant, Hillcrest Solar I, LLC, (Applicant) is owned by Blue Planet Renewable Energy, LLC, which is a joint venture partnership between MAP Royalty, Inc. (MAP) and Open Road Renewables, LLC (Open Road). MAP has invested in over 6,000 MW of wind and solar projects. Open Road, which specializes in the development of utility-scale solar projects, has developed projects in the PJM Interconnection, LLC (PJM) markets and California. MAP and Open Road have collaborated on various projects over the last six years. The Applicant plans to bid the project for construction, and select an operator from a group of reputable firms.

### **HISTORY OF THE APPLICATION**

On May 4, 2017, the Applicant filed a Pre-Application Notification Letter regarding the proposed solar electric generation project.

On May 23, 2017, the Applicant held a public informational meeting regarding the proposed solar electric generating project in Mt. Orab, Ohio.

On June 29, 2017, the Applicant filed the Hillcrest Solar Farm application.

On June 29, 2017, the Applicant filed motions for waivers from the requirements to submit the manufacturers' safety manuals or similar documents, to submit a description of its plan for test borings, and request to reduce the size of the study area regarding the impact on landmarks.

On August 3, 2017, the Administrative Law Judge (ALJ) granted in part and denied in part the Applicant's motions for waivers. Specifically, the ALJ granted the Applicant's motion for waiver from the requirement to submit the manufacturers' safety manuals or similar documents; granted, with clarification, the Applicant's motion for waiver from the requirement to submit a description of its plan for test borings; and denied the Applicant's motion for waiver from the requirement to reduce the size of the study area regarding the impact on landmarks.

On August 28, 2017, the Director of the Rates and Analysis Department of the PUCO, issued a letter of compliance regarding the application to the Applicant.

On October 17, 2017, the Ohio Farm Bureau Federation filed a motion to intervene.

On November 3, 2017, the Applicant filed a notice of modification of the project footprint.

A local public hearing has been scheduled for November 30, 2017 at 6:30 p.m. at the Countryside Inn & Suites, 100 Leninger St., Mt. Orab, Ohio 45154. The adjudicatory hearing will commence on December 14, 2017, at 10:00 a.m., on the 11<sup>th</sup> floor in Hearing Room 11-D, at the offices of the PUCO, 180 East Broad Street, Columbus, Ohio, 43215.

This summary of the history of the application does not include every filing in case number 17-1152-EL-BGN. The docketing record for this case, which lists all documents filed to date, can be found online at <http://dis.puc.state.oh.us>.

## **PROJECT DESCRIPTION**

The Applicant intends to build the Hillcrest Solar Farm as a 125 MW solar-powered generating facility in Green Township, Brown County, Ohio. The project would consist of large arrays of ground-mounted photovoltaic (PV) modules, commonly referred to as solar panels. The project also includes associated support facilities, such as access roads, up to six meteorological stations, buried electrical collection lines, inverter pads, and a substation. The proposed project area layout is shown in the map in this report.

### **Solar Panels and Racking**

The solar panels would be attached to metal racking. The racking would include piles driven or screw rotated into the ground. The solar panel arrays would be grouped in large clusters that would be fenced, with locked gates at all entrances. For equipment security and public safety, the fencing would be topped with barbed wire.

The project's arrays may use two types of racking: fixed-tilt or tracking. Fixed-tilt racking is stationary and would align the solar panel arrays to the south. Tracking arrays would run in a north-south direction and be equipped with electric motors that would slowly rotate the panels throughout the day to keep them perpendicular to the direction of sunlight. Tracking arrays would face east at sunrise, rotate westward during the day, face west at sunset, and then reset to the east.

The Applicant has not yet selected the final solar panel technology to be utilized for this project, but has limited its consideration to two commonly used solar panel technologies that are substantially similar in design: crystalline or thin-film. Both racking systems would accommodate either crystalline or thin-film solar panel modules. According to the Applicant, crystalline modules are more efficient but cost more to manufacture than thin-film modules. Both solar panel technologies are comparable, and the Applicant plans to submit the final project designs to the Board for review prior to construction.

The Applicant has not selected the specific module vendor, but indicated that it intends to use a manufacturer that has the capability and experience to provide approximately 475,000 modules for this project.

### **DC Collector System, Inverters, and AC Collector System**

The Applicant would create a collector system made up of a network of electric and communication lines that would transmit the electric power from the solar arrays to a central location.

The electricity from the solar panels is generated in direct current (DC). DC power from the solar panels would be delivered to circuits, which would be routed through cable trays, then to combiner boxes. Power from the combiner boxes would be transmitted to groups of components, collectively called an inverter, which would include a DC-to-alternating current (AC) inverter, a step-up transformer that increases the voltage to 34.5 kV, and a cabinet containing power control electronics. The facility would include approximately 90 inverters.

Each inverter would then deliver AC power to a common substation through a system of buried electric lines and associated communication lines. The Applicant intends for each portion of the AC collector system to originate in one of the solar fields and terminate at the substation. The Applicant has committed that those portions of the AC collector system outside the fenced solar

fields and fenced substation would be buried at least 36 inches below grade. The Applicant will use warning tape and register the underground facilities with Ohio Utilities Protection Service.

### **Substation and Transmission Line**

The facility substation would be located on a three-acre parcel of land adjacent to and east of the existing Duke Energy Hillcrest substation. The major components of the Applicant's substation would be collection line feeders and breakers, a 34.5 kV bus, a main power transformer that steps up the voltage to 138 kV, a high-voltage breaker, metering/relaying transformers, disconnect switches, equipment enclosure containing power control electronics, and a lightning mast.

A short 138 kV transmission line would connect the project substation to the existing Duke Energy Hillcrest substation. The transmission line would be approximately 1,000 feet in length, and would be constructed almost entirely below grade on property owned by Duke Energy. It would be routed under the existing 345 kV transmission line and connect to the north side of the Duke Energy substation. A dead-end structure would be used where the circuit changes from a buried cable to an above ground line prior to entering the Applicant's substation. The transmission line and dead-end structure would be the subject of a separate filing to be submitted to the Board.

### **Roads**

The Applicant indicates that it would use up to 26.4 miles of access roads for construction, operation, and maintenance of the solar farm. The access roads would consist of aggregate material and/or grass. The access roads would be up to 25 feet wide during construction and then reduced to 20 feet wide during operation.

