Union Ridge Solar

Exhibit P

Ecological Assessment

Part 1 of 3

Case No. 20-1757-EL-BGN

ECOLOGICAL ASSESSMENT

FOR THE:
UNION RIDGE SOLAR PROJECT
LICKING COUNTY, OHIO

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1.0 INTRODUCTION

Union Ridge Solar, LLC (Union Ridge) is proposing the construction of the 107.7-megawatt (MW) Union Ridge photovoltaic (PV) solar facility (Project). The Project encompasses approximately 520 acres of privately-owned land located 1.2 miles southeast of Pataskala in Licking County, Ohio (Project Area).

In coordination with Union Ridge and Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR), Hull has prepared this Ecological Assessment for the Project. Hull completed a surface water delineation in accordance with the U.S. Army Corps of Engineers manual in anticipation of Clean Water Act Sections 404 and 401 permitting. In addition to the delineation, Hull initiated a consultation with state and federal agencies and reviewed ecological characteristics within the Project Area.

1.1 Project Description

This Ecological Assessment is based on the preliminary layout and design for the Union Ridge Solar project. This report is a required component of Union Ridge's application for a Certificate of Environmental Compatibility and Public Need.

1.1.1 Site Preparation

The general steps for construction of a PV solar facility include installation of stormwater, erosion control, and vegetation protection; determining and securing the perimeter of the construction area; clearing vegetation; minimal earthwork and grading; constructing access roads; and installing equipment for operating the facility. For a full description of the Project components and additional details regarding site preparation, please see Union Ridge's application for a Certificate of Environmental Compatibility and Public Need.

1.1.2 Solar Project Infrastructure

For more information about the Project components, please refer to Union Ridge's application for a Certificate of Environmental Compatibility and Public Need. As proposed, typical overland construction techniques will be used to install the following PV solar infrastructure in the Project Area:

- Solar panels and associated infrastructure, including:
    - Panels that are approximately 4 feet by 7 feet and up to 15 feet above ground level at the highest point;
    - Panels grouped into circuits;

- Panel support piles driven approximately 7 to 10 feet into the ground (approximately 44,000 piles);
- Single-axis tracking equipment and panel mounts;
- Approximately 10 to 20 feet of open space will be left between panel strings;
- Approximately 219 acres of solar panels (assuming panels are lying flat).

- Substation and support facilities, including:
  - An approximately 1.5-acre substation, consisting of electrical breakers, switches, metering equipment, and transformers;
  - An approximately 2,500-square-foot operation and maintenance facility;
  - Perimeter fence and access gates;
  - Up to five on-site meteorological stations that monitor irradiance, air temperature, and wind speed, each mounted on a support column.

- Inverters, including:
  - Inverter pads (approximately 34 total), each approximately 600 square feet in area for a total of approximately 0.5 acres of permanent impacts.
  - Medium voltage transformers

- Collection lines, including:
  - Approximately 6 miles of cable trenching for lines to be buried approximately 36 inches below grade;
  - Federally jurisdictional streams will be avoided using horizontal directional drilling where practical.

- Access roads, including:
  - Approximately 7 miles of access roads;
  - Access roads with an impact width of 25 feet during construction and a permanent impact width of 16 feet after construction.

- Overhead generation interconnection (Gen-Tie) line, including:
  - Overhead line(s) supported on wooden or steel poles whose height is not expected to exceed 100 feet.
  - Pole(s) installed using standard techniques to support 138 kV lines;
  - Temporary work area for construction and materials in the amount of approximately 3.2 acres.

- Equipment laydown area(s), including:
    - Up to approximately 9.5 acres for laydown areas to store equipment and supplies during construction.

1.1.3 Operation and Maintenance

Operation and maintenance personnel will monitor the Project both on-site and remotely (24/7), perform regular on-site inspections, and conduct maintenance activities. On-site activities will be performed by authorized, trained personnel. Solar panels will be regularly inspected and may be occasionally washed – likely two to three times per year. Natural rain wash will keep the solar panels clear of dust and debris for most of the year. Solar panels and components will be maintained or repaired to ensure optimum functionality. Access roads will be maintained, and vegetated areas will be mowed, as needed. Operation and maintenance supplies will be kept in an on-site storage facility.

2.0 REGULATORY OVERVIEW

Union Ridge Solar, LLC is seeking a Certificate of Environmental Compatibility and Public Need (CECPN) from the Ohio Power Siting Board (OPSB). The approval process includes review by several agencies including the U.S. Fish and Wildlife Service (USFWS), Ohio Department of Natural Resources (ODNR), and Ohio's State Historic Preservation Office (SHPO). See Section 3 of this document for additional coordination information.

Table 2-1 below summarizes the various environmental approvals and corresponding regulatory authorities that may apply to the Project.

REGULATORY APPROVALS SUMMARY

TABLE 2-1

Lead Agency	Agency Permit or Approval	Permit Thresholds
Federal		
U.S. Army Corps of Engineers Huntington District	Clean Water Act Section 404	Discharge of fill material into Waters of the U.S. Section 10 of the Rivers and Harbors Act is not applicable for the Project because there are no navigable waterways in the Project Area.
U.S. Fish and Wildlife Service Ohio Field Office	Clearance for threatened and endangered species under either Section 7 or Section 10 of the Endangered Species Act	The Endangered Species Act of 1973 ensures that any action authorized, funded, or carried out by federal agencies does not jeopardize the continued existence of endangered or threatened species or their designated or proposed critical habitats.
State		
Ohio Power Siting Board	Certificate of Environmental Compatibility and Public Need Ohio Administrative Code 4906-4	OPSB has authority to review and approve solar electric generation and transmission facilities that generate 50 MW or more.
Ohio Department of Natural Resources	State rare, threatened, and endangered species Ohio Revised Code 1531.25	The chief of the division of wildlife, with the approval of the wildlife council, shall adopt and may modify and repeal rules, in accordance with Chapter 119 of the Revised Code, restricting the taking or possession of native wildlife, or any eggs or offspring thereof, that he or she finds to be threatened with statewide extinction.
State Historic Preservation Office Ohio Historical Society	Section 106 compliance	Section 106 of the National Historic Preservation Act requires federal agencies to account for potential effects on historic properties and cultural resources. Projects that involve demolition or earthwork must coordinate with SHPO.

Lead Agency	Agency Permit or Approval	Permit Thresholds
Ohio Environmental Protection Agency	Clean Water Act Section 401 Water Quality Certification Ohio Revised Code 6111	Discharge of fill material into Waters of the U.S.
Ohio Environmental Protection Agency	Isolated Wetlands Permit Ohio Revised Code 6111	Fill or disturbance of isolated wetlands.
Ohio Environmental Protection Agency	National Pollution Discharge Elimination System (NPDES) Construction General Permit	The Construction General Permit provides coverage for construction activities with greater than one acre of land disturbance.

2.1 Federal

The Project is located in Licking County, Ohio, within the United States Army Corps of Engineers (USACE) Huntington District. Within the Project Area, the USACE maintains jurisdiction over Waters of the U.S. Final verification of the boundaries of wetlands, streams, and waterbodies can only be completed through the Jurisdictional Determination (JD) review process by the USACE. If the proposed design of the Project will impact Waters of the U.S., then Union Ridge will obtain the necessary Clean Water Act (CWA) permits prior to any proposed impacts to jurisdictional surface waters.

2.2 Section 404/CWA

If impacts to Waters of the U.S. are unavoidable for the Project, then a Nationwide Permit (NWP) could be used to authorize impacts from the facility and its attendant features including roads, parking lots, and stormwater management facilities. Two NWPs are potentially applicable to the Project – NWP 51 for Land-based Renewable Energy Generation Facilities or NWP 57 for Electric Utility Line and Telecommunications Activities. To comply with the requirements of these NWPs, discharge or fill activities must not cause the loss of greater than ½-acre of Waters of the U.S. and/or 300 linear feet of jurisdictional streams. The USACE has authority to make the final determination about which NWP is applicable to the project.

2.3 Section 401/CWA/WQC

In Ohio, the Ohio Environmental Protection Agency (EPA) Division of Surface Water administers Section 401 Water Quality Certifications (WQC). Ohio EPA reviews projects that propose impacts to Waters of the U.S. to ensure compliance with the Clean Water Act and state regulations. Ohio EPA also regulates impacts to Waters of Ohio including isolated wetlands and ephemeral streams. Projects seeking coverage under a Nationwide Permit must consult the Ohio EPA Stream Eligibility Map to determine whether an Individual 401

WQC is required (Figure A.7). Ohio EPA has identified areas where projects are either "Eligible", "Ineligible", or "Possibly Eligible" for coverage under the general WQC. Because the proposed Project is located within an "Eligible" area, it is not anticipated that an individual WQC will be required.

2.3.1 2021 Nationwide Permit 51 Ohio 401 Special Limitations & Conditions

If NWP 51 is used to permit impacts to Waters of the U.S., then the following Ohio 401 Special Limitations and Conditions would apply:

1. Ohio state certification general limitations and conditions apply to this NWP.
2. Individual WQC is required for use of the NWP when temporary or permanent impacts are proposed on or in any of the following waters:
    a. Category 3 wetlands;
    b. Category 1 and Category 2 wetlands when impacts exceed 0.50 acres;
    c. streams located in "Ineligible" areas;
    d. streams located in "Possibly Eligible" areas and determined to be high quality;
    e. state wild and scenic rivers;
    f. national wild and scenic rivers; and
    g. general high-quality water bodies which harbor federally- and state-listed threatened or endangered aquatic species.
3. For an individual stream, while the repair or replacement of an existing culvert of any length is not limited by this certification, any culvert extension shall not exceed 300 linear feet.
4. Temporary or permanent impacts as a result of steam crossings shall not exceed a total of three per steam mile per stream.
5. All hydric soils up to 12 inches in depth within wetlands shall be stockpiled and replaced as the topmost backfill layer. Best management practices, such as silt fencing and soil stabilization, shall be implemented to reduce erosion and sediment run-off into adjacent wetlands.
6. The stockpiling of side cast dredged material in excess of three months requires individual 401 WQC.
7. Buried utility lines shall be installed at a 90-degree angle to the stream bank to the maximum extent practicable. When a 90-degree angle is not possible, the length of any buried utility line within any single waterbody shall not exceed twice the width of that waterbody at the location of the crossing.

2.3.2 2021 Nationwide Permit 57 Ohio 401 Special Limitations & Conditions

If NWP 57 is used to permit impacts to Waters of the U.S., then the following Ohio 401 Special Limitations and Conditions would apply:

1. Ohio state certification general limitations and conditions apply to this NWP.

2. Except for maintenance activities authorized under this NWP, individual WQC is required for use of the NWP when temporary or permanent impacts are proposed on or in any of the following waters:

   a. Category 1 and Category 2 wetlands when impacts exceed 0.50 acres;

   b. streams located in "Ineligible" areas;

   c. streams located in "Possibly Eligible" areas and determined to be high quality;

   d. state wild and scenic rivers;

   e. national wild and scenic rivers; and

   f. general high-quality water bodies which harbor federally- and state-listed threatened or endangered aquatic species.

3. Temporary or permanent impacts to Category 3 wetlands are limited to less than 0.1 acres for activities involving the repair, maintenance, replacement, or safety upgrades to existing infrastructure that meets the definition of public need. Ohio EPA will make the determination if a project meets public need during the ORAM verification process.

4. Temporary or permanent impacts as a result of steam crossings shall not exceed a total of three per steam mile per stream.

5. For an individual stream, while the repair or replacement of an existing culvert of any length is not limited by this certification, any culvert extension shall not exceed 300 linear feet.

6. All hydric soils up to 12 inches in depth within wetlands shall be stockpiled and replaced as the topmost backfill layer. Best management practices, such as silt fencing and soil stabilization, shall be implemented to reduce erosion and sediment run-off into adjacent wetlands.

7. Buried utility lines shall be installed at a 90-degree angle to the stream bank to the maximum extent practicable. When a 90-degree angle is not possible, the length of any buried utility line within any single waterbody shall not exceed twice the width of that waterbody at the location of the crossing.

8. The total width of any excavation, grading, or mechanized clearing of vegetation and soil shall not exceed a maximum of 50 feet.

2.4 Jurisdictional Determination

Hull has made recommendations on the potential jurisdictional status of each surface water feature delineated in the Project Area. Determinations made by Hull must be verified by the USACE after review of a delineation report and a field visit by USACE staff. Delineations are typically valid for a period of five years from the date of the USACE delineation verification letter.

The Code of Federal Regulations (40 CFR 120.2), defines Waters of the U.S. as:

- the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide;

- tributaries;

- lakes and ponds and impoundments of jurisdictional waters; and

- adjacent wetlands.

The USACE has sole authority to determine whether wetlands or other waterbodies are Waters of the U.S. (federal jurisdiction) or waters of the state of Ohio (Ohio EPA jurisdiction). Isolated wetlands and ephemeral streams are under the jurisdiction of the State of Ohio and are regulated by Ohio EPA.

3.0 AGENCY CONSULTATION

3.1 USFWS

On behalf of Union Ridge, Hull requested threatened and endangered species information from the Ohio Field Office of the U.S. Fish and Wildlife Service (USFWS). A response from USFWS was received on November 20, 2020 (Attachment A).