### **Meteorological Stations**

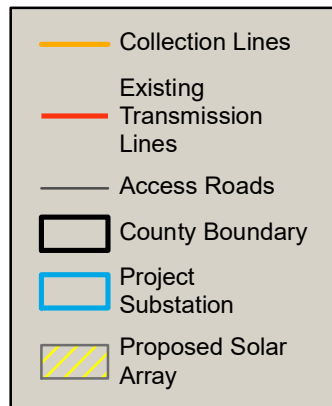
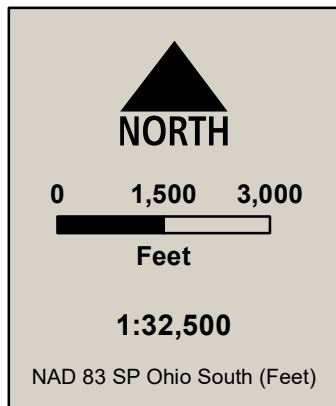
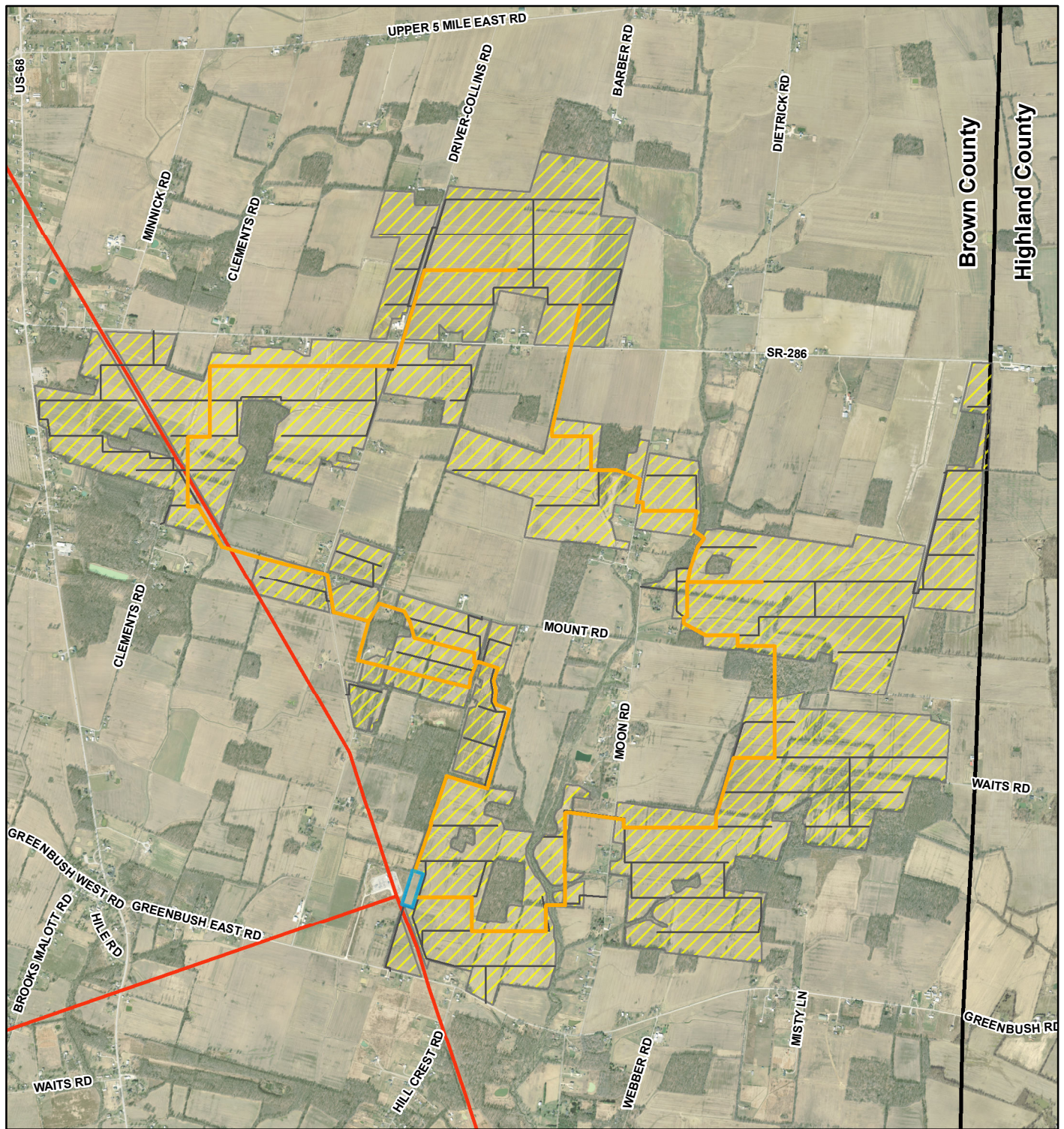
The project would include up to six solar meteorological stations that would be up to 15 feet tall, and fenced/gated. The meteorological stations would include pyranometers, which measure the solar resource. Meteorological stations would typically include an anemometer, a wind vane, a barometer, a rain gauge, a thermometer, and communications equipment.

### **Project Schedule**

The Applicant expects to finalize design of the solar farm in the first quarter of 2018. The Applicant intends to start construction in April 2018 and complete construction in December 2018. The Applicant stated that delays that extend the in-service date beyond December 2019 could jeopardize the owner's eligibility for the federal investment tax credit.

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## Overview Map

### 17-1152-EL-BGN

#### Hillcrest Solar Farm

*Maps are presented solely for the purpose of providing a visual representation of the project in the staff report, and are not intended to modify the project as presented by the Applicant in its certified application and supplemental materials.*

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### **III. CONSIDERATIONS AND RECOMMENDED FINDINGS**

In the Matter of the Application of Hillcrest Solar I, LLC, for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility in Green Township, Brown County, Ohio, Staff submits the following considerations and recommended findings pursuant to R.C. 4906.07(C) and 4906.10(A).

#### **Considerations for R.C. 4906.10(A)(1)**

##### **BASIS OF NEED**

Pursuant to R.C. 4906.10(A)(1), the Board must determine the basis of the need for the facility only if the facility is an electric transmission line or gas pipeline. Staff has found this inapplicable to this application.

#### **Recommended Findings**

Staff recommends that the Board find that the basis of need as specified under R.C. 4906.10(A)(1) is not applicable to this proposed electric generating facility, because the facility is neither an electric transmission line nor a gas pipeline.



## **Considerations for R.C. 4906.10(A)(2)**

### **NATURE OF PROBABLE ENVIRONMENTAL IMPACT**

Pursuant to R.C. 4906.10(A)(2), the Board must determine the nature of the probable environmental impact of the proposed facility. Staff submits the following considerations with regard to the nature of the probable environmental impact.

#### **Socioeconomic Impacts**

##### *Demographics*

The proposed facility is located in Brown County, and borders the western edge of Highland County. In 2010, the population of Brown County was 44,846, and the population density was 91.5 persons per square mile.<sup>16</sup> For context, the 2010 population of Ohio was 11,536,725, and the population density was 282.3 per square mile. The population of Brown County is projected to increase by approximately two percent by 2020.<sup>17</sup>

##### *Land Use*

The facility would consist of solar arrays, material staging areas, a project substation, meteorological stations, access roads, and collector lines. The Applicant proposes to construct the facility on up to 1,100 acres of privately-owned land within a larger area of approximately 2,083 acres, comprised of over thirty separate properties. Of these 2,083 acres, approximately 86 percent is presently used for various agricultural purposes, and three percent are used for residential purposes and open space (lawn areas). Approximately 10 percent of the project area contains woodlots.

The majority of land that would be used for the project is currently agricultural. There are 111 residences located within 1,000 feet of the project boundary. According to the Applicant, 11 non-participating residences, which are homes located on parcels that are not being leased by the Applicant for the project, are located within 100 feet of potential solar arrays. However, the Applicant states that there would be a self-imposed 100-foot setback between any aboveground equipment within a solar array and any habitable residence located on a non-participating parcel. Additionally, no residential structures would be removed for this project. The project area does not include any population centers or major industries. There is one facility utilized as a place of worship located directly adjacent to the project.

Staff recommends that the Applicant limit the hours of construction and have a complaint resolution plan in place to address potential construction and operational related concerns from nearby residents. Additionally, Staff recommends that the Applicant minimize aesthetic impact of the facility to nearby residences through vegetative screening, alternate fencing, or other measures subject to staff review, where appropriate.

There are no state parks, heritage areas, state forests, national wildlife refuges, national park service lands, national natural landmarks, state nature preserves, scenic byways, or state historic

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16. United States Census Bureau, "State and County Quick Facts: Brown County, OH," accessed October 3, 2017, <https://www.census.gov/quickfacts/fact/table/browncountyohio,US/PST045216>.

17. *In the matter of the Application of Hillcrest Solar I, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generating Facility in Green Township, Brown County, Ohio*, Case No. 17-1152-EL-BGN, Application at Exhibit D, p. 3 (Application) (June 29, 2017).

markers located within five miles of the project. The Indian Creek Wildlife Area, Grant Lake Wildlife Area, both of which are parks within the village of Mt. Orab, a golf course, the Buckeye Trail, and the North County National Scenic Trail are all located within five miles of the project, but not within two miles of the project. The project would not be visible from these areas due to its low profile.

### *Regional Planning*

The project site is located within Green Township in Brown County. Neither Green Township nor Brown County have adopted comprehensive land use plans. Neighboring counties that are located within the five-mile study radius for this project include Highland County and Clermont County. Respective land use plans for these counties are contained in the *2003 Highland County Comprehensive Plan* (Highland Plan), and the *2014 Clermont County Comprehensive Plan* (Clermont Plan). The Applicant states that land use recommendations in the Highland Plan emphasize maintaining rural character and agricultural uses and limiting the sprawl of development and curb cuts on county roadways. The Clermont Plan emphasizes economic development. The proposed solar farm would not interfere with the land use plans of either nearby county.

### *Cultural Resources*

The Applicant enlisted a consultant to complete a cultural resources records review for an area within two miles of the project. This review was based on data provided by the OHPO's online mapping, as well as other map collections and resources. The consultant found that four Phase I archaeological surveys had previously been performed within the two-mile project study area.

From the literature review, the Applicant identified one cultural resource listed in the National Register of Historic Places (NRHP) within the study area. This resource is a farmhouse (Hirons-Brown House), which is located just over one mile southeast of the project area and is also listed as an Ohio Historic Inventory (OHI) site.

The Applicant also identified six Ohio Archaeological Inventory (OAI) sites from the literature review. The OAI sites are listed as archaeologically significant sites. These sites are located predominately between one and two miles of the project area, and none are located directly within the project area. Additionally, there are 10 mapped cemeteries located within two miles of the project area.

The literature review revealed no known archaeological sites at the project area as proposed by the Applicant. The location of the post footprints, access roads, and electric collection lines does not appear to directly impact OHI and OAI sites.

The Applicant's cultural resources consultant stated that there would be no direct impacts to above ground cultural resources (cemeteries or historic structures) from construction of the project. No structures or inhabited dwellings, NRHP-listed or otherwise, would be removed as part of this project. There are numerous prehistoric earthworks in Brown and Highland county, none of which were identified within the project area.

The consultant further recommends that a limited archaeological survey be conducted for those portions of the project where substantial, direct ground disturbance is proposed. As of the writing of this report, the Applicant was in the process of designing a systematic Phase I survey program

for the project in conjunction with input from the OHPO. Staff concurs that a Phase I study should be performed for both archaeological and architectural resources near this project in order to ensure minimal impacts. The Phase I study would examine the extent of known resources and establish criteria for further study of cultural resources in the project area should any unexpected discovery during construction be found.

### *Aesthetics*

The tallest structure for this project would be the lightning mast that would be located within the project substation. The new project substation would be located adjacent to an existing Duke Energy substation. While the new substation would be visible from certain locations, its presence at this site would be consistent with surrounding land use. Therefore, any incremental aesthetic impact from the project would be minimal.

The highest elevation of the solar panels would be 15 feet above ground level. Based on the results of the Applicant's Visual Resource Assessment (VRA), the solar panels are not likely to be visible at locations beyond two miles from the perimeter of the project.

The impact of viewing the solar panels is subjective and likely to vary by receptor. The VRA notes that, due to the low profile of the project combined with vegetation in the area, the number of locations from which the project would be visible are limited and would be greater the closer the viewer is to the infrastructure itself. Steps taken to minimize the visibility of the project would include fencing and using minimal lighting necessary to satisfy safety requirements. Due to the potential impacts on non-participating residences surrounding the facility, Staff recommends the Applicant incorporate a landscape and aesthetics plan to reduce impacts in areas where an adjacent non-participating parcel contains a residence with a direct line of sight to the project area. Staff recommends that aesthetic impact mitigation could include native vegetative plantings, alternate fencing, good neighbor agreements, or other methods subject to staff review.

### *Glare*

Glare is the phenomenon where sunlight reflects from a surface (in particular solar panels) to create a duration of bright light.<sup>18</sup> The potential impacts of glare from solar panels could be a brief loss of vision, a safety risk to pilots, and nuisance to neighbors, amongst other impacts.

The Applicant finds that the nearest public use airport, Brown County Municipal Airport (GEO), is approximately 15 miles from the project area. The Applicant asserts that the Hillcrest Solar Farm would not be visible to pilots making final approaches to the Brown County Municipal Airport. To minimize glare, the Applicant has committed to select solar panels with an anti-glare coating. Also, the Applicant is still considering using a tracking array system which would reduce the area to which light is reflected. Both of these measures would maximize the amount of solar energy that the panels capture, which reduces the potential for glare.

In accordance with R.C. 4906.10(A)(5), Staff contacted the ODOT Office of Aviation during the review of this application in order to coordinate review of potential impacts of the facility on local airports. The ODOT Office of Aviation staff has stated that it is likely this proposed solar farm will not be an airspace permit issue, and that the glare analysis conducted by the Applicant was satisfactory.

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18. Glare also encompasses glint, which is a momentary flash of bright light.

Staff notes that the recommended aesthetic impact mitigation, which can include native vegetative plantings, good neighbor agreements, or other mitigation methods, would also reduce the potential impact from glare.

## **Economics**

The Applicant's consultant prepared an economic analysis of the construction and operation impacts to the study area, which includes 15 municipalities in Brown, Highland, and Clermont counties.<sup>19</sup> The analysis estimated that:

- The project could create 644 on-site construction jobs and 17 jobs annually during operation;
- Wages, during the construction period, would produce \$43.3 million in impacts to the study area, and operations would add an annual impact of \$1 million;
- The construction phase would add a total impact of \$64.3 million to the Brown County area;
- The project is expected to be operational in 2018 and is expected to meet all requirements set forth for a Payment in Lieu of Taxes (PILOT) program. The taxing authorities are located in Green Township and Western Brown Local School District within Brown County. The Applicant estimates that a resulting arrangement with Brown County would produce PILOT revenues of \$875,000 to \$1.163 million annually.

The Applicant filed additional detail on the economic data, including the applicable capital and intangible costs plus the estimated annual operation and maintenance costs, under seal.

The Applicant's economic data meets the requirements set forth in Ohio Adm.Code 4906-4-06.

All Staff recommendations for the requirements discussed in this section of the *Staff Report of Investigation* are included under the **Socioeconomic Conditions** heading of the Recommended Conditions of Certificate section.

## **Ecological Impacts**

### *Geology and Seismology*

The bedrock that underlies Brown County is hard fossiliferous limestone and soft, gray shale deposited more than 400 million years ago. Deposits of glacial till cover the bedrock over the most of the county. This till material is made up of a very compact mix of sand, gravel, and boulders and has a very high content of lime. The project site is in a broad and flat lying area with very little relief.

Brown County has a limited history of seismic activity. In 1957, an earthquake with a magnitude 2.9 on the Richter scale occurred in southeast Brown County. The epicenter was marked just off the banks to the Ohio River. The other recorded seismic events occurred 15 miles or more from the project site to the east in Highland County and to the west in Clermont County in the late 1800s. These seismic events all registered below 3.0 in magnitude. The Applicant does not anticipate that future seismic activity would pose a hazard to the design and construction of this solar facility.

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19. Application at Exhibit D.

There are no active or abandoned surface or underground mines within the project area. Staff finds that the geology of Brown County does not present conditions that would limit or negatively impact the construction or future operation of this solar facility.

### *Soils and Test Borings*

The soils in the project area, as characterized in the Soil Survey of Brown County, Ohio, generally consist of silt loam and silty clay loam. The Clermont-Avonburg Association is the major soil association in the northern part of Brown County, including the project area. The Clermont silt loam, zero to one percent slopes, is the most dominant soil unit mapped in the project area. It is a deep, nearly level, poorly drained soil. The depth to bedrock ranges from 40 to 90 feet. Slopes are less than two percent.

The Applicant stated that it would perform soil testing at representative sites at the solar array location. The borings would extend to the proposed foundation depth within the soil subsurface or to competent bedrock, whichever is encountered first. The Applicant stated that it will provide Staff a detailed geotechnical report of the borings and laboratory testing, along with recommendations on construction methods and foundation design.

The Applicant would implement best management practices (BMP) as necessary to control surface water runoff and erosion to ensure, during and after construction, the long-term stability of the solar facility. Ponding, frost action, seasonal wetness, low bearing capacity, and moderately slow permeability are conditions that can be limiting factors for this particular soil. For this particular facility, the construction involves shallow depths and light bearing loads. Thus, these limitations should not adversely affect or restrict the construction or operation of this solar facility.

### *Surface Waters*

The Applicant delineated 42 streams within the project area. Seven streams would be impacted by open-cut collection line installation, including two perennial streams and five intermittent streams, impacting up to 82.5 linear feet. Construction of access roads would require up to 30 stream crossings totaling 390 linear feet. This includes 18 individual streams with some crossed multiple times. Of these 18 individual streams, six are perennial, eight are intermittent, and four are ephemeral. Most of the water resource impacts would be limited to impacts on manmade agricultural or roadside ditches.

The Applicant delineated six wetlands within the project area. Wetland impacts would be limited to one access road crossing of a Category 1 wetland. Wetland impacts would total approximately 0.01 acre.

No ponds or lakes would be impacted by the facility during construction or operation.

To minimize surface water impacts, the Applicant would install many of the electric collection lines using horizontal directional drilling (HDD). The Applicant has a detailed frac-out contingency plan that would be employed during construction.