3.2 ODNR

On behalf of Union Ridge, Hull submitted an Environmental Review request to the Ohio Department of Natural Resources (ODNR). A response from ODNR was received on January 13, 2021 (Attachment A).

3.3 SHPO

Union Ridge is coordinating with the Ohio State Historic Preservation Office (SHPO) to avoid and minimize impacts to cultural resources. The resulting information will be provided in a separate document.

4.0 DESKTOP ECOLOGICAL ASSESSMENT

4.1 Land Cover

The land cover assessment was performed by analyzing the 2016 National Land Cover Database (NLCDB 2016) from the Multi-Resolution Land Characteristics Consortium. Mapping of the Project Area is included as Figure A.1. Characteristics of the land cover classifications are modified from the Anderson Land Cover Classification System and are defined as follows:

- **Cultivated Crops** – areas where greater than 20 percent of the total vegetation includes annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. This classification also includes all land being actively tilled.

- **Hay/Pasture** – areas where greater than 20 percent of the total vegetation includes grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle.

- **Deciduous Forest** – areas where greater than 20 percent of the vegetative cover is dominated by trees greater than five meters tall. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.

- **Woody Wetland** – areas where greater than 20 percent of the vegetative cover is forest or shrubland and the soil or substrate is periodically saturated with or covered with water.

- **Developed Open Space** – areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

Based on the assessment of the land cover categories identified, the majority of the Project Area exists as cultivated cropland and hay/pastureland with a deciduous forested stream corridor in the southwestern portion and a woody wetland area in the northeastern portion. The specific breakdown of the land cover types is included in Table 4-1.

LAND COVER WITHIN THE PROJECT AREA

TABLE 4-1

Type	Project Area (Acres)	Project Area (%)
Cultivated Crops	492.20	94.10%
Deciduous Forest	11.77	2.25%
Developed, Low Intensity	2.56	0.49%
Developed, Open Space	5.65	1.08%
Hay/Pasture	9.61	1.84%
Woody Wetlands	1.28	0.25%
Total	523.08	100%

4.1.1 Agricultural conversion

Conversion of land from one type of land cover to another, inherently creates changes that can cause the displacement of species using the habitat. The open landscape created by large areas of row crop agriculture with nearby forested areas creates habitat for common wildlife species. However, the vegetative community is significantly restricted by using herbicides and seeding techniques common in commercial row crop agriculture. Because commercially grown row crop agricultural habitats do not support diverse plant communities and are frequently disturbed by means of agricultural activities such as harvesting and tilling, there is an opportunity to plant a mix of plant species within the solar field that is more conducive to attracting pollinators and other species to increase the overall biodiversity to the Project Area. Thus, while the conversion of the Project Area will reduce the acreage available for agricultural production, it is not expected to significantly disrupt wildlife habitat, and will likely improve conditions for wildlife overall.

4.2 Geology

The Project Area lies in the Central Lowland Till Plains, Galion Glaciated Low Plateau Physiographic Region according to the Physiographic Regions of Ohio Map. The surrounding area displays low rounded hills comprising scattered end moraines and kettles. The soils of this ecoregion are usually less fertile than the high lime till plains and terrain is distinct from the hilly unglaciated areas. Elevations in the Project Area range from 950 feet to 1,050 ft above sea level.

The bedrock geology within the Project Area is summarized by ODNR in its Environmental Review for the Project (Attachment A) and below.

"The uppermost bedrock unit in the project area is the Logan Formation and Cuyahoga Formations Undivided. This unit is Mississippian-age and consists of interbedded shale and sandstone. This unit makes up almost the entirety of the project area. Underlying the Logan Formation and Cuyahoga Formations Undivided is the Lower Mississippian to Upper Devonian-age Sunbury and Bedford Formations Undivided. This unit is characterized by interbedded shales. Sunbury shale is brownish to greenish black and may be carbonaceous and pyritic. Bedford shale is gray to olive green and is often silty and clayey. This unit is the uppermost bedrock unit along parts of the northern border of the project area. Due to significant glacial drift, bedrock is not exposed in the project area (Slucher et al, 2006)."

The locations of the bedrock geology are presented in Figure A.2 Bedrock Geology Map.

4.2.1 Glacial Drift (Project-Specific)

The characteristics of glacial deposits of sediments are summarized by ODNR in the Environmental Review for the Project (Attachment A) and below.

"*The project area lies within the glaciated margin of the state and includes several Wisconsinanage glacial features. Both end and ground moraine deposits are present in the project area. End moraine features make up the north and east portions of the project area and consist of loam till covered in thin loess. Terrain in this area consists of hummocky ridges higher than the adjacent terrain. The south and west portions of the project area are made up of ground moraine features including a silty loam till and flat to gently undulating terrain (Pavey et al, 1999). Glacial drift throughout most of the study area is between 64 and 419 feet thick. Drift is thickest in the north and thinner in the south (Powers and Swinford, 2004)*."

Glacial drift depth location information is presented in Figure A.3 Glacial Drift Thickness.

4.2.2 Karst Terrain (Project-Specific)

Karst areas are determined by and are developed in the presence of limestone, dolomite and gypsum caused by the dissolution of the rock layers. This dissolution of the rock layers causes the development of caves, sinkholes and subsidence issues and can cause unintended issues to the construction of projects in these areas. According to the ODNR Karst Mapping System, no karst areas have been identified in the vicinity of the Project Area.

4.3 Soils

The United States Department of Agriculture Web Soil Survey (Soil Survey) and the Licking County Soil Survey were used to identify the soil types within the Project Area (Table 4-2). The most prevalent soil types are Centerberg silt loam (CeB), Pewamo silty clay loam (Pe), and Bennington silt loam (BeB).

SOILS WITHIN THE PROJECT AREA

TABLE 4-2

Type	Map Unit Description	Hydric Rating	Project Area (Acres)	Project Area (%)
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded	0	0.64	0.12%
AmE	Amanda silt loam, 18 to 25 percent slopes	0	0.29	0.06%
BeA	Bennington silt loam, 0 to 2 percent slopes	8	62.03	11.86%
BeB	Bennington silt loam, 2 to 6 percent slopes	6	106.06	20.28%
Cen1B1	Centerburg silt loam, 2 to 6 percent slopes	7	136.78	26.15%
Cen1C2	Centerburg silt loam, 6 to 12 percent slopes, eroded	4	34.12	6.52%
FoD2	Fox gravelly loam, 12 to 18 percent slopes, eroded	0	2.05	0.39%
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	0	4.49	0.86%
Pe	Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes	94	122.23	23.37%
Sh	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded	8	15.83	3.03%
SkA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	5	0.10	0.02%
So	Sloan silt loam, Columbus Lowland, 0 to 2 percent slopes, frequently flooded	85	1.35	0.26%
St	Stonelick loam, occasionally flooded	0	20.15	3.85%
Ws	Westland silty clay loam	100	16.97	3.24%
Total			523.08	100%

4.3.1 Highly Erodible Soils

The United States Department of Agriculture (USDA) Web Soil Survey was used to determine the erodibility of the soils present within the Project Area. The wind erodibility group (WEG) categories for the soils in the Project Area range from 4 to 6 and are not considered highly erodible. The WEG assigns a value to represent susceptibility to wind erosion, with group 1 being the most susceptible to erosion and group 8 being the least susceptible.

4.3.2 Hydric Soils

The USDA and Web Soil Survey was used to identify the soil types and hydric ratings of soils located within the Project Area (Table 4-2). Hydric soils possess physical and chemical properties indicative of being formed

in frequently wet areas. The hydric soils identified within the Project Area are Pewamo silty clay loam (Pe), Sloan silt loam (So) and Westland silty clay (Ws).

4.4 Biological/Conservation

Information on existing wildlife and plant communities in the Project Area was obtained from several sources including publicly available databases and information from state and federal agencies. Habitat and resources within the Project Area could potentially be used by wildlife for foraging/hunting, breeding, and as a migratory stopover location for birds or insects. Species expected to occur in the Project Area would typically be found in other similar agricultural areas, woodlots, or streams and wetlands. Species of interest in the Project Area would include any state or federally listed rare, threatened, or endangered species (discussed below) or species with recreational or commercial value. Common game species in central Ohio that might utilize the Project Area include white-tailed deer (*Odocoileus virginianus*), fox squirrels (*Sciurus niger*), wild turkey (*Meleagris gallopavo*), American woodcock (*Scolopax minor*), and mallard (*Anas platyrynchos*) and other ducks. Other than the agricultural crops, no commercially valuable plant species are expected to be present in the Project Area.

4.4.1 Vegetative Community

The vegetative communities visible from a desktop analysis show a predominance of row crop agriculture likely consisting of corn (*Zea mays*) and/or soybeans (*Glycine max*) within the Project Area.

An approximately 3-acre area of a woodland with a potential wetland component is visible in the northeast portion of the Project Area, and an approximately 6.5-acre forested riparian corridor can be seen in the southwestern portion of the Project Area, along the South Fork Licking River.

4.4.2 Wildlife Resources

Open landscapes created by large areas of row crop agriculture with nearby forested areas creates habitat for common wildlife species such as white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), and Virginia opossum (*Didelphis virginiana*).

According to the United States Fish and Wildlife Service (USFWS) IPaC system, federally listed threatened or endangered bird species are not expected to be located within the Project Area. Six bird species that may be found in the vicinity of the Project Area were identified as USFWS Birds of Conservation Concern (BCC) including bobolink (*Dolichonyx oryzivorus*), cerulean warbler (*Dendroica cerulea*), Kentucky warbler (*Oporornis formosus*), lesser yellow-legs (*Tringa flavipes),* woodthrush *(Hylocichla mustelina)*, and red-headed woodpecker (*Melanerpes erythrocephalus*).

According to the USFWS, the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*) are considered to possibly be present within the Project Area. A discussion of potential Rare, Threatened or Endangered (RTE) species is found below in Section 4.3.

4.4.2.1 Birds

The eBird website (www.ebird.org, Cornell Lab of Ornithology) was used to identify "Hot Spots" important for birds populations. These areas are known locations for breeding, wintering, and migration stop-over for birds in central Ohio. Two eBird "Hot Spots" were identified within five miles of the Project Area:

- **Pataskala Municipal Park** is located approximately two miles northwest of the Project Area. At least 62 bird species have been observed at this location. The red-headed woodpecker was observed at this location and is listed as a BCC by the USFWS.

- **Thomas J. Evans Foundation Park** is located approximately 2.5 miles northwest of the Project Area. At least 89 bird species have been observed at this location. The wood thrush and red-headed woodpecker were two species observed that are listed as BCCs by the USFWS.

4.4.2.1 Bald Eagles and Raptors

The bald eagle is no longer a state-threatened species in Ohio although it remains protected under the Bald and Golden Eagle Protection Act originally passed in 1940. No public records of bald eagle or sensitive raptor nests were identified for the Project Area. In addition, consultation with USFWS and ODNR also did not identify bald eagle nests within the Project Area.

4.4.3 Rare, Threatened, and Endangered Species

Hull reviewed publicly available resources to determine federal and state listed species that occur in Licking County. These resources included the USFWS IPaC system, ODNR's Listed Animal Species report (updated March 2020), ODNR's state listed plant species for Licking County, and coordination with ODNR Division of Wildlife and the Ohio Field Office of the USFWS. According to the USFWS IPaC system, no critical habitat for RTE species is present in the vicinity of the Project Area. A complete listing of protected wildlife and plant species located in Licking County is included in Attachment B. Table 4-3 includes a list of state protected species and the likelihood of these each occurring within the Project Area.

4.5 Wetlands/Water/Floodplain

Potential wetlands, surface water, and floodplain areas were identified using the U.S. Department of Agriculture (USDA) NRCS Soil Survey for Licking County, historic aerial photographs, National Wetlands Inventory maps, U.S. Geologic Service (USGS) topographic maps, Federal Emergency Management Agency (FEMA) 100-year Floodplain Data, and the USGS National Hydrography Dataset (NHD). Based on the

desktop analysis, Hull identified nine potential wetlands and six potential streams, including the South Fork Licking River.

4.5.1 Navigable Waters

Hull reviewed the USACE Section 10 Navigable Waters list and determined that the South Fork Licking River is not a Section 10 navigable waterway.

4.5.2 Water Quality

The wetlands and streams identified within the project area are located within the watershed of the South Fork Licking River. The South Fork Licking River has an Ohio Aquatic Life Use Designation of Warmwater Habitat. According to the Ohio EPA 2008 Biological and Water Quality Study of the Licking River and Selected Tributaries, the South Fork Licking River exhibits good water quality for fish and macroinvertebrates. The watershed has been experiencing an increase in development of impervious area causing increased sedimentation and pollutants into the system.

4.5.3 Floodplains

An area of FEMA 100-year floodplain is located in the southwestern portion of the Project Area, adjacent to the South Fork Licking River. The location of the 100-year floodplain is depicted on Figure A-6. No project infrastructure is planned within the 100-year floodplain.

5.0 OTHER STUDIES

Union Ridge is also evaluating cultural resources, sound, socioeconomic impacts, and geotechnical characteristics in the Project Area. These evaluations are not included within this ecological assessment but will be provided in separate documents.

6.0 FIELD SURVEYS

Hull performed field surveys of the Project Area in September 2020. During the fieldwork, Hull completed a surface water delineation (Attachment C), visually assessed habitat, and recorded observations of local wildlife.

6.1 Habitat Assessment

Hull assessed wildlife habitat for the 520-acre Project Area by focusing on visual observations of plant communities and evidence of wildlife. Visual reconnaissance was conducted during the wetlands and waterbody delineation. Hull ecologists did not observe any threatened or endangered species. Additionally, Hull visually inspected a 0.25-mile buffer around the Project Area for ecologically important or sensitive features. Outside of the forested components that will mostly be avoided by the Project, there were no ecologically significant or sensitive habitats or species identified in the Project Area.

6.1.1 Plant Communities

Plant communities were initially evaluated during the desktop review of historical aerial imagery and subsequently assessed during the field survey. Land cover in the Project Area is predominantly cropland and hayfields/pasture but includes some deciduous forest and developed land. The plant communities and land cover classifications in the Project Area are common to central Ohio. There were no rare or protected plant species identified during the field survey. Coordination with ODNR did not identify any known occurrences of rare or protected plants in the vicinity of the project area, so species-specific surveys were not conducted.

6.1.1.1 Agricultural

Approximately 94 percent of the Project Area is used for agricultural production. At the time of the field survey, the agricultural fields were planted with corn (*Zea mays*) in the western portion and soybean (*Glycine max*) in the eastern portion of the Project Area. Crops are likely rotated seasonally amongst the fields, but the planted area remains the same. Hull observed several upland grassed swales and overland flow channels within the agricultural fields. Several of these features were assessed for the presence of wetland or stream characteristics and were ruled out as jurisdictional surface waters.

6.1.1.2 Forest

Deciduous forest was identified adjacent to an agricultural field in the northern portion of the Project Area and in the riparian corridor of the South Fork Licking River. In both areas, portions of the forest were delineated as palustrine forested wetlands. The dominant tree species on the site include red oak (*Quercus rubra*), white oak (*Quercus alba*), pawpaw (*Asimina triloba*), sycamore (*Platanus*

occidentalis), cottonwood (*Populus deltoides*), and black willows (*Salix nigra*). The understory was dominated by non-native Eurasian dewberry (*Rubus caesius*).

6.1.1.3 Developed

Development, in the form of agricultural buildings and single-family homes, is less than 2 percent of the land cover in the Project Area. Dominant vegetation in developed areas is lawn grass.

6.1.2 Wildlife Observations

Most of the Project Area lacked significant characteristics of habitat for threatened or endangered species known to inhabit Licking County. Forested areas in the north and southwest portions of the Project Area contained potentially suitable habitat for Indiana bats (*Myotis sodalis*) and Northern long-eared bats (*Myotis septentrionalis*). These protected bats species utilize trees with diameters greater than three inches with cavities or exfoliating bark for summer roosting. Bats were not observed or collected during the field survey. If tree-clearing is proposed, then further coordination has been requested by USFWS and will be necessary at that time (Attachment A).

Habitat quality in the remainder of the Project Area was low due to ongoing agricultural use. The shell of a common snapping turtle (*Chelydra serpentina*) was identified in the floodplain of the South Fork Licking River, indicating a possible population of herpetofauna in the floodplain and stream habitat. White-tailed deer utilize the Project Area for foraging and have been observed by local residents; Hull ecologists did not observe deer in the Project Area during the field survey. Otherwise, Hull observed minimal wildlife using the Project Area and there were no observations of threatened or endangered species during the field survey. Species-specific surveys for protected species were not conducted in the Project Area.

THREATENED AND ENDANGERED SPECIES IN LICKING COUNTY

TABLE 6-1

Common Name	Scientific Name	Listing Status*		Habitat	Critical Habitat in Project Area	Likelihood of Occurrence in Project Area
		Federal	State			
Amphibians & Reptiles						
Eastern hellbender	*Cryptobranchus alleganiensis alleganiensis*		E	Shallow, fast-flowing, rocky streams	No	Not likely to occur; Streams on-site are not fast-flowing and rocky
Spotted turtle	*Clemmys guttata*		T	Flooded forests, marshes, wet meadows, bogs, and woodland streams	No	Not likely to occur; High quality wetland habitat is not present in the Project Area
Eastern Massasauga	*Sistrurus catenatus*		E	Wet prairies, marshes, and low areas along rivers and lakes with sufficient upland habitat	No	Not likely to occur; Wet prairie, marsh, and a mosaic of wetland/upland habitat are not present in the Project Area
Birds						
Upland sandpiper	*Bartramia longicauda*		E	Breeds in grasslands and mosaics of agricultural land.	No	Potential suitable habitat in Project Area in agricultural and crop lands
Norther harrier	*Circus hudsonius*		E	Undisturbed tracts of wetlands and grasslands with low, thick vegetation.	No	Not likely to occur; There are no large, high-quality wetlands within the Project Area
Least bittern	*Ixobrychus exilis*		T	Freshwater marshes and ponds in areas with tall, dense vegetation	No	Not likely to occur; Marsh habitat is not present in the Project Area
Barn owl	*Tyto alba*		T	Open habitats including grasslands and farmland	No	Potential suitable habitat in cropland and forest edges
Mammals						
Northern long-eared bat	*Myotis septentrionalis*	T	E	Hibernates in caves and abandoned mines; Maternity and foraging habitat includes stream corridors with well-developed upland forests	No	Potential suitable habitat in well-developed upland forests with requisite roosting habitat
Indiana bat	*Myotis sodalis*	E	E	Hibernates in caves and abandoned mines; Maternity and foraging habitat includes stream corridors with well-developed riparian woods and upland forests	No	Potential suitable habitat in well-developed upland forests with requisite roosting habitat
Tricolor bat	*Perimyotis subflavus*		E	Hibernates in caves and abandoned mines; Maternity and foraging habitat includes stream corridors with well-developed riparian woods and upland forests	No	Potential suitable habitat in well-developed upland forests with requisite roosting habitat
Little brown bat	*Myotis lucifugus*		E	Hibernates in caves and abandoned mines; Maternity and foraging habitat includes stream corridors with well-developed riparian woods and upland forests	No	Potential suitable habitat in well-developed upland forests with requisite roosting habitat
Black bear	*Ursus americanus*		E	Coniferous and deciduous forests, swamps, meadows;	No	Not likely to occur; Large tracts of

				Typically avoid human interaction		forested habitat are not present tin the Project Area
Mollusks						
Pondhorn	*Uniomerus tetralasmus*		T	Muddy or sandy slow-moving streams that have golden shiner hosts	No	Potential suitable habitat within stream channels
Fawnsfoot	*Truncilla donaciformis*		T	Typically inhabits flowing areas of small to large rivers	No	Not likely to occur; Only small streams are present in the Project Area
Longsolid	*Fusconaia subrotunda*		E	Inhabits small to large rivers with strong current	No	Not likely to occur; Only small streams are present in the Project Area
Sheepnose	*Plethobasus cyphyus*		E	Inhabits small to large rivers with strong current	No	Not likely to occur; Only small streams are present in the Project Area
Insects						
Green-faced clubtail	*Gomphus viridifrons*		T	Found in clean streams in forested landscapes with high oxygen content.	No	Not likely to occur; No forested streams are present in the Project Area
Fish						
Lake chubsucker	*Erimyzon sucetta*		T	Inhabits lakes, ponds, and streams in the Great Lakes basin; Rarely found in streams	No	Not likely to occur; Lakes, ponds, and swamps are not present in the Project Area
Plants						
Cypress-knee sedge	*Carex decomposita*		E	Grows on rotting logs in inundated areas	No	Not likely to occur; Wetlands with significant woody debris are not present in the Project Area
Mud sedge	*Carex limosa*		T	Most commonly found in peat bogs	No	Not likely to occur; No peat bogs are present in the Project Area
Lined sedge	*Carex striatula*		E	Found in rocky forests and outcrops	No	Not likely to occur; Rocky forest habitat is not present in the Project Area
Slender spike-rush	*Eleocharis tenuis*		T	Man-made or disturbed habitats including meadows and stream banks	No	Potential suitable habitat in disturbed portions of the Project Area
Tawny cotton-grass	*Eriophorum virginicum*		T	Marshes, bogs, and wet meadows in acidic soils	No	Not likely to occur; No bogs or wet meadows are present in the Project Area
Buckbean	*Menyanthes trifoliata*		T	Marshes, bogs, and wet meadows in acidic soils	No	Not likely to occur; No bogs or wet meadows are present in the Project Area
American water-milfoil	*Myriophyllum sibiricum*		E	Most commonly found in calm standing water of ponds	No	Not likely to occur; No ponds or areas of standing water are present in the Project Area
Rose pogonia	*Pogonia ophioglossoides*		T	Marshes, bogs, and wet meadows in acidic soils	No	Not likely to occur; No bogs or wet meadows are present in the Project Area
Tall cinquefoil	*Potentilla arguta*		E	Dry prairies, open woods, and roadsides	No	Potential suitable habitat along roadsides surrounding the Project Area
Scheuchzeria	*Scheuchzeria palustris*		E	Marshes, bogs, and wet meadows in acidic soils	No	Not likely to occur; No bogs or wet meadows are present in the Project Area

Lesser bladderwort	*Utricularia minor*		T	Aquatic species typically found in lakes and ponds	No	Not likely to occur; No ponds or areas of standing water are present in the Project Area

* (E) Endangered, (T) Threatened

6.2 Surface Water Delineation

Hull completed a surface water delineation for the 520-acre Project Area in September 2020. To refine the information gathered during the desktop review, Hull collected hydrology, soil, and vegetation data at 34 locations throughout the Project Area (Attachment C, Appendix B). This data was used to develop surface water delineation maps (Attachment C, Figures 6 and 6a-6h). All surface waters identified within the Project Area are located within the Licking Watershed (hydrologic unit code 05040006). The regulatory floodway and 100-year floodplain of the South Fork Licking River traverse the southwest porting of the Project Area along the length of the river (Attachment C, Figure 7).

6.2.1 Wetland Delineation Methods

Wetland edges were located in the field using procedures outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) and the 2010 Regional Supplement to the Delineation Manual for the Midwest Region Version 2.0, subsequent USACE memoranda and regulatory guidance, and basic principles of plant community ecology.

The plant communities identified within the Project Area were investigated in detail using the three-criterion wetland delineation approach. The wetland indicator status of plant species was determined using the National Wetland Plant List (Lichvar et al., 2018). After characterizing the vegetation, hydrology, and soils of a plant community type and becoming familiar with the soil, vegetation, and/or hydrologic cues that indicated the upland-wetland boundary, Hull recorded the wetland boundaries using Global Positioning System (GPS) technology and took periodic collection of additional soil, vegetation, or hydrologic data to refine the upland-wetland break. A data point was collected in each wetland or wetland mosaic and there was a corresponding upland data point taken outside of the wetland boundary, which was used to describe the upland community surrounding the wetland.

6.2.2 Wetland Assessment Methods – Ohio Rapid Assessment Method (ORAM)

Hull performed an evaluation of wetlands mapped within the Project Area using the Ohio Rapid Assessment Method for Wetlands (Mack, 2001), Final Version 5.0 (ORAM). The ORAM value assessment is based on review of resource materials, data obtained in the field, and the acreage as determined by delineation and mapping. The wetland value information is provided to the Ohio EPA during permitting coordination for the purpose of placing wetlands into the appropriate wetland Antidegradation Category described in Ohio's

Wetland Water Quality Standards (Sections 3745-1-05 and Sections 3745-1-50 through 3745-1-54). There are three possible Ohio Wetland Antidegradation Categories to which wetlands may be assigned:

- *Category 1* – Lowest value category. Generally limited to small, low-diversity wetlands and wetlands with a predominance of non-native invasive species.

- *Category 2* – Middle value category. Wetlands in this category are of moderate diversity but do not contain rare, threatened, or endangered species. They are generally degraded but are capable of attaining higher value. Most wetlands in Ohio are expected to fall into this category.

- *Category 3* – Highest value category. Wetlands in this category may be large; diverse; represent rare plant community types; contain rare, threatened, or endangered species; or any combination of these and several other factors.

6.2.3 Wetland Summary

Nine wetlands were delineated comprising a total of 5.78 acres within the Project Area (Attachment C, Appendix B, Table 2). Eight of these wetlands were determined to be either abutting or adjacent to relatively permanent surface waters, likely making them federally jurisdictional under the current federal guidelines (33 CFR Part 328). One wetland was determined to be non-abutting or adjacent to relatively permanent waters, likely making it non-jurisdictional under federal the current federal guidelines (33 CFR Part 328). Because isolated wetlands are regulated in Ohio, this wetland would likely fall under the jurisdiction of the state. Of all the wetlands, five were evaluated as Category 1 and four were evaluated as Category 2 (Attachment C, Appendix C).

6.2.4 Waterbody Delineation Methods

Stream channels identified on USGS topographic maps are generally found to be under the CWA jurisdiction of the USACE (Figure 1: Project Area Location Map). Additional streams may be identified in the field by the presence of an ordinary high water mark (OHWM), defined bed and bank, and other stream morphological features. The USACE Regulatory Guidance Letter No. 05-05 provides guidance for identifying the OHWM. Where possible, stream channels are investigated upstream to identify the source of water and downstream to determine if the channel ends in a wetland, a confluence with another stream, a culvert inlet, or another resource.