The Applicant is currently coordinating with the Ohio EPA and the U.S. Army Corps of Engineers (USACE) to ensure that all anticipated wetland and stream impacts are properly permitted. The Applicant anticipates coverage under the USACE Nationwide Permit 51 for proposed impacts to surface water resources.

The Applicant would take additional measures to reduce water quality impacts through the development of a Storm Water Pollution Prevention Plan (SWPPP), as part of the Ohio EPA National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge associated with construction activities, to help control potential sedimentation, siltation, and run-off. No proposed facility components are within the 100-year floodplain.

### *Threatened and Endangered Species*

The Applicant requested information from the ODNr and the USFWS regarding state and federal listed threatened or endangered plant and animal species. Staff gathered additional information through field assessments and review of published ecological information. The following table provides the results of the information requests, field assessments, and document review.

MAMMALS				
Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
Indiana bat	<i>Myotis sodalis</i>	Endangered	Endangered	Historical range includes the project area.
northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	N/A	Historical range includes the project area.
BIRDS				
Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
loggerhead shrike	<i>Lanius ludovicianus</i>	N/A	Endangered	Historical range includes the project area. Suitable nesting habitat includes hedgerows, thickets, and fencerows.
MUSSELS				
Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
sheepnose	<i>Plethobasus cyphus</i>	Endangered	Endangered	Historical range includes the project area.
fanshell	<i>Cyprogenia stegaria</i>	Endangered	Endangered	Historical range includes the project area.
pink mucket	<i>Lampsilis orbiculata</i>	Endangered	Endangered	Historical range includes the project area.
rayed bean	<i>Villosa fabalis</i>	Endangered	Endangered	Historical range includes the project area.
snuffbox	<i>Epioblasma triquetra</i>	Endangered	Endangered	Historical range includes the project area.
ebonyshell	<i>Fusconaia ebena</i>	N/A	Endangered	Historical range includes the project area.
little spectaclecase	<i>Villosa lienosa</i>	N/A	Endangered	Historical range includes the project area.
butterfly	<i>Ellipsaria lineolata</i>	N/A	Endangered	Historical range includes the project area.
washboard	<i>Megaloniais nervosa</i>	N/A	Endangered	Historical range includes the project area.
elephant-ear	<i>Elliptio crassidens crassidens</i>	N/A	Endangered	Historical range includes the project area.

### MUSSELS

Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
Ohio pigtoe	<i>Pleurobema cordatum</i>	N/A	Endangered	Historical range includes the project area.
monkeyface	<i>Quadrula metanevra</i>	N/A	Endangered	Historical range includes the project area.
wartyback	<i>Quadrula nodulata</i>	N/A	Endangered	Historical range includes the project area.
yellow sandshell	<i>Lampsilis teres</i>	N/A	Endangered	Historical range includes the project area.
fawnsfoot	<i>Truncilla donaciformis</i>	N/A	Threatened	Historical range includes the project area.
threehorn wartyback	<i>Obliquaria reflexa</i>	N/A	Threatened	Historical range includes the project area.

### FISH

Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
northern madtom	<i>Noturus stigmosus</i>	N/A	Endangered	Historical range includes the project area. Potentially located in perennial streams within the project area.
mountain madtom	<i>Noturus eleutherus</i>	N/A	Threatened	Historical range includes the project area. Potentially located in perennial streams within the project area.
goldeye	<i>Hiodon alosoides</i>	N/A	Endangered	Historical range includes the project area. Potentially located in perennial streams within the project area.
shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>	N/A	Endangered	Historical range includes the project area. Potentially located in perennial streams within the project area.
bigeye shiner	<i>Notropis boops</i>	N/A	Threatened	Historical range includes the project area. Potentially located in perennial streams within the project area.
river darter	<i>Percina shumardi</i>	N/A	Threatened	Historical range includes the project area. Potentially located in perennial streams within the project area.
channel darter	<i>Percina copelandi</i>	N/A	Threatened	Historical range includes the project area. Potentially located in perennial streams within the project area.
paddlefish	<i>Polyodon spathula</i>	N/A	Threatened	Historical range includes the project area. Potentially located in perennial streams within the project area.

INSECTS				
Common Name	Scientific Name	Federal Status	State Status	Presence in Project Area
Kramer's cave beetle	<i>Pseudanophthalmus krameri</i>	N/A	Endangered	Historical range includes the project area. Impacts not anticipated.
Ohio cave beetle	<i>Pseudanophthalmus ohioensis</i>	N/A	Endangered	Historical range includes the project area. Impacts not anticipated.

The Applicant did not identify any listed plant or animal species during field surveys. Further, the ODNR and the USFWS did not identify any concerns regarding impacts to listed plant species. In the unexpected event that the Applicant encounters listed plant or animal species during construction, Staff recommends that the Applicant contact Staff, the ODNR, and the USFWS, as applicable. Staff also recommends that if the Applicant encounters any listed plant or animal species prior to construction, the Applicant include the location and how impacts would be avoided in the final access plan to be provided to Staff.

The project area is within the range of state and federal endangered Indiana bat (*Myotis sodalis*) and the federal threatened northern long-eared bat (*Myotis septentrionalis*). As tree roosting species in the summer months, the habitat of these species may be impacted by the project. In order to avoid impacts to the Indiana bat and northern long-eared bat, Staff recommends the Applicant adhere to seasonal tree cutting dates of October 1 through March 31 for all trees three inches or greater in diameter, unless coordination efforts with the ODNR and the USFWS reflects a different course of action.

The project is within the range of several state listed fish species, including the northern madtom, mountain madtom, goldeye, shovelnose, sturgeon, bigeye shiner, river darter, channel darter, and paddlefish. The ODNR Division of Wildlife (DOW) recommends no in-water work in perennial streams from April 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. The Applicant currently proposes to open cut several perennial streams along both routes. If in-water work in perennial streams cannot be avoided, Staff concurs with the DOW recommendation that no in-water work occur in perennial streams from April 15 through June 30.

The project is within the range of the state endangered loggerhead shrike. Suitable nesting habitat for this species includes hedgerows, thickets, and fencerows. The Applicant has proposed to remove this habitat type during construction. In order to avoid impact to this species the ODNR recommends that this habitat not be cleared during the species' nesting period of April 1 through August 1.

The ODNR stated that this project must not have an impact on freshwater native mussels at the project site. Following its review, the Applicant confirmed that the project would not impact any of the streams described in the ODNR comments and the project does not contain suitable habitat for mussel species.

### *Vegetation*

The following table reflects the different vegetative communities present in the project area and associated impact for the facility.



VEGETATION			
Vegetation Community Type	Temporary Disturbance (Acres)	Permanent Loss (Acres)	Total Disturbance (Acres)
Forestland	0	43	43
Wetlands	0	0.01	0.01
Agricultural Lands	62	1772	1834
Total	62	1815	1877

The estimated vegetative impact includes the entire project area presented within the application. However, the entire project area would not be developed as part of this project. As a result, permanent impacts associated with this project would be under 1,100 acres. Permanent vegetative impacts would occur primarily within agricultural fields. The Applicant has indicated that the estimated impact to forestland of 43 acres is the result of geographic information system (GIS) calculations and actual forest clearing would be far less. The Applicant has committed to minimizing tree clearing within the project area to the maximum extent practicable.

Additionally, the final design of the project would include the planting and maintenance of pollinator-friendly, native plantings in selected locations along the outside border of the solar fields. These features not only would enhance the visual appeal of the project, but would enrich local wildlife habitat and benefit the local farming community. Pollinator-friendly plantings would help reduce erosion; reduce fertilizer, herbicide, and pesticide use; discourage invasive species; and improve water quality.

Staff recommends that the Applicant be required to provide a vegetation management plan for review prior to the preconstruction conference.

All Staff recommendations for the requirements discussed in this section of the *Staff Report of Investigation* are included under the **Ecological Conditions** heading of the Recommended Conditions of Certificate section.

## **Public Services, Facilities, and Safety**

### *High Winds*

The Applicant does not expect its components would be susceptible to damage from high winds. The Applicant intends to install all project equipment to avoid any adverse impact from winds.