6.2.5 Waterbody Assessment Methods

Hull utilizes the Ohio Qualitative Habitat Evaluation Index (QHEI) scoring method to evaluate streams with a drainage area greater than one square-mile and/or pools greater than 40 centimeters deep. On streams with a drainage area less than one square mile and with pools less than or equal to 40 centimeters deep, Hull uses the Ohio Headwater Habitat Evaluation Index (HHEI) and other physical observations. These

methods yield a numerical score for the stream reach evaluated, which in combination with other physical observation data, is used to estimate the habitat quality of each stream.

The boundaries of the Project Area were evaluated in relation to the Ohio EPA Stream Eligibility Web Map (Ohio EPA, 2017) to determine whether the stream is eligible for coverage under the 401 WQC for the NWPs or whether an individual 401 WQC or Ohio EPA Director's Authorization will be required. At stream locations in "Possibly Eligible" areas where surface water is present, pH values are taken utilizing an Oakton pH2+ pen meter. Hull utilizes the flow charts provided by Ohio EPA to clarify when streams that score high on the HHEI or QHEI, and are also mapped in "Possibly Eligible" areas, may be subject to individual 401 WQC or Director's Authorization procedures. The Project Area was determined to lie within an "Eligible" area, so further evaluation was not performed.

6.2.6 Waterbody Summary

Six streams were delineated totaling approximately 10,103 linear feet within the Project Area (Attachment C, Appendix A, Table 3). Five of these streams were determined to be relatively permanent waters and contain intermittent or perennial flow, making them likely jurisdictional under the current federal guidelines (33 CFR Part 328). One stream was determined to be a non-relatively permanent water and contain ephemeral flow regime, likely making it non-jurisdictional under the current federal guidelines (33 CFR Part 328). Because non-relatively permanent, ephemeral streams are regulated in Ohio, this stream would likely fall under the jurisdiction of the state (3745-1-02 OAC). All streams were evaluated using either the HHEI or QHEI assessment methods (Attachment C, Appendix D).

6.3 Ohio Mussel Survey

All native mussels are protected in Ohio (Ohio Revised Code Section 1533.324). At least ten federally listed mussel species are found in Ohio and are protected by the Endangered Species Act. Impacts to protected mussels must be avoided or minimized to the extent feasible. ODNR and USFWS have developed the Ohio Mussel Survey Protocol (2020) to determine the presence or probable absence of federally listed species and provide a strategy for protecting all native mussels in Ohio.

During the desktop review, Hull identified the South Fork Licking River as a Group 1 mussel stream in the southwest portion of the Project Area. During the field survey, Hull utilized the methods described in the Ohio Mussel Survey Protocol to complete the field component of a mussel reconnaissance survey on the South Fork Licking River. No live or fresh dead native mussels were observed during the survey. At the time of this report, results of the reconnaissance survey have not been coordinated with ODNR.

OHIO MUSSEL STREAM CLASSIFICATION

TABLE 6-1

Group	Criteria
Unlisted	Streams not listed in Appendix A of the Ohio Mussel Survey Protocol with watersheds greater than 5 mi^2 with the potential for mussels but federally listed species are not expected.
Group 1	Small to mid-sized streams where federally listed species are not expected.
Group 2	Small to mid-sized streams where federally listed species are expected.
Group 3	Large rivers where federally listed species are not expected.
Group 4	Large rivers where federally listed species are expected.

Source: Ohio Mussel Survey Protocol (2020)

7.0 ESTIMATED PROJECT IMPACTS

7.1 Project Infrastructure Summary

The proposed Project infrastructure will consist of the components necessary to generate and transmit electricity from production to the electricity grid; these components consist of photovoltaic (PV) panel arrays, underground electrical collection lines, overhead electrical utility lines, DC-AC inverters, electrical substation, access roads, security fencing, an operations and maintenance (O&M) building, and weather stations. During construction of facility, temporary infrastructure including temporary access roads and a laydown yard will be required in addition to the permanent structures described. The permanent footprint of the Project will encompass approximately 438 acres. An additional approximately 85 acres will be required during the construction of the Project for temporary access and infrastructure.

The Union Ridge Solar complex will likely include the following typical PV system infrastructure:

- PV panel sizes will be approximately 4 feet by 7 feet and will extend up to 15 feet above ground level at the highest point.
- Arrays will be organized into strings or rows;
- Panel racking and single-axis tracking equipment;
- Panel racking foundation piles will have a footprint of 4.5 square inches each (approximately 44,000 piles for a total coverage of approximately 0.03 acres), and will be driven approximately 7 to 10 feet deep into the ground;
- There will be approximately 10 to 20 feet of open space between array strings;
- Project collection substation approximately 1.5 acres in size;
- An approximately 2,500 square foot operation and maintenance facility;
- Approximately 1,500-2,500 feet of above ground 138 kV generation tie-line;
- Security fencing and access gates;
- Inverter and medium voltage transformer pads (approximately 34 total) will be approximately 600 square feet each for a total of approximately 0.5 total acres of permanent impacts to uplands;
- Approximately 6 miles of underground electrical collection lines;
- Access roads with an impact width of 25 feet during construction but limited to a permanent impact width of 16 feet after construction;
- Temporary parking/laydown access areas will encompass approximately 9.5 acres.

Table 7-1 summarizes the proposed permanent infrastructure and corresponding area required.

SUMMARY OF PROPOSED PERMANENT INFRASTRUCTURE

TABLE 7-1

Feature	Approximate Area Required (acres)
Total Project Area	523.08
Tree Clearing	0.4
Solar Arrays	219
Solar Array Piles	0.03
Electrical Substation	1.4
Inverter Pads/Pyranometer Stations	0.5
Underground Collection Line	2.7
Access Roads	21.3

7.2 Natural Resource Impacts Summary

Impacts to natural resources are anticipated to be insignificant overall due to majority of the proposed land impacts being located within an existing agricultural setting and due to the efforts made throughout the design of the Project to avoid and minimize impacts to natural resources. Of the 5.78 total acres of wetlands and 10,103 total linear feet of streams delineated within the Project Area, permanent, unavoidable impacts are proposed to approximately 0.006 acres of emergent wetlands and approximately 32 linear feet (0.003 acres) of perennial stream channel.

Tables 7-2 and 7-3 summarize the proposed temporary and permanent structures and their corresponding impacts to natural resources.

SUMMARY OF PROPOSED TEMPORARY IMPACTS TO NATURAL RESOURCES

TABLE 7-2

Impact Type	Upland Area (acres)	Wetland Area (acres)	Stream Area (acres)	Stream Length (linear feet)
Gravel Access Roads	7.65	0.003	0.001	18.0
Underground Collection Line	2.7	0	0	0
Overhead Collection Line	0	0	0	0
Equipment Laydown Yard	9.25	0	0	0
Electrical Substation	0	0	0	0
Array Piles	0	0	0	0
Gen-Tie Line	2.84	0.36	0.012	65.22
Inverter Pads	0.5	0	0	0
Pyranometer	0	0	0	0
Total:	22.9	0.363	0.013	74.22

SUMMARY OF PROPOSED PERMANENT IMPACTS TO NATURAL RESOURCES

TABLE 7-3

Impact Type	Upland Area (acres)	Wetland Area (acres)	Stream Area (acres)	Stream Length (linear feet)
Gravel Access Roads	13.6	0.006	0.003	32.0
Underground Collection Line	0	0	0	0
Overhead Collection Line	0	0	0	0
Equipment Laydown Yard	0	0	0	0
Electrical Substation	1.5	0	0	0
Array Piles	0.03	0.00006	0	0
Gen-Tie Line	0	0	0	0
Inverter Pads	0.5	0	0	0
Pyranometer	0	0	0	0
Total:	15.63	0.006	0.003	32.0

7.2.1 Land Cover

The existing land cover within the Project Area consists predominantly of active agricultural land (95.68%). Wooded areas comprise 1.55% of the Project Area and are concentrated in a woodlot on the northeast side of the Project Area and within the riparian corridors of the South Fork Licking River and Stream 4 in the southwest side of the Project Area. The Project will result in the conversion of agricultural land to a large-scale solar system. Active agriculture provides minimal species habitat since the land is heavily modified and treated with chemical applicants. The Project is not expected to result in degradation of native land cover. The row spacing, height of solar panels from the ground, and small footprint of the piling, will allow for native vegetation to be planted and managed beneath and surrounding the arrays. The proposed land cover is expected to offer native pollinator habitat per the OPHI. As a result, the Project is expected to have a positive impact on habitat for pollinating insects.

7.2.2 Uplands

A significant amount of land is required to host the infrastructure needed to complete a PV solar system. The Project proposes to build the vast majority of the required infrastructure on uplands thus avoiding or minimizing impacts to surface waters.

7.2.2.1 Upland Soils

Some areas of upland soil will be temporarily disturbed during construction. Permanent impacts to upland soils are necessary to support infrastructure, including approximately 44,000 array piles (totaling approximately 0.03 acres), 34 inverter pads (approximately 0.5 acres), an equipment storage area (approximately 2,500 square feet), and an electrical substation (approximately 1.5 acres).

7.2.2.2 Tree Clearing in Forested Uplands

Throughout the design of the Project, efforts have been made to avoid impacts to wooded areas wherever possible. A small amount of tree clearing (approximately 0.4 acres) is proposed as a part of this project. Trees will be cleared during the recommended time of year to avoid impacts to migratory birds or protected bats.

7.2.3 Wetlands and Waterbodies

Hull delineated nine wetlands and six streams including the South Fork Licking River within the Project Area. Wetlands and streams within the Project Area ranged from low to high quality based on the standard, Ohio evaluation methods used. Low quality waters showed signs of disturbance from farming activities and nearby residential development. Moderate to high quality waters were those that contained a natural buffer between themselves and the adjacent farmland or residential properties.

Impacts are proposed to two emergent wetlands and one perennial stream for the permanent placement access roads and the solar array. In addition, one wetland and one stream will be bored using horizontal directional drilling (HDD) to install an underground collection line.

Throughout the design of the Project, considerable effort was made to avoid and minimize impacts to surface waters to the maximum extent practicable. Moderate to high-quality wetlands and waterbodies will be marked for avoidance. Adverse effects from surface water runoff during construction will be minimized through the use of Best Management Practices (BMPs). Stormwater controls will be kept in-place through the completion of construction and removed once permanent stabilization measures have been installed. Surface water impact summary tables can be found in Attachment D, and an Inadvertent Release of Drilling Fluid Contingency Plan in Attachment E.

7.2.4 Aquatic and Wildlife Resources

The Project is not expected to result in significant impacts to wildlife. Information received from state and federal agencies indicates that no rare, threatened, or endangered species are known to occur within a one-mile radius of the Project. Particular attention was paid to wildlife habitat during the field survey to identify any potential high-quality habitat within the Project Area. In its current use, the majority of the Project Area does not offer high quality habitat for wildlife due to the frequent, widespread maintenance associated with farming practices.

Areas which could potentially provide high quality habitat will be avoided by the Project. Long-term effects of the Project to wildlife are considered negligible since the proposed end use will have comparable (and in some instances improved) benefits to wildlife as the existing land cover. Temporary impacts consisting of incidental injury or mortality of juvenile or slow-moving animals, downstream siltation in streams, habitat disturbance, and displacement of wildlife could occur as a result of construction activities. Fencing will be installed that will restrict the movement of larger wildlife, including deer, into the Project Area. It is expected that wildlife will potentially find pathways into the Project Area by jumping or burrowing under fences. It is anticipated that displaced wildlife will move to adjacent properties that have similar habitat characteristics (i.e., agriculture and woodlots). Once operational, the facility is not expected to significantly impact wildlife migrations, foraging patterns, or habitat.

7.2.5 Impacts to Rare, Threatened, or Endangered Species

The majority of the existing Project Area does not offer high-quality habitat suitable for rare, threatened, or endangered species due to the frequent and widespread maintenance activities associated with agricultural production. In addition, information received from state and federal agencies indicates that no

rare, threatened, or endangered species are known to occur within a one-mile radius of the Project. Precautionary measures such as winter tree-clearing and wetland and waterbody avoidance/minimization will be taken to reduce the potential effects of the Project on listed species in the unlikely event they occur in the Project Area. It is unlikely that any state or federally listed species will be impacted by the Project, therefore no post-construction wildlife monitoring is proposed at this time.

7.2.6 Disposal of Plant-Generated Wastes

The storage and use of fuel, lubricants, and other fluids could create a potential contamination hazard during Project construction. Any spills or leaks of hazardous fluids could potentially contaminate soil and groundwater. The impact of leaks and spills will be minimized or avoided by restricting the location of refueling activities and by requiring immediate cleanup of spills and leaks of hazardous materials. Construction equipment will be maintained regularly, and the source of any leaks will be identified and repaired immediately. Any soil contaminated by fuel or oil spills would be removed and disposed of at an approved disposal site.

Temporary portable sanitary facilities would be installed during construction and sanitary wastes would be disposed of by a contractor per local, state, and federal regulations.

Project construction will generate some solid waste, primarily plastic, wood, cardboard and metal packing/packaging materials, construction scrap, and general refuse. Construction waste will be collected and disposed of in dumpsters located at the laydown areas. A private contractor will empty the dumpsters on an as needed basis and dispose materials at a licensed solid waste disposal facility. Waste volumes are expected to be minimal and will not affect local waste disposal facilities. Staff will monitor Project operations from an off-site location, and conduct periodic cleaning and on-site maintenance procedures, as needed. The minimal wastes generated from these activities will be removed from the Project site and disposed of in accordance with Federal, state, and local regulations.

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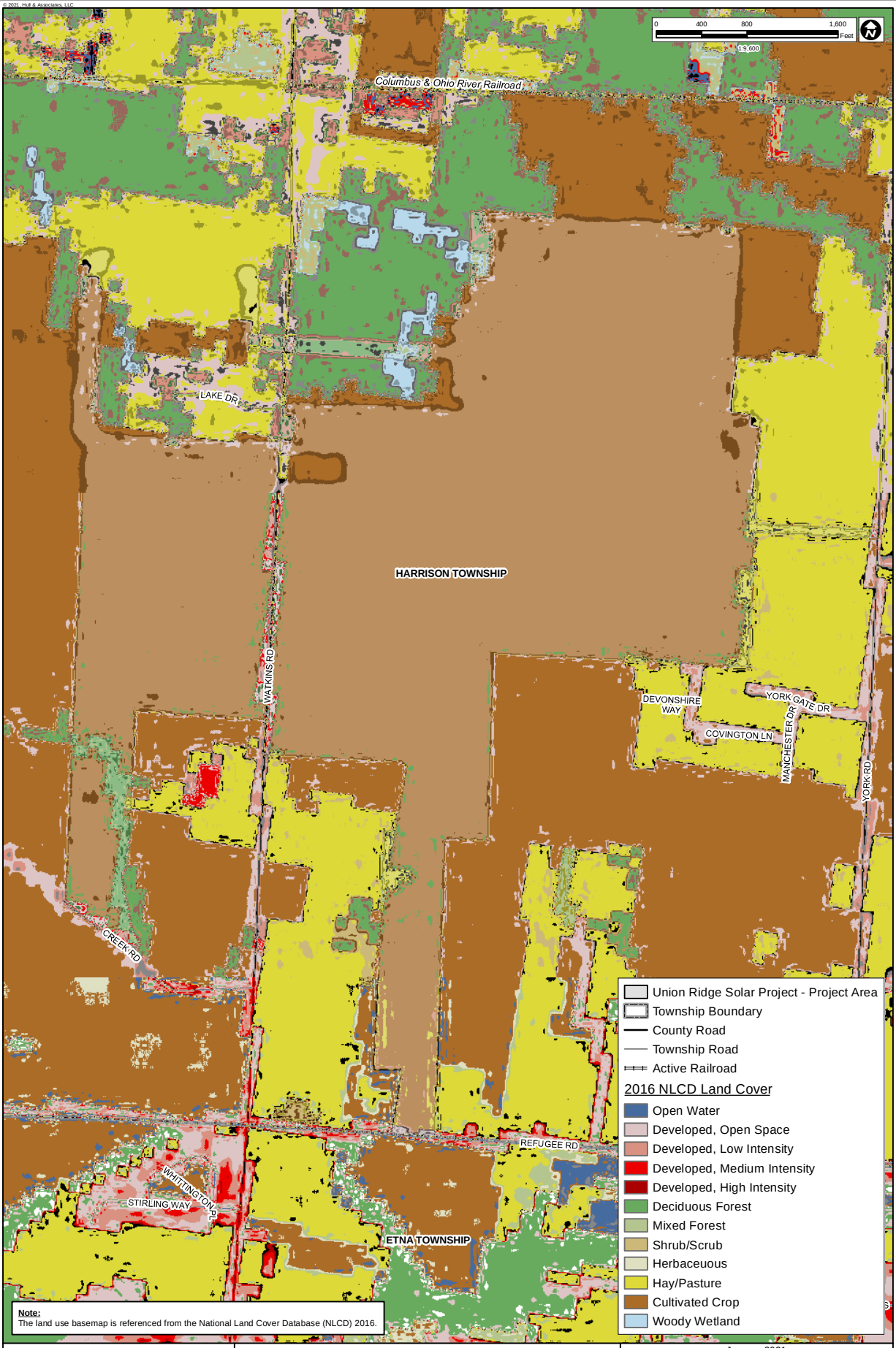
FIGURES



Note:
The land use basemap is referenced from the National Land Cover Database (NLCD) 2016.

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January 2021

Ecological Assessment Report
Union Ridge Solar Project
Union Ridge Solar, LLC

Land Use

Pataskala, Licking County, Ohio

Figure
A.1

Produced Using Esri's ArcGIS Software
File Name: EVD009_02_Fig A.1_LandUse.mxd
Edited: 1/14/2021 By: rkaip

Note:
The aerial photo was acquired from the Ohio Statewide Imagery Program (OSIP). Aerial photography dated 2019.

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Bedrock Geology

Pataskala, Licking County, Ohio

Figure A.2

Produced Using Esri's ArcGIS Software
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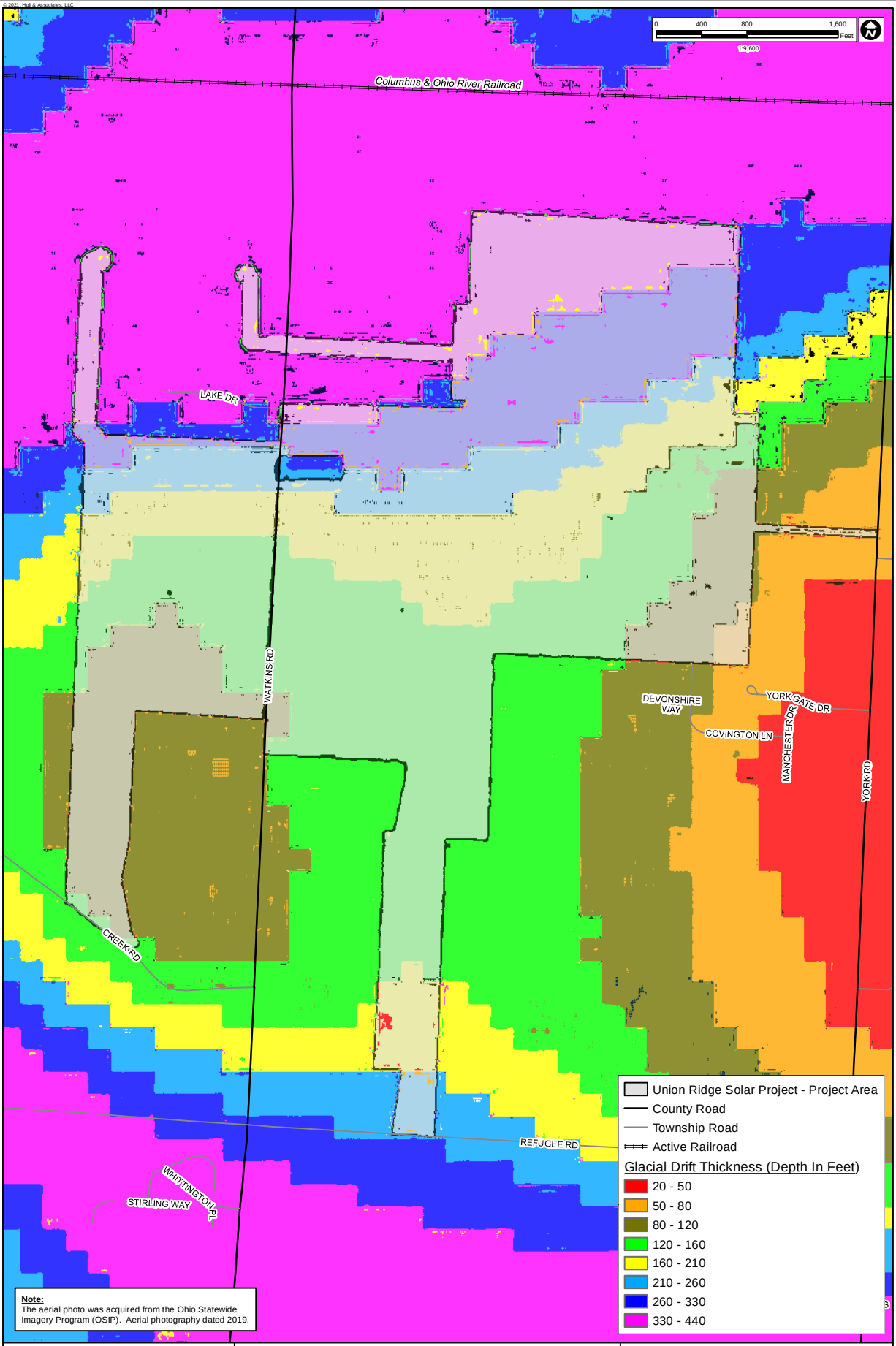

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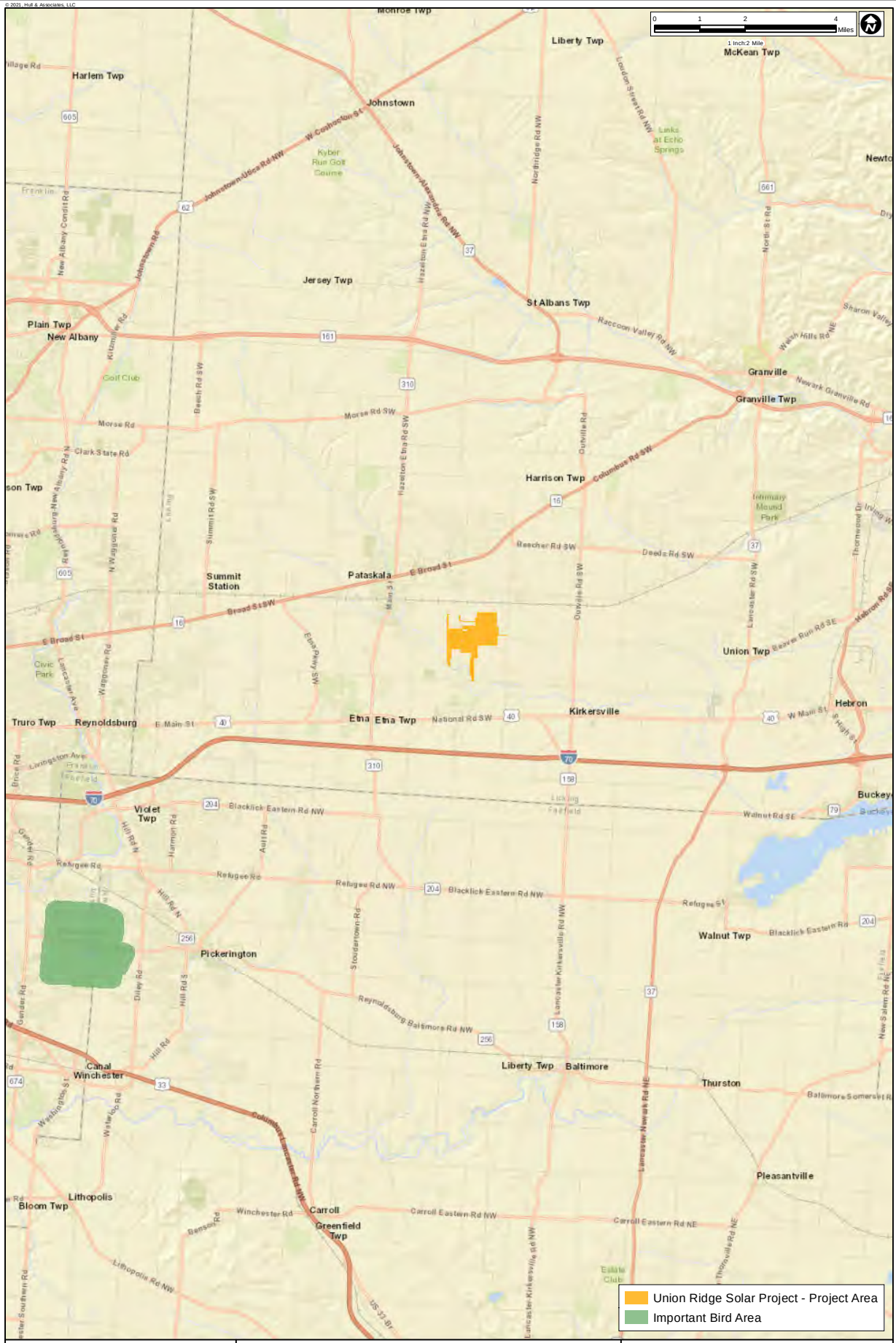
Glacial Drift Thickness

Pataskala, Licking County, Ohio

Figure
A.3

Produced Using Esri's ArcGIS Software
File Name: EVD009_02_Fig A.3_GlacialDrift.mxd
Edited: 1/14/2021 By: rkaip