### *Public Services, Traffic, Roads, and Bridges*

The principal impact on public services would be minimal increases in traffic on routes leading to the project area. Some traffic management during the construction phase may be necessary in the immediate vicinity of the project area to ensure safe and efficient maintenance of existing traffic patterns and usages. The Applicant has committed to coordinating with local officials to ensure that impacts associated with the increase in traffic would be minimal.

During operation, facility related traffic would be minimal and would not be expected to significantly impact local roadways. Potential emergency service requirements would be coordinated with local officials during construction and operation.

Due to the location of the project, the Applicant anticipates that components for the entire project would be delivered by truck. The transportation management plan would be finalized once the engineering layout is determined.

Staff recommends a requirement for the Applicant to develop a final transportation management plan that would include a road use agreement. Any damaged public roads and bridges would be repaired promptly to their previous condition by the Applicant under the guidance of the appropriate regulatory agency. Any temporary improvements would be removed unless the appropriate regulatory agency requests that they remain in place.

### *Noise*

Noise impacts from construction activities would include site clearing, installation of mechanical and electrical equipment, and commissioning and testing of equipment. Many of the construction activities would generate significant noise levels during the 10 months of construction. However, the adverse impact of construction noise would be temporary and intermittent, would occur away from most residential structures, and would be limited to daytime working hours. The Applicant would use equipment mitigation practices such as maintaining engines and mufflers in good operating order, and limiting construction activities to 7:00 a.m. to 7:00 p.m., or until dusk when sunset occurs after 7:00 p.m.

Operational noise impacts for a solar generation facility would be small and occur only during the day. Operational noise sources would be limited to solar panel tracking motors, which allow the solar panels to track the sun to maximize generation, inverters located within a group of solar panels, and the step up transformer at the new substation. The sound from the tracking motors and inverters is not expected to be heard outside a distance of 50 to 150 feet.

The Applicant conducted a background ambient noise level study in order to understand the existing noise levels near the proposed facility. The largest operational noise impacts would be from the step up transformer at the new substation. The noise study has shown that, at the closest residence, the transformer may occasionally cause the noise level to be around three decibels higher than the highest recorded ambient noise levels. Therefore, the project would be expected to have minimal adverse noise impacts on the adjacent community.

All Staff recommendations for the requirements discussed in this section of the *Staff Report of Investigation* are included under the **Public Services, Facilities, and Safety Conditions** heading of the Recommended Conditions of Certificate section.

### **Recommended Findings**

Staff recommends that the Board find that the Applicant has determined the nature of the probable environmental impact for the proposed facility, and therefore complies with the requirements specified in R.C. 4906.10(A)(2), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this *Staff Report of Investigation* entitled Recommended Conditions of Certificate.

## **Considerations for R.C. 4906.10(A)(3)**

### **MINIMUM ADVERSE ENVIRONMENTAL IMPACT**

Pursuant to R.C. 4906.10(A)(3), the proposed facility must represent the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, along with other pertinent considerations.

#### **Site Selection**

The project area was chosen because southwestern Ohio provides some of the best solar resource in the state. The individual site locations were favored due to the proximity to the utility substation that was selected as the point of interconnection. Close proximity to an interconnection substation is an important criterion for siting generation facilities like this because it allows the Applicant to inject substantial new generation without extensive and costly upgrades to the transmission system. Siting the project this close to the existing substation reduces the length of the new transmission line between the solar facility substation and the existing transmission system substation, which reduces the potential electrical losses associated with collecting the power distant from the point of interconnection.

The Applicant determined the specific location of the facility components by using the following four criteria: (1) land needed to be relatively level, previously disturbed, and dry; (2) land to be used for the project be contiguous to or in proximity to other, similarly suitable parcels; (3) it was important and appropriate to minimize impacts to sensitive features such as streams, wetlands, and potential wildlife habitat; and property owners' decisions on whether to lease land for solar panels and other components of the project.

#### **Minimizing Impacts**

The Applicant has sited and designed the project to minimize potential impacts. Of the approximately 2,100 acres of leased land, approximately 1,100 acres would be occupied by permanent facilities. Agricultural land accounts for approximately 83 percent of all land that would be impacted by the proposed facility.

Relatively few previously recorded cultural resources were identified in the immediate vicinity of the project. The Applicant is currently in the process of designing a systematic Phase I survey program for the project, in conjunction with input from the OHPO, to assure impacts to cultural resources are minimized.

The proposed facility would have an overall positive impact on the local economy due to the increase in construction spending, wages, purchasing of goods and services, annual lease payments to the local landowners, and potential PILOT revenue. The Applicant estimates that the results of a forthcoming arrangement with Brown County would produce annual PILOT revenue of \$875,000 to \$1.163 million for the surrounding communities and school district.

To minimize impacts to wetlands and streams, the Applicant has committed to using HDD to install the underground electric collection cable under most streams and wetlands, where possible. Construction of the facility would not require work within mapped 100-year floodplains.

Impacts to any state and federal listed species can be avoided by following seasonal restrictions for construction in certain habitat types, as detailed by the USFWS and the ODNR.

Noise impacts are expected to be primarily limited to construction activities. The adverse impact of construction noise would be temporary and intermittent, would occur away from most residential structures, and would be limited to daytime working hours.

During the construction period, local, state, and county roads would experience a temporary increase in truck traffic due to deliveries of equipment and materials. A final delivery route plan and road use agreement would be developed through discussions with local officials.

Due to the low profile of the project combined with vegetation in the area, the visual impacts would be most prominent to landowners in the immediate vicinity of the facility. Through measures committed to by the Applicant, as well as the landscape and aesthetics plan recommended by Staff, aesthetic impacts would be minimized.

### **Conclusion**

Staff concludes that the proposed project would result in both temporary and permanent impacts to the project area and surrounding areas. Due to the nature of potential impacts to land use, cultural resources, surface water resources, wildlife, and Staff's recommended conditions to further mitigate these impacts, Staff concludes that the project represents the minimum adverse environmental impact.

### **Recommended Findings**

Staff recommends that the Board find that the proposed facility represents the minimum adverse environmental impact, and therefore complies with the requirements specified in R.C. 4906.10(A)(3), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this *Staff Report of Investigation* entitled Recommended Conditions of Certificate.

## **CONSIDERATIONS FOR R.C. 4906.10(A)(4)**

### **ELECTRIC GRID**

Pursuant to R.C. 4906.10(A)(4), the Board must determine that the proposed electric facilities are consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facilities will serve the interests of electric system economy and reliability.

The purpose of this section is to evaluate the impact of integrating the proposed facility into the existing regional electric transmission grid. The Applicant proposes to construct a solar photovoltaic generating facility located in Brown County, capable of producing 125 MW. The proposed facility would interconnect to Duke Energy's Hillcrest 138 kV Substation.

#### **NERC Planning Criteria**

The North American Electric Reliability Corporation (NERC) is responsible for the development and enforcement of the federal government's approved reliability standards, which are applicable to all owners, operators, and users of the bulk power system (BPS). As an owner, operator, and/or user of the BPS, the Applicant is subject to compliance with various NERC reliability standards. NERC reliability standards are included as part of the system evaluations conducted by PJM.<sup>20</sup>

#### **PJM**

The Applicant submitted its generation interconnection request for the proposed facility to PJM on June 8, 2015. PJM gave the application a queue position of AB1-014. The System Impact Study (SIS) was released by PJM in September 2016.<sup>21</sup>

PJM studied the interconnection as an injection into Duke Energy's electric grid via the Hillcrest 138 kV substation. The Applicant requested an injection of 125 MW, of which 47.5 MW could be available in the PJM capacity market. The capacity market ensures the adequate availability of necessary generation resources can be called upon to meet current and future demand.

#### **PJM Network Impacts**

PJM analyzed the bulk electric system with the proposed facility interconnected to the BPS. A 2019 summer peak power flow model was used to evaluate the regional reliability impacts. The studies revealed no reliability problems. The below chart displays the results of the PJM SIS for the PJM regional footprint.<sup>22</sup>

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20. PJM Interconnection, LLC is the regional transmission organization charged with planning for upgrades and administering the generation queue for the regional transmission system in Ohio. Generators wanting to interconnect to the bulk electric transmission system located in the PJM control area are required to submit an interconnection application for review of system impacts. The interconnection process provides for the construction of expansions and upgrades of the PJM transmission system, as needed to maintain compliance with reliability criteria with the addition of generation in its footprint.