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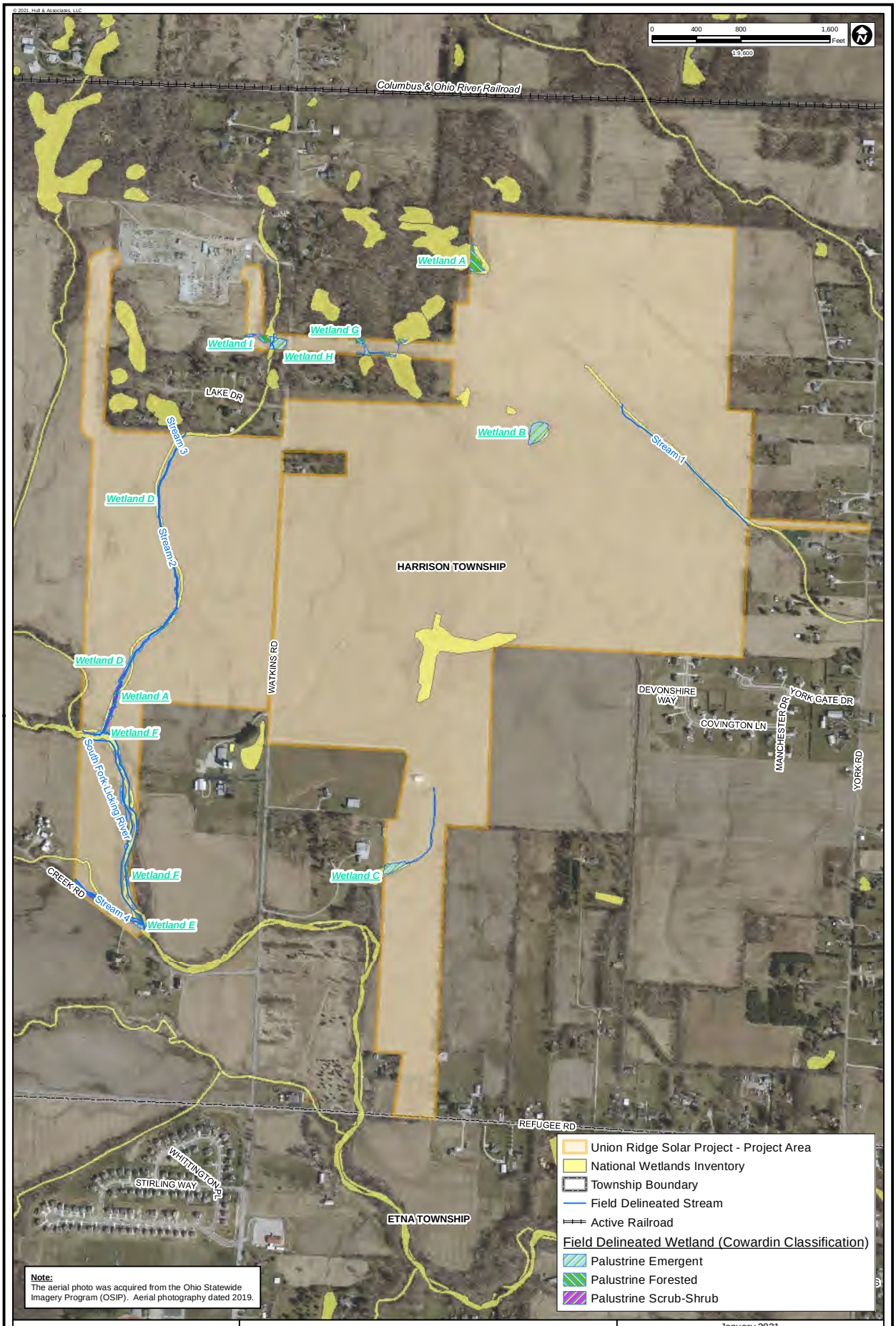
Ecological Assessment Report
Union Ridge Solar Project
Union Ridge Solar, LLC

Regional Wildlife Areas

Pataskala, Licking County, Ohio

Figure
A.4

File Name: EVD009_02_Fig A.4_RegionalWildlifeAreas.mxd
Edited: 1/14/2021 By: rkelp



Note:
The aerial photo was acquired from the Ohio Statewide Imagery Program (OSIP). Aerial photography dated 2019.

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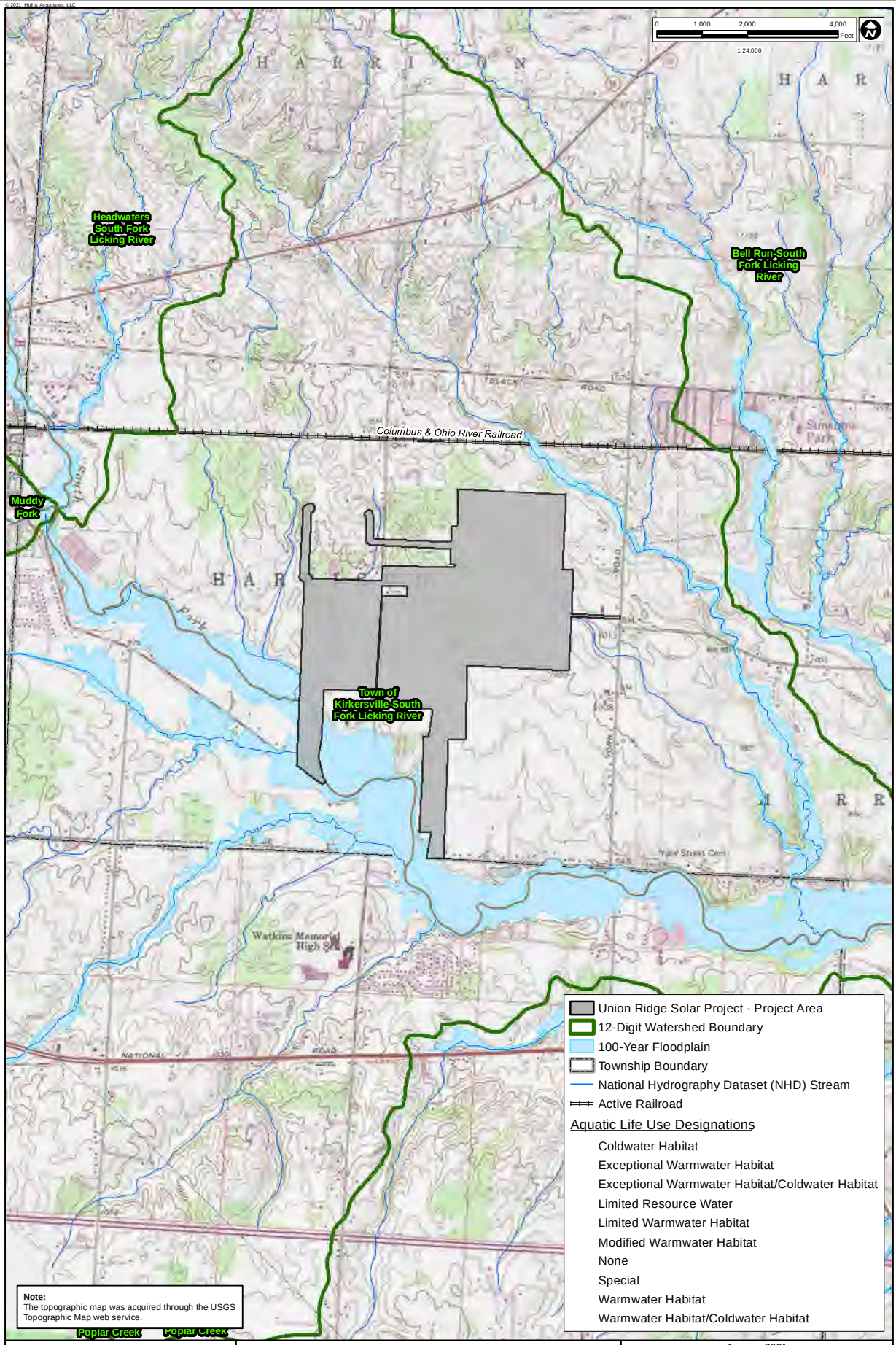
Wetlands

Pataskala, Licking County, Ohio

Figure
A.5

Produced Using Esri's ArcGIS Software
File Name: EVD009_02_Fig A.5_Wetlands.mxd
Edited: 1/19/2021 By: rkaip



Note:
The topographic map was acquired through the USGS Topographic Map web service.

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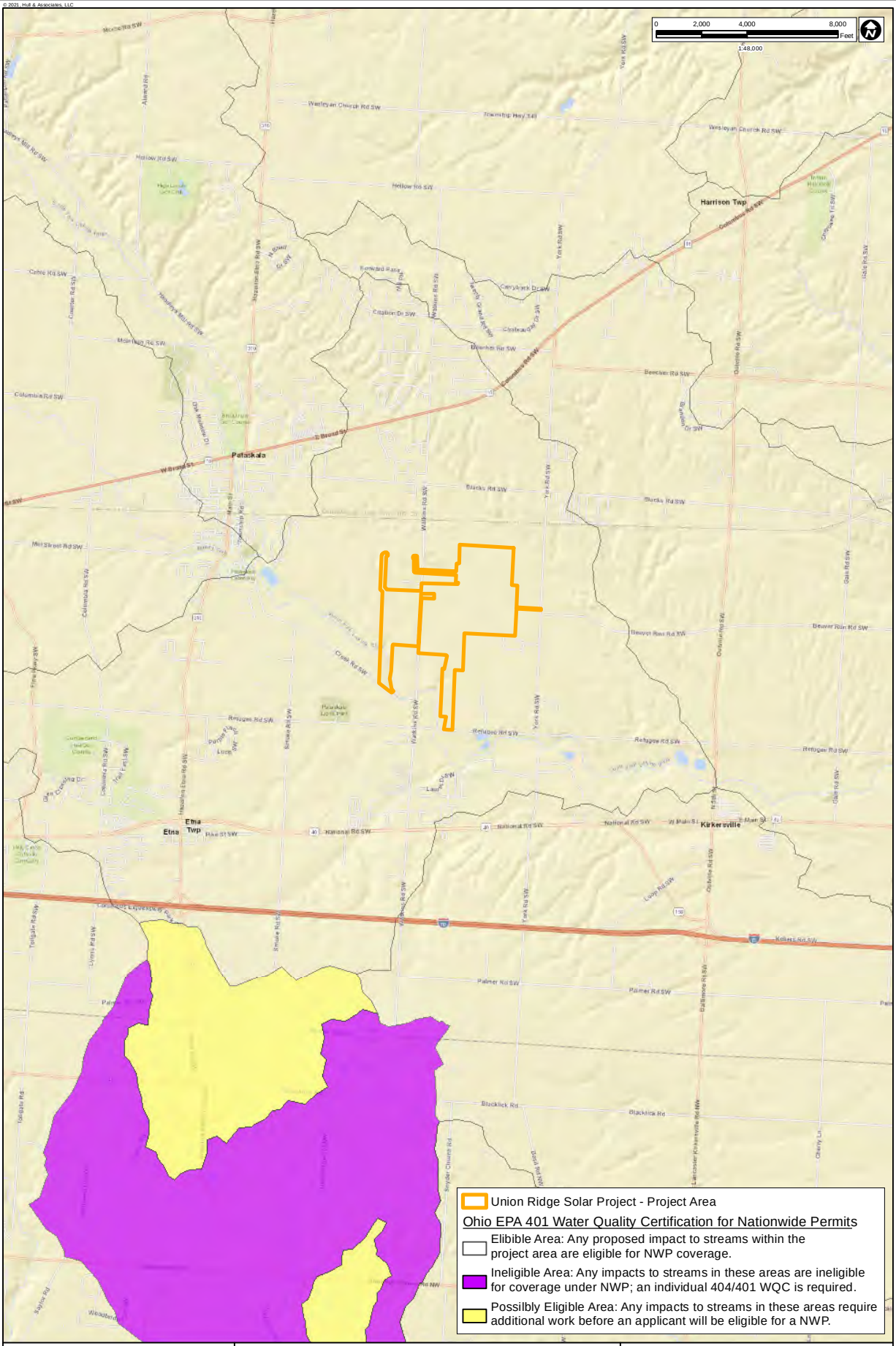
Union Ridge Solar, LLC

Watersheds

Pataskala, Licking County, Ohio

Figure
A.6

Produced Using Esri's ArcGIS Software
File Name: EVD009_02_Fig A.6_Watersheds.mxd
Edited: 1/14/2021 By: rkalp



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Union Ridge Solar Project,
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401 Water Quality Certification

Pataskala, Licking County, Ohio

Figure A.7

Produced Using Esri's ArcGIS Software
File Name: EVD009_02_FigA-7_401WaterQualityCertification.mxd
Edited: 1/14/2021 By: rkalp

ATTACHMENT A

Agency Correspondence

Helena Hayter

From: Ohio, FW3 <ohio@fws.gov>
Sent: Friday, November 20, 2020 1:51 PM
To: Helena Hayter
Cc: Jordan Rofkar
Subject: Union Ridge Solar Project EVD009, Licking County Ohio

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

TAILS# 03E15000-2021-TA-0307

Dear Ms. Hayter,

We have received your recent correspondence requesting information about the subject proposal. There are no Federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area.

FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project, type, size, and location, we do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species. At this time, tree clearing is not being proposed for this project. Should tree clearing become necessary, and/or should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the U.S. Fish and Wildlife Service should be initiated to assess any potential impacts.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Patrice M. Ashfield
Field Office Supervisor

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6621
Fax: (614) 267-4764

January 13, 2021

Helena Hayter
Hull & Associates, Inc.
6397 Emerald Parkway, Suite 200
Dublin, Ohio 43016

Re: 20-1071; Union Ridge Solar Project

Project: The proposed project involves the construction of a solar facility on approximately 470 acres.