21. PJM Interconnection, LLC, "System Impact Study, Queue Number AB1-014," accessed October 13, 2017, <http://pjm.com/planning/generation-interconnection/generation-queue-active.aspx>.

22. PJM Interconnection, LLC, "System Impact Study, Queue Number AB1-014," accessed October 13, 2017, <http://pjm.com/planning/generation-interconnection/generation-queue-active.aspx>.

<b>PJM REGIONAL SYSTEM IMPACTS</b>	
<b>Generator Deliverability - System Normal &amp; Single Contingency Outage</b>	
<i>Plant Output: Capacity Level – 47.5 MW</i>	No problems identified
<b>Category C and D - Multiple Contingency Outages</b>	
<i>Plant Output: 125 MW</i>	No problems identified

### **Contribution to Previously Identified Overloads - Network Impacts**

PJM studied overloading where the proposed facility may affect earlier projects in the PJM Queue.

<b>CONTRIBUTION TO PREVIOUSLY IDENTIFIED OVERLOADS</b>	
<i>Plant Output: 125 MW</i>	No problems identified

### **Potential Congestion due to Local Energy Deliverability- Energy Delivery Impacts**

PJM studied the delivery of the energy portion. Network upgrades under this section would allow for the delivery of energy with operational restrictions. The upgrades are at the discretion of the Applicant.

<b>POTENTIAL CONGESTION DUE TO LOCAL ENERGY DELIVERABILITY</b>	
<i>Plant Output: Capacity Level – 47.5 MW Energy Level – 125 MW</i>	No problems identified

### **Short Circuit Analysis**

The short circuit analysis study, which is part of the SIS, evaluates the interrupting capabilities of circuit breakers that would be impacted by the proposed generation addition. The results identified no circuit breaker problems.

### **Conclusion**

PJM analyzed the bulk electric system, with the facility interconnected to the transmission grid, for compliance with NERC reliability standards and PJM reliability criteria. The PJM system studies indicated that no reliability violations would occur during single and multiple contingencies. In addition, no violations were found during the short circuit analysis.

The facility would serve the public interest, convenience, and necessity by providing additional electrical generation to the regional transmission grid, would be consistent with plans for expansion of the regional power system, and would serve the interests of electric system economy and reliability.

### **Recommended Findings**

Staff recommends that the Board find that the proposed facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facility would serve the interests of electric system economy and reliability. Therefore, Staff recommends that the Board find that the facility complies with the

requirements specified in R.C. 4906.10(A)(4), provided that any certificate issued by the Board for the proposed facilities include the conditions specified in the section of this *Staff Report of Investigation* entitled Recommended Conditions of Certificate.

## **Considerations for R.C. 4906.10(A)(5)**

### **AIR, WATER, SOLID WASTE, AND AVIATION**

Pursuant to R.C. 4906.10(A)(5), the facility must comply with Ohio law regarding air and water pollution control, withdrawal of waters of the state, solid and hazardous wastes, and air navigation.

#### **Air**

Air quality permits are not required for construction of the proposed facility. However, fugitive dust rules adopted under R.C. Chapter 3704 may be applicable to the construction of the proposed facility. The Applicant would minimize dust generated by minimizing grading and earthmoving activities. The Applicant would also control fugitive dust by using water and/or dust suppressants on unpaved roads as needed.

This project would not include any stationary sources of air emissions and, therefore, would not require air pollution control equipment.

#### **Water**

Neither construction nor operation of the proposed facility would require significant amounts of water, so requirements under R.C. 1501.33 and 1501.34 are not applicable to this project. The project would not generate any wastewater and therefore would have no wastewater-related impacts on water quality due to the construction and operation of the project. Water quality monitoring would not be necessary for pre-construction surveys and wastewater discharge permits would not be required.

The Applicant would seek certain water protection-related permits. First, the project is expected to require a number of nationwide permits issued by the USACE under Section 404 of the federal Clean Water Act (33 U.S.C. 1344) for crossings of certain waters of the United States. Second, in connection with those nationwide permits, the Applicant would seek a water quality certification from the Ohio EPA pursuant to Section 401 of the federal Clean Water Act (33 U.S.C. 1341). Finally, the Applicant would seek approval by the Ohio EPA for a SWPPP as part of the NPDES permit for storm water discharge associated with construction activities.

Construction methods and their water related impacts along with necessary environmental permits are further discussed in the **Ecological Impacts** section under the *Surface Waters* heading.

With these measures, construction and operation of this facility would comply with requirements of R.C. Chapter 6111, and the rules and laws adopted under that chapter.

#### **Solid Waste**

Debris generated from construction activities would include items such as crates, nails, boxes, containers, packing materials, damaged parts, and general litter/debris. Timber and other vegetative debris may be chipped for use as erosion control mulch or disposed of in accordance with local regulations and landowner preferences. Materials with reuse or salvage value will be removed for such use. The Applicant intends that all construction-related debris would be disposed of in accordance with state and federal requirements.

Operation of the project will generate small amounts of non-hazardous, solid waste, which would be reused, recycled, or disposed of in accordance with state and federal requirements. This waste is



expected to be similar to those generated during construction. Operation of the project will would not generate any hazardous wastes. The Applicant intends to properly dispose of its wastes in a sanitary landfill.

The Applicant intends to hire an environmental consultant firm to perform a Phase 1 Environmental Site Assessment prior to commencing construction of the facility. Any contaminated soils discovered or generated during construction would be handled in accordance with applicable regulations.

The Applicant's solid waste disposal plans comply with solid waste disposal requirements set forth in R.C. Chapter 3734.

### **Aviation**

According to the Applicant, there are no public use airports, helicopter pads, or landing strips within five miles of the project. There are also no private use airports, helicopter pads, or landing strips within or adjacent to the project.

In accordance with R.C. 4906.10(A)(5), Staff contacted the ODOT Office of Aviation during the review of this application in order to coordinate review of potential impacts of the facility on local airports. As of the date of this filing, no such concerns have been identified.

All Staff recommendations for the requirements discussed in this section can be found under the **Air, Water, Solid Waste, and Aviation Conditions** heading of the Recommended Conditions of Certificate.

### **Recommended Findings**

Staff recommends that the Board find that the proposed facility complies with the requirements specified in R.C. 4906.10(A)(5), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this *Staff Report of Investigation* entitled Recommended Conditions of Certificate.

## **Considerations for R.C. 4906.10(A)(6)**

### **PUBLIC INTEREST, CONVENIENCE, AND NECESSITY**

Pursuant to R.C. 4906.10(A)(6), the Board must determine that the facility will serve the public interest, convenience, and necessity.

#### **Public and Private Water Supplies**

The project area lies within a rural section of Brown County. Residents within the vicinity of the project rely upon private wells for their domestic water supply. The Applicant does not anticipate any disruption or adverse impacts to public or private water supplies during the construction or operation of the facility. Specifically, the project would not involve work more than approximately eight feet below the ground surface, operation of the project would use very little water, and the project would not generate any wastewater discharges.

The Applicant has identified that the project area is within the vicinity of at least one area designated as a Source Water Protection Area (SWPA), as defined and approved by the Ohio EPA for the protection of drinking water sources. The SWPA is associated with Mt. Orab. The Ohio EPA and the Ohio Department of Commerce Bureau of Underground Storage Regulations (BUSTR) have adopted regulations that restrict specific activities within these designated areas. Examples of typically restricted activities include concentrated animal feeding operations, sanitary, industrial, or residual waste landfills, land application of biosolids, and voluntary brownfield cleanups. The Applicant has concluded that the construction and operation of the proposed solar farm facility are not restricted activities for a groundwater or surface water SWPA. Staff recommends that the Applicant comply with any drinking water source protection plan for any part of the facility that is located within an SWPA of the local villages or cities.

#### **Public Safety**

The project is required to be constructed, operated, and maintained in accordance with applicable safety regulations, including Occupational Safety and Health Administration requirements, and industry standards. The facility personnel would be trained to operate the equipment in a safe and reliable manner. The Applicant stated that it would secure pertinent federal and state environmental permits, and construct and operate the facility in accordance with all applicable environmental and safety regulations.

The Applicant would limit public access to the facility by installing a security fence around each cluster of solar panels. The fencing will be from six to eight feet tall topped with barbed wire.