Location: The proposed project is located in Harrison and Etna Townships, Licking County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has no records at or within a one-mile radius of the project area.

A review of the Ohio Natural Heritage Database indicates there are no other records of state endangered or threatened plants or animals within the project area. There are also no records of state potentially threatened plants, special interest or species of concern animals, or any federally listed species. In addition, we are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The Division of Wildlife is working closely with our partners at Ohio Pollinator Habitat Initiative (OPHI) to create and enhance pollinator habitat at solar power installations. Attached for your use is the Ohio Solar Site Pollinator Habitat Planning and Assessment Form. This form was developed by the OPHI Solar Pollinator Program Advisory Team. We recommend that the areas between and around the solar panels be planted with legumes and wildflowers (i.e. forbs) that are beneficial to pollinators and other wildlife and reduce use of non-native grass and gravel. The recommended legumes and forbs listed below are low-growing so as not to cast shadows on the solar panels and would only require one to two mowings a year for maintenance, which should minimize maintenance costs. For other areas of the installation where vegetation does not have to be low-growing, alternative pollinator mixes are available with a more diverse array of flowering plants. This perennial vegetation will provide beneficial foraging habitat to songbirds and pollinators while reducing storm water runoff, standing water, and erosion. Please contact the Ohio Pollinator Habitat Initiative http://www.ophi.info/, and specifically Mike Retterer mretterer@pheasantsforever.org for further information on solar power facility pollinator plantings.

Recommended low-growing grasses and forbs may include:

Little Bluestem	*Schizachyrium scoparium*
Sideoats Grama	*Bouteloua curtipendula*
Alfalfa	*Medicago spp.*
Alsike Clover	*Trifolium hybridum*
Brown-eyed Susan	*Rudbeckia triloba*
Butterfly Milkweed	*Asclepias tuberosa*
Lanceleaf Coreopsis	*Coreopsis lanceolata*
Partridge Pea	*Chamaecrista fasciculata*
Timothy	*Phleum pratense*
Orchardgrass	*Dactylis glomerata*
Crimson Clover	*Trifolium incarnatum*
Ladino or White Clover	*Trifolium repens*

The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. If trees are present within the project area, and trees must be cut, the DOW recommends cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH $\geq$ 20 if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the "*OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE*

CLEARING". If state listed bats are documented, DOW recommends cutting only occur from October 1 through March 31, however, limited summer tree cutting may be acceptable after consultation with DOW (contact Sarah Stankavich, sarah.stankavich@dnr.state.oh.us).

The DOW also recommends that a desktop or field-based habitat assessment is conducted to determine if there are potential hibernaculum(a) present within the project area. Habitat assessments should be conducted in accordance with the current USFWS "*Range-wide Indiana Bat Survey Guidelines*" and submitted to Sarah Stankavich, sarah.stankavich@dnr.state.oh.us if potential hibernacula are present within .25 miles of the project area. If a potential hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol (2020), all Group 2, 3, and 4 streams (Appendix A) require a mussel survey. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 5 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2020) can be found at: http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/licenses%20&%20permits/OH%20Mussel%20Survey%20Protocol.pdf

The project is within the range the lake chubsucker (*Erimyzon sucetta*) a state threatened fish. The 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. If no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.

The project is within the range of the least bittern (*Ixobrychus exilis*), a state threatened bird. This secretive marsh species prefers dense emergent wetlands with thick stands of cattails, sedges, sawgrass or other semiaquatic vegetation interspersed with woody vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Geological Survey: The Division of Geological Survey has the following comment.

Physiographic Region

The proposed project area is in Harrison Township and on the border of Etna Township in Licking County. This area is in the Galion Glaciated Low Plateau physiographic region. This region is characterized by rolling uplands that transition between the gently rolling till plain and the hilly Glaciated Allegheny Plateau. Drift can range from thin to thick. A medium to low-lime Wisconsinan-age till overlies Mississippian-age shales and sandstones (Ohio Department of Natural Resources, Division of Geological Survey, 1998).

Surficial/Glacial Geology

The project area lies within the glaciated margin of the state and includes several Wisconsinan-age glacial features. Both end and ground moraine deposits are present in the project area. End moraine features make up the north and east portions of the project area and consist of loam till covered in thin loess. Terrain in this area consists of hummocky ridges higher than the adjacent terrain. The south and west portions of the project area are made up of ground moraine features including a silty loam till and flat to gently undulating terrain (Pavey et al, 1999). Glacial drift throughout most of the study area is between 64 and 419 feet thick. Drift is thickest in the north and thinner in the south (Powers and Swinford, 2004).

Bedrock Geology

The uppermost bedrock unit in the project area is the Logan Formation and Cuyahoga Formations Undivided. This unit is Mississippian-age and consists of interbedded shale and sandstone. This unit makes up almost the entirety of the project area. Underlying the Logan Formation and Cuyahoga Formations Undivided is the Lower Mississippian to Upper Devonian-age Sunbury and Bedford Formations Undivided. This unit is characterized by interbedded shales. Sunbury shale is brownish to greenish black and may be carbonaceous and pyritic. Bedford shale is gray to olive green and is often silty and clayey. This unit is the uppermost bedrock unit along parts of the northern border of the project area. Due to significant glacial drift, bedrock is not exposed in the project area (Slucher et al, 2006).

Oil, Gas and Mining

ODNR has record of 11 oil and gas wells within one mile of the proposed project area. Most of these wells are listed as plugged and abandoned (Ohio Department of Natural Resources, Division of Oil and Gas, *Ohio Oil and Gas Wells Locator*).

ODNR does not have record of any mining operations within the project area. The nearest mine to the project area is a sand and gravel quarry operated by York Road Gravel Company. This mine is located approximately 0.8 miles to the southeast of the site boundary (Ohio Department of Natural Resources, Division of Mineral Resources, *Mines of Ohio*).

Seismic Activity

Several small earthquakes have historically been recorded in central Ohio. The three events closest to the site are listed in the chart below (Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Earthquake Epicenters*):

Date	Magnitude	Distance to Site Boundary	County	Township
November 24, 2016	1.5	17.8	Fairfield	Pleasant
January 16, 1870	2.9	18.1	Fairfield	Berne
April 6, 1848	3.7	21.9	Fairfield	Berne

Karst

Karst features usually form in areas that are covered by thin or no glacial drift and the bedrock is limestone or dolomite. There are no known karst features in the project area (Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Karst*).

Soils

According to the USDA Web Soil Survey, the project area consists primarily of soils derived from glacial till, loess, outwash and alluvium. Centerburg, Pewamo and Bennington are the most common soil series found within the boundaries of the project area. Together these soils make up over 85% of the project area (USDA Web Soil Survey).

There is a low to moderate risk of shrink-swell potential in these soils. Other limiting factors include occasional flooding and seasonal saturation. Slope remains relatively flat, with slope seldom exceeding a 6% grade (USDA Web Soil Survey).

Groundwater

Groundwater resources vary throughout the project area. Wells developed in bedrock are likely to yield up to 25 gallons per minute (Hartzell, 1982 and Ohio Department of Natural Resources, Division of Water, *Bedrock Aquifer Map*, 2000). Wells developed in glacial material can yield up to 500 gallons per minute. The Johnstown-Groveport Complex Aquifer makes up the eastern portion of the project area and has an expected yield of less than five gallons per minute. The South Fork Licking Buried Valley Aquifer makes up the remainder of the project area. It has an expected yield of 5 to 25 gallons per minute in the northern portion of the project area and an expected yield of up to 500 gallons per minute in the south. Higher groundwater yields typically reflect larger diameter, properly developed and screened wells (Ohio Department of Natural Resources, Division of Water, *Statewide Unconsolidated Aquifer Map*, 2000).

ODNR has record of 243 water wells drilled within one mile of the project area. These wells range in depth from 32 to 410 feet deep, with an average depth of 130.7 feet. The most common aquifer listed is sand and gravel. Other aquifers listed include gravel, shale, sandstone and sand. A sustainable yield of 10 to 50 gallons per minute is expected from wells drilled in this area based on well log records. The average sustainable yield from these records within one mile was 22.4 gallons per minute. This is based on records from 16 wells within one mile of the project area that

contain sustainable yield data. There are two additional wells in this area that have yields of 615 and 1,265 gallons per minute. These wells are operated as public and municipal wells and are developed to produce more than domestic wells in this area (Ohio Department of Natural Resources, Division of Water, *Ohio Water Wells*).

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or Sarah.Tebbe@dnr.state.oh.us if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

References:

Hartzell, G. (1982). Groundwater Resources of Licking County, Ohio Department of Natural Resources, Division of Geological Survey, map.

Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Earthquake Epicenters,* online interactive map, https://gis.ohiodnr.gov/MapViewer/?config=earthquakes

Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Karst,* online interactive map, https://gis.ohiodnr.gov/website/dgs/karst_interactivemap/

Ohio Department of Natural Resources, Division of Geological Survey, (1998). *Physiographic Regions of Ohio.* Ohio Department of Natural Resources, Ohio Department of Natural Resources, Division of Geological Survey, map with text, 2 p., scale 1:2,100,000.

Ohio Department of Natural Resources, Division of Geological Survey, (In progress). *Statewide Surficial Geology Map.* GIS coverage.

Ohio Department of Natural Resources, Division of Mineral Resources, *Mines of Ohio,* online interactive map, https://gis.ohiodnr.gov/MapViewer/?config=OhioMines.

Ohio Department of Natural Resources, Division of Oil and Gas, *Ohio Oil and Gas Wells Locator*, online interactive map, https://gis.ohiodnr.gov/MapViewer/?config=oilgaswells.

Ohio Department of Natural Resources, Division of Water, *Ohio Water Wells,* online interactive map, https://gis.ohiodnr.gov/MapViewer/?config=waterwells.

Ohio Department of Natural Resources, Division of Water, (2000). *Statewide Bedrock Aquifer Map*, GIS coverage.

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Pavey, R., Goldthwait, R., Brockman, C.S. Hull, D., Swinford, E.M., and Van Horn, R. (1999). *Quaternary Geology of Ohio,* Ohio Department of Natural Resources, Division of Geological Survey, map, scale 1:500,000.

Powers, D.M., and Swinford, E.M. (2004). *Shaded drift-thickness map of Ohio*, Ohio Department of Natural Resources, Division of Geological Survey, map, scale 1:500,000

Slucher, E., Swinford, E., Larsen, G., Schumacher, G., Shrake, D., Rice, C., Caudill, M., Rea, R. and Powers, D. (2006). *Bedrock Geologic Map of Ohio,* Ohio Department of Natural Resources, Division of Geological Survey, map, scale 1:500,000.

USDA Web Soil Survey, (Last modified 2019). *Web Soil Survey Interactive Map,* United States Department of Agriculture, National Resources Conservation Service, online interactive map, https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Ohio Solar Site Pollinator Habitat Planning and Assessment Form

1. Percent of total site planted with native or beneficial introduced flowering plants.

☐	25-50%	10 points
☐	51-75%	20 points
☐	76-100%	30 points

2. Flowering plant diversity in site perimeter & buffer area (species with more than 1% cover).

☐	9-12 species	5 points
☐	13-16 species	10 points
☐	17-20 species	15 points
☐	20+ species	20 points
☐	Site specific Milkweed included @2,000 pls/ac minimum	10 points

* *If no boxes were selected in questions 1 or 2 then your site does not meet criteria to be considered as an OPHI Solar Pollinator Habitat. However, OPHI can work with you on ways to increase the pollinator score of your site.*

3. Flowering plant seed mixes and plantings to be used.
Native species local to the site are preferred; otherwise species native to Ohio are encouraged.

☐	Includes only native plant species	15 points
☐	Includes native and beneficial introduced plant species	10 points
☐	Includes only beneficial introduced plant species	5 points

4. Flowering plant diversity in rows & under solar array.

☐	4-6	5 points
☐	7+	10 points
☐	Site specific Milkweed included @2,000 pls/ac minimum	10 points

5. Seasons with at least 3 blooming species. Check all that apply.

☐	Spring *(April – May)*	5 points
☐	Summer *(June – August)*	5 points
☐	Fall *(September – October)*	5 points

6. Available habitat components within ¼ mile of site. Check all that apply.

☐	Native grasses	2 points
☐	Trees and shrubs	2 points
☐	Forest edge habitat	2 points
☐	Cavity nesting sites	2 points
☐	Clean perennial water sources	2 points

7. Planned vegetative buffers adjacent to the solar site. Check all that apply.

☐	Site has planned buffer adjacent to solar site	5 points
☐	Buffer is at least 30 feet wide as measured from array fencing or edge of flower plantings	5 points
☐	Buffer is at least 50 feet wide as measured from array fencing or edge of flower plantings	10 points
☐	Buffer includes flowering Shrubs/trees and other shrubs/trees that provide food for wildlife	5 points

8. Habitat site preparation prior to implementation.

☐	Measures taken to control weeds and invasive species prior to seeding/planting.	10 points
☐	Appropriate soil preparation done to reduce erosion And enhance germination/growth	5 points
☐	None	-10 points

9. Planned management practices for areas designated as part of the pollinator habitat site. Check all that apply.

☐	Detailed establishment and management plan developed for site	10 points
☐	Mowing Follows OPHI mowing schedule for monarchs each year	5 points
☐	Mowing is staggered over a 2 week period	5 points
☐	Signage indicating site is wildlife & pollinator-friendly	5 points
☐	Creation of habitat features (e.g. boxes, pass-through tunnels, bee hotels)	5 points
☐	Long-term monitoring plan developed that includes re-certification as Solar Site Pollinator Habitat	10 points

10. Insecticide risk. Check if applicable.
Communication with adjacent landowners about the project and possible impacts of their insecticide use is critical

☐	Site is adjacent to land (within 120 ft.) where insecticides are used	-20 points
☐	Planned on-site insecticide use (including pre-treated seeds/plants	-40 points

Total Points: 0 _____

Provides High Quality Pollinator Habitat	**> 85**
Meets OPHI Solar Pollinator Habitat Standards	**70-84**

Site Owner/Operator:

Project Location:

Project Size (acres):

Planned Source of Seeds:

Planned Seeding Date:

Habitat & Vegetation Consultant:

Refer to www.ophi.info for more information regarding solar pollinator habitat development.