#### **Public Interaction**

The Applicant hosted a public informational open house for this project on May 23, 2017. Attendees were provided the opportunity to speak with representatives of the Applicant about the proposed project and to provide comments. The Applicant has also met individually with affected landowners and local officials.

The Applicant served copies of the complete application on officials representing Brown County and Green Township. The Applicant also sent a copy of the complete application to the Mary P. Sheldon Public Library and the Mt. Orab Library. Additionally, copies of the complete application are available for public inspection at the offices of the PUCO and on the PUCO online Docketing

Information System website.<sup>23</sup> The Applicant maintains a project website where visitors can obtain information about the project and access the application.<sup>24</sup>

The Applicant has committed to provide Staff with a copy of its complaint resolution process at least 30 days prior to the start of construction. The Applicant plans to notify affected property owners and tenants, as well as anyone who requests updates regarding the project, at least seven days prior to the start of any construction activities. This notice would include complaint resolution contact information. During the construction of the project, the Applicant plans for its general contractor to identify an individual to address complaints received from the public and will be responsible for making reasonable efforts to resolve complaints. During operation of the facility, the Applicant plans to ensure that a complaint point of contact is established and that reasonable efforts are made to resolve complaints.

The Administrative Law Judge issued an entry on September 22, 2017, scheduling a local public hearing and an adjudicatory hearing for this proceeding. The local public hearing, at which the Board will accept written or oral testimony from any person, is scheduled for November 30, 2017, at 6:30 p.m., at Countryside Inn & Suites, 100 Leininger St., Mount Orab, Ohio, 45154. The adjudicatory hearing is scheduled for December 14, 2017, at 10:00 a.m., at the offices of the PUCO, 11th floor, Hearing Room 11-D, 180 E. Broad St., Columbus, Ohio, 43215.

As of the filing of this Staff Report, the Board has received four public comments from two adjacent landowners. On October 17, 2017, the Ohio Farm Bureau Federation filed a motion to intervene in this case.

### **Liability Insurance Plans**

The Applicant plans to carry insurance to cover liability and potential claims during the construction, operation, and decommissioning of the proposed facility.

### **Land Leases**

The Applicant holds development rights for more than 90 percent of the project area and access rights for the remaining area.

All Staff recommendations for the requirements discussed in this section of the *Staff Report of Investigation* are included under the Recommended Conditions of Certificate section.

### **Recommended Findings**

Staff recommends that the Board find that the proposed facility would serve the public interest, convenience, and necessity, and therefore complies with the requirements specified in R.C. 4906.10(A)(6), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this *Staff Report of Investigation* entitled Recommended Conditions of Certificate.

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23. "Case record for: 17-1152-EL-BGN," Public Utilities Commission of Ohio, accessed October 24, 2017, <http://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=17-1152>.

24. Hillcrest Solar I, LLC, "The Hillcrest Solar Farm," accessed October 24, 2017, <http://www.hillcrestsolar.com>.

## **Considerations for R.C. 4906.10(A)(7)**

### **AGRICULTURAL DISTRICTS**

Pursuant to R.C. 4906.10(A)(7), the Board must determine the facility's impact on the agricultural viability of any land in an existing agricultural district within the project area of the proposed facility. The agricultural district program was established under R.C. Chapter 929. Agricultural district land is exempt from sewer, water, or electrical service tax assessments.

Agricultural land can be classified as an agricultural district through an application and approval process that is administered through local county auditors' offices. Eligible land must be devoted exclusively to agricultural production or be qualified for compensation under a land conservation program for the preceding three calendar years. Furthermore, eligible land must be at least 10 acres or produce a minimum average gross annual income of \$2,500.

No agricultural district parcels would be impacted by the construction or operation of the proposed facility. Within the approximately 2,100 acre project area, 1,738 acres of cultivated lands and 33 acres of pasture land are subject to potential development. However, the total land area that would actually be developed for the project would be less than 1,100 acres, none of which has been classified as agricultural district land.

Agricultural land that has not been classified as an agricultural district in the project area may experience some construction-related activities, such as vehicle traffic and materials storage, that could lead to temporary reductions in farm productivity caused by direct crop damage, soil compaction, broken drainage tiles, and reduction of space available for farming operations. The Applicant has discussed and approved the siting of facility components with landowners in order to minimize impacts, and also intends to take steps in order to address such potential impacts to farmland, including repairing all drainage tiles damaged during construction and restoring temporarily impacted land to its original use.

### **Recommended Findings**

Staff recommends that the Board find that the impact of the proposed facility on the viability of existing agricultural land in an agricultural district has been determined, and therefore complies with the requirements specified in R.C. 4906.10(A)(7), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

### **Considerations for R.C. 4906.10(A)(8)**

#### **WATER CONSERVATION PRACTICE**

Pursuant to R.C. 4906.10(A)(8), the proposed facility must incorporate maximum feasible water conservation practices, considering available technology and the nature and economics of the various alternatives.

The facility may require the use of minimal amounts of water for dust control during construction. During operation the project would use virtually no water and would produce no wastewater discharges. The project would use water only for occasional cleaning of panels to reduce inefficiency in electric generation due to accumulated soiling. Cleaning is expected to occur two or three times annually, and potentially less frequently depending on the amount of rainfall in a given year. All water used for this purpose would be trucked in or acquired from one or more of the participating landowners. The facility would comply with water conservation practice as specified under R.C. 4906.10(A)(8).

#### **Recommended Findings**

The Staff recommends that the Board find that the proposed facility would incorporate maximum feasible water conservation practices, and therefore complies with the requirements specified in R.C. 4906.10(A)(8). Further, the Staff recommends that any certificate issued by the Board for the certification of the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

## **IV. RECOMMENDED CONDITIONS OF CERTIFICATE**

Following a review of the application filed by Hillcrest Solar I, LLC, and the record compiled to date in this proceeding, Staff recommends that a number of conditions become part of any certificate issued for the proposed facility. These recommended conditions may be modified as a result of public or other input received subsequent to the issuance of this report.

### **GENERAL CONDITIONS**

Staff recommends the following conditions to ensure conformance with the proposed plans and procedures as outlined in the case record to date, and to ensure compliance with all conditions listed in this Staff Report:

- (1) The facility shall be installed at the Applicant's proposed site as presented in the application and as modified and/or clarified by supplemental filings, replies to data requests, and the recommendations in this *Staff Report of Investigation*.
- (2) The Applicant shall conduct a preconstruction conference prior to the start of any construction activities. Staff, the Applicant, and representatives of the prime contractor and all subcontractors for the project shall attend the preconstruction conference. The conference shall include a presentation of the measures to be taken by the Applicant and contractors to ensure compliance with all conditions of the certificate, and discussion of the procedures for on-site investigations by Staff during construction. Prior to the conference, the Applicant shall provide a proposed conference agenda for Staff review. The Applicant may conduct separate preconstruction conferences for each stage of construction.
- (3) At least 30 days before the preconstruction conference, the Applicant shall submit to Staff, for review to ensure compliance with this condition, one set of detailed engineering drawings of the final project design, including the facility, temporary and permanent access roads, any crane routes, construction staging areas, and any other associated facilities and access points, so that Staff can determine that the final project design is in compliance with the terms of the certificate. The final project layout shall be provided in hard copy and as geographically-referenced electronic data. The final design shall include all conditions of the certificate and references at the locations where the Applicant and/or its contractors must adhere to a specific condition in order to comply with the certificate.
- (4) If the Applicant makes any changes to the project layout after the submission of final engineering drawings, the Applicant shall provide all such changes to Staff in hard copy and as geographically-referenced electronic data. All changes will be subject to Staff review to ensure compliance with all conditions of the certificate, prior to construction in those areas.
- (5) Within 60 days after the commencement of commercial operation, the Applicant shall submit to Staff a copy of the as-built specifications for the entire facility. If the Applicant demonstrates that good cause prevents it from submitting a copy of the as-built specifications for the entire facility within 60 days after commencement of commercial operation, it may request an extension of time for the filing of such as-built specifications. The Applicant shall use reasonable efforts to provide as-built drawings in both hard copy and as geographically-referenced electronic data.

- (6) Prior to the commencement of construction activities in areas that require permits or authorizations by federal or state laws and regulations, the Applicant shall obtain and comply with such permits or authorizations. The Applicant shall provide copies of permits and authorizations, including all supporting documentation, to Staff within seven days of issuance or receipt by the Applicant. The Applicant shall provide a schedule of construction activities and acquisition of corresponding permits for each activity at the preconstruction conference.
- (7) The certificate shall become invalid if the Applicant has not commenced a continuous course of construction of the proposed facility within five years of the date of journalization of the certificate.
- (8) As the information becomes known, the Applicant shall docket in the case record the date on which construction will begin, the date on which construction was completed, and the date on which the facility begins commercial operation.
- (9) At least 30 days prior to the preconstruction conference, the Applicant shall provide to Staff a copy of its public information program that informs affected property owners and tenants of the nature of the project, specific contact information of Applicant personnel who are familiar with the project, the proposed timeframe for project construction, and a schedule for restoration activities.
- (10) At least 30 days prior to the facility becoming operational, the Applicant shall provide to Staff a copy of the complaint resolution process to address potential public grievances resulting from facility construction and operation. The resolution process must describe how the public can contact the Applicant and how the Applicant will work to mitigate or resolve any issues with those who submit either a formal or informal complaint.
- (11) During the construction and operation of the project, the Applicant shall file a complaint summary report in the case record by the fifteenth day of April, July, October, and December of each year. The report should include a list of all complaints received through its complaint resolution process, a description of the actions taken to resolve each complaint, and a status update if the complaint has yet to be resolved.
- (12) General construction activities shall be limited to the hours of 7:00 a.m. to 7:00 p.m., or until dusk when sunset occurs after 7:00 p.m. Impact pile driving, hoe ram, and blasting operations, if required, shall be limited to the hours between 10:00 a.m. to 5:00 p.m., Monday through Friday. Construction activities that do not involve noise increases above ambient levels at sensitive receptors are permitted outside of daylight hours when necessary. The Applicant shall notify property owners or affected tenants within the meaning of Ohio Adm.Code 4906-3-03(3)(B)(2) of upcoming construction activities including potential for nighttime construction activities.

### **SOCIOECONOMIC CONDITIONS**

Staff recommends the following condition to address the impacts discussed in the **Socioeconomic Impacts** section of the Nature of Probable Environmental Impact:

- (13) Prior to construction, the Applicant shall prepare a Phase I cultural resources survey program for archaeological work for the project area, including post locations, access roads, electric

collection lines, and the project substation, in consultation with Staff and the Ohio Historic Preservation Office (OHPO). If the resulting survey work discloses a find of cultural or archaeological significance, or a site that could be eligible for inclusion on the National Register of Historic Places, then the Applicant shall submit a modification or mitigation plan detailing how such site(s) would be avoided or impacts would be minimized. Any such mitigation effort shall be developed in coordination with the OHPO and submitted to Staff for review and acceptance.

- (14) Prior to the commencement of construction, the Applicant shall conclude an architectural survey of the project area. The Applicant shall submit to Staff a work program that outlines areas to be studied, with the focus on structures that are located near the project area. If the architectural survey discloses a find of cultural or architectural significance, or a structure that could be eligible for inclusion in the National Register of Historic Places, then the Applicant shall submit a modification or mitigation plan for Staff's acceptance. Any such mitigation effort shall be developed in coordination with the OHPO and submitted to Staff for review and acceptance.
- (15) Prior to commencement of any construction, the Applicant shall prepare a landscape and lighting plan that addresses the aesthetic and lighting impacts of the facility where an adjacent non-participating parcel contains a residence with a direct line of sight to the project area. The plan shall include measures such as alternate fencing, vegetative screening, good neighbor agreements, or other measures subject to staff review. The Applicant shall provide the plan to Staff for review and confirmation that it complies with this condition.
- (16) The Applicant shall avoid, where possible, or minimize to the extent practicable, any damage to field tile drainage systems and soils resulting from construction, operation, and/or maintenance of the facility in agricultural areas. Damaged field tile systems shall be promptly repaired to at least original conditions at the Applicant's expense. If applicable, excavated topsoil shall be segregated and restored in accordance with the Applicant's lease agreement with the landowner. Severely compacted soils shall be plowed or otherwise de-compacted, if necessary, to restore them to original condition unless otherwise agreed to by the landowner.
- (17) The Applicant shall provide to Staff a copy of any arrangement or resulting resolution adopted by any county relating to the PILOT program within a reasonable time after issuance or receipt.

### **ECOLOGICAL CONDITIONS**

Staff recommends the following conditions to address the impacts discussed in the **Ecological Impacts** section of the Nature of Probable Environmental Impact:

- (18) The Applicant shall contact Staff, the Ohio Department of Natural Resources (ODNR), and the U.S. Fish and Wildlife Service (USFWS) within 24 hours if state or federal listed species are encountered during construction activities. Construction activities that could adversely impact the identified plants or animals shall be halted until an appropriate course of action has been agreed upon by the Applicant, Staff, and the ODNR in coordination with the USFWS. Nothing in this condition shall preclude agencies having jurisdiction over the construction activities with respect to wildlife from exercising their legal authority over the facility consistent with law.



- (19) The Applicant shall adhere to seasonal cutting dates of October 1 through March 31 for the removal of trees three inches or greater in diameter to avoid impacts to Indiana bats and northern long-eared bats, unless coordination with the ODNR and the USFWS allows a different course of action.
- (20) Construction in loggerhead shrike preferred nesting habitat types shall be avoided during the species' nesting period of April 1 through August 1, unless coordination with the ODNR allows a different course of action.
- (21) The Applicant shall conduct no in-water work in perennial streams from April 15 through June 30, to reduce impacts to indigenous aquatic species and their habitat.
- (22) The Applicant shall have a qualified environmental specialist on site during construction activities that may affect sensitive areas, as mutually agreed upon between the Applicant and Staff, and as shown on the Applicant's final approved construction plan. Sensitive areas include, but are not limited to, areas of vegetation clearing, designated wetlands and streams, and locations of threatened or endangered species or their identified habitat. The environmental specialist shall be familiar with water quality protection issues and potential threatened or endangered species of plants and animals that may be encountered during project construction.
- (23) Prior to the preconstruction conference, the Applicant shall submit a vegetation management plan to Staff for review and confirmation that it complies with this condition. The plan would identify all areas of proposed vegetation clearing for the project, specifying the extent of the clearing, and describing how such clearing work would be done as to minimize removal of woody vegetation. The plan shall describe how trees and shrubs along access routes, at construction staging areas, during maintenance operations, and in proximity to any other project facilities would be protected from damage. The plan shall also describe the implementation of pollinator-friendly plantings and describe any planned herbicide use.
- (24) The Applicant shall provide a construction access plan for review prior to the preconstruction conference. The plan would consider the location of streams, wetlands, wooded areas, and sensitive wildlife and plant species, and explain how impacts to all sensitive resources will be avoided or minimized during construction, operation, and maintenance. The plan would include the measures to be used for restoring the area around all temporary access points, and a description of any long term stabilization required along permanent access routes.

### **AIR, WATER, SOLID WASTE AND AVIATION**

Staff recommends the following condition to address the requirements discussed in the **Air, Water, Solid Waste, and Aviation** section of the Nature of Probable Environmental Impact:

- (25) The Applicant shall comply with any drinking water source protection plan for any part of the facility that is located within a Source Water Protection Area of a local village or city.
- (26) The Applicant shall comply with fugitive dust rules by the use of water spray or other appropriate dust suppressant measures whenever necessary.

## **PUBLIC SERVICES, FACILITIES, AND SAFETY CONDITIONS**

Staff recommends the following conditions to address the requirements discussed in the **Public Services, Facilities, and Safety** section of the Nature of Probable Environmental Impact:

- (27) Prior to commencement of construction activities that require transportation permits, the Applicant shall obtain all such permits. The Applicant shall coordinate with the appropriate authority regarding any temporary or permanent road closures, lane closures, road access restrictions, and traffic control necessary for construction and operation of the proposed facility. Coordination shall include, but not be limited to, the county engineer, the Ohio Department of Transportation, local law enforcement, and health and safety officials. The Applicant shall detail this coordination as part of a final traffic plan submitted to Staff prior to the preconstruction conference for review and confirmation by Staff that it complies with this condition.
- (28) The Applicant shall provide the Board's Staff a copy of the road use agreement(s) and the final delivery route plan 30 days prior to the preconstruction conference.



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