Version 1 - March 2018
Developed by the OPHI Solar Pollinator Program Advisory Team

Ohio Pollinator Habitat Initiative

ATTACHMENT B

Threatened and Endangered Species Desktop Review

Licking County

Scientific Name	Common Name	Last Observed	State Status	Federal Status
Calopogon tuberosus	Grass-pink	2003-06-16	P	
Carex atlantica ssp. capillacea	Howe's Sedge	2011-06-16	P	
Carex decomposita	Cypress-knee Sedge	2011-06-26	E	
Carex limosa	Mud Sedge	2011-06-16	T	
Carex striatula	Lined Sedge	1991-05	E	
Cyperus diandrus	Low Umbrella-sedge	1991-09-27	P	
Cystopteris tennesseensis	Tennessee Bladder Fern	1982-06-03	P	
Eleocharis tenuis	Slender Spike-rush	2013-06-25	T	
Eriophorum virginicum	Tawny Cotton-grass	2011-06-16	T	
Eriophorum viridicarinatum	Green Cotton-grass	1964-06-24	P	
Huperzia appalachiana	Appalachian Club-moss	1982-04-26	X	
Menyanthes trifoliata	Buckbean	1992-05-06	T	
Moehringia lateriflora	Grove Sandwort	2011-05-11	P	
Myriophyllum sibiricum	American Water-milfoil	1962-07-13	E	
Pogonia ophioglossoides	Rose Pogonia	2011-06-16	T	
Potentilla arguta	Tall Cinquefoil	1964-07-13	E	
Rhynchospora alba	White Beak-rush	1991-09-27	P	
Rosa blanda	Smooth Rose	1961-07-25	P	
Scheuchzeria palustris	Scheuchzeria	1990-06-05	E	
Selaginella rupestris	Rock Spike-moss	1951-07	X	
Triphora trianthophora	Three-birds Orchid	1996-08-13	P	
Utricularia minor	Lesser Bladderwort	1977-08	T	

Ohio Division of Wildlife
Ohio Natural Heritage Database
Date Accessed: March 6, 2015
Status based on 2014-15 Rare Plant List.

Status:
X = Extirpated

Licking County

Scientific Name	Common Name	Last Observed	State Status	Federal Status
E = Endangered				
T = Threatened				
P = Potentially Threatened	List Created: July 2016			

Licking County State Listed Animal Species

Common Name	Scientific Name	Group	State Status	Federal Status
Eastern Hellbender	Cryptobranchus alleganiensis alleganiensis	Amphibian - Salamander	Endangered	
Upland Sandpiper	Bartramia longicauda	Bird	Endangered	
Northern Harrier	Circus hudsonius	Bird	Endangered	
Black Bear	Ursus americanus	Mammal	Endangered	
Longsolid	Fusconaia subrotunda	Mollusk	Endangered	
Sheepnose	Plethobasus cyphyus	Mollusk	Endangered	Endangered
Eastern Massasauga	Sistrurus catenatus	Reptile	Endangered	Threatened
Least Bittern	Ixobrychus exilis	Bird	Threatened	
Barn Owl	Tyto alba	Bird	Threatened	
Green-faced Clubtail	Gomphus viridifrons	Dragonfly	Threatened	
Lake Chubsucker	Erimyzon sucetta	Fish	Threatened	
Fawnsfoot	Truncilla donaciformis	Invert. - fw bivalve	Threatened	
Northern Long-eared Bat	Myotis septentrionalis	Mammal	Threatened	Threatened
Pondhorn	Uniomerus tetralasmus	Mollusk	Threatened	
Spotted Turtle	Clemmys guttata	Reptile	Threatened	
Four-toed Salamander	Hemidactylium scutatum	Amphibian	Species of Concern	
Eastern Cricket Frog	Acris crepitans crepitans	Amphibian - Frog / Toad	Species of Concern	
Sharp-shinned Hawk	Accipiter striatus	Bird	Species of Concern	
Henslow's Sparrow	Ammodramus henslowii	Bird	Species of Concern	
Grasshopper Sparrow	Ammodramus savannarum	Bird	Species of Concern	

Common Name	Scientific Name	Group	State Status	Federal Status
Great Egret	Ardea alba	Bird	Species of Concern	
Common Nighthawk	Chordeiles minor	Bird	Species of Concern	
Sedge Wren	Cistothorus platensis	Bird	Species of Concern	
Black-billed Cuckoo	Coccyzus erythropthalmus	Bird	Species of Concern	
Northern Bobwhite	Colinus virginianus	Bird	Species of Concern	
Bobolink	Dolichonyx oryzivorus	Bird	Species of Concern	
Red-headed Woodpecker	Melanerpes erythrocephalus	Bird	Species of Concern	
Vesper Sparrow	Pooecetes gramineus	Bird	Species of Concern	
Sora Rail	Porzana carolina	Bird	Species of Concern	
Prothonotary Warbler	Protonotaria citrea	Bird	Species of Concern	
Cerulean Warbler	Setophaga cerulea	Bird	Species of Concern	
Tiger Spiketail	Cordulegaster erronea	Dragonfly	Species of Concern	
Muskellunge	Esox masquinongy	Fish	Species of Concern	
Big Brown Bat	Eptesicus fuscus	Mammal	Species of Concern	
Red Bat	Lasiurus borealis	Mammal	Species of Concern	
Hoary Bat	Lasiurus cinereus	Mammal	Species of Concern	
Little Brown Bat	Myotis lucifugus	Mammal	Species of Concern	
Tri-colored Bat	Perimyotis subflavus	Mammal	Species of Concern	
Deer Mouse	Peromyscus maniculatus	Mammal	Species of Concern	
Badger	Taxidea taxus	Mammal	Species of Concern	
Common Gray Fox	Urocyon cinereoargenteus	Mammal	Species of Concern	
Eastern Box Turtle	Terrapene carolina carolina	Reptile - Turtle	Species of Concern	

Common Name	Scientific Name	Group	State Status	Federal Status
Northern Saw-whet Owl	Aegolius acadicus	Bird	Special Interest	
Veery	Catharus fuscescens	Bird	Special Interest	
Brown Creeper	Certhia americana	Bird	Special Interest	
Magnolia Warbler	Setophaga magnolia	Bird	Special Interest	
Evening Bat	Nycticeius humeralis	Mammal	Special Interest	

Change location | Year-round, All years

Pataskala Municipal Park

Map(/hotspots?hs=L5654391&yr=all&m=)

Directions(https://www.google.com/maps/search/?api=1&query=39.9907829,-82.6727468)

Licking County (/region/US-OH-089?yr=all&m=), Ohio (/region/US-OH?yr=all&m=), US (/region/US?yr=all&m=)

Hotspot navigation

Overview (/hotspot/L5654391?yr=all&m=)

Illustrated Checklist (/hotspot/L5654391/media?yr=all&m=)

VIEW MY...

My eBird (/myebird/L5654391)

Life List (/MyEBird?cmd=lifeList&time=life&listType=L5654391)

Target Species (/targets?r1=L5654391&bmo=1&emo=12)

EXPLORE...

Hotspot Map (/hotspots?hs=L5654391&yr=all&m=)

Bar Charts (/barchart?r=L5654391&yr=all&m=)

Media (https://ebird.org/media/catalog?regionCode=L5654391)

Printable Checklist (/printableList?regionCode=L5654391&yr=all&m=)

62
Species observed (/hotspot/L5654391?yr=all&m=)

14
Complete checklists (/hotspot/L5654391/activity?yr=all&m=)

Sightings

Updated 5 sec ago.

Last seen (/hotspot/L5654391?yr=all&m=&rank=mrec) | **First seen (/hotspot/L5654391?yr=all&m=&rank=lrec)** | **High counts (/hotspot/L5654391?yr=all&m=&rank=hc)**

Show all details | Sort by

SPECIES NAME (/HOTSPOT/L5654391?YR=ALL&M=&RANK=MREC&HS_SORTBY=TAXON_ORDER&HS_O=ASC)		
COUNT (/HOTSPOT/L5654391?YR=ALL&M=&RANK=MREC&HS_SORTBY=OBS_COUNT&HS_O=DESC)	DATE (/HOTSPOT/L5654391?YR=ALL&M=&RANK=MREC&HS_SORTBY=DATE&HS_O=ASC)	OBSERVER

1. **Mallard(/species/mallar3/L5654391)**
   # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
2. **Mourning Dove(/species/moudov/L5654391)**
   # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
3. **Turkey Vulture(/species/turvul/L5654391)**
   # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
4. **Red-shouldered Hawk(/species/reshaw/L5654391)**
   # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
5. **Red-headed Woodpecker(/species/rehwoo/L5654391)**
   # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
6. **Red-bellied Woodpecker(/species/rebwoo/L5654391)**
   # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
7. **Downy Woodpecker(/species/dowwoo/L5654391)**
   # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
8. **Northern Flicker(/species/norfli/L5654391)**
   # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
9. **Eastern Wood-Pewee(/species/eawpew/L5654391)**
   # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
10. **Red-eyed Vireo(/species/reevir1/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
11. **Blue Jay(/species/blujay/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
12. **American Crow(/species/amecro/L5654391)**
    # 3 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
13. **Carolina Chickadee(/species/carchi/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
14. **White-breasted Nuthatch(/species/whbnut/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
15. **House Wren(/species/houwre/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
16. **Carolina Wren(/species/carwre/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn
17. **European Starling(/species/eursta/L5654391)**
    # 15 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

18. **Gray Catbird(/species/grycat/L5654391)**
    # 3 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

19. **Eastern Bluebird(/species/easblu/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

20. **American Robin(/species/amerob/L5654391)**
    # 10 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

21. **Cedar Waxwing(/species/cedwax/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

22. **House Sparrow(/species/houspa/L5654391)**
    # 6 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

23. **House Finch(/species/houfin/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

24. **American Goldfinch(/species/amegfi/L5654391)**
    # 3 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

25. **Chipping Sparrow(/species/chispa/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

26. **Song Sparrow(/species/sonspa/L5654391)**
    # 2 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

27. **Baltimore Oriole(/species/balori/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

28. **Brown-headed Cowbird(/species/bnhcow/L5654391)**
    # 3 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

29. **Yellow-throated Warbler(/species/yetwar/L5654391)**
    # 1 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

30. **Northern Cardinal(/species/norcar/L5654391)**
    # 4 | 15 Jun 2020 (/checklist/S70581094) | Robert Thorn

31. **Pileated Woodpecker(/species/pilwoo/L5654391)**
    # 3 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

    Carolina/Black-capped Chickadee
    # 6 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

32. **Field Sparrow(/species/fiespa/L5654391)**
    # 5 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

33. **American Tree Sparrow(/species/amtspa/L5654391)**
    # 10 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

34. **Red-winged Blackbird(/species/rewbla/L5654391)**

2 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

blackbird sp.

10 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

passerine sp.

1 | 16 Feb 2020 (/checklist/S64596380) | Anonymous eBirder

35. **Tree Swallow(/species/treswa/L5654391)**

2 | 24 Oct 2019 (/checklist/S60896183) | Margaret Bowman

36. **Common Grackle(/species/comgra/L5654391)**

10 | 24 Oct 2019 (/checklist/S60896183) | Margaret Bowman

37. **Black Vulture(/species/blkvul/L5654391)**

2 | 17 Oct 2019 (/checklist/S60689469) | Margaret Bowman

38. **Red-tailed Hawk(/species/rethaw/L5654391)**

1 | 17 Oct 2019 (/checklist/S60689469) | Margaret Bowman

39. **Tufted Titmouse(/species/tuftit/L5654391)**

2 | 17 Oct 2019 (/checklist/S60689469) | Margaret Bowman

40. **Chimney Swift(/species/chiswi/L5654391)**

2 | 13 Aug 2019 (/checklist/S58963055) | Margaret Bowman

41. **Purple Martin(/species/purmar/L5654391)**

2 | 13 Aug 2019 (/checklist/S58963055) | Margaret Bowman

42. **Northern Parula(/species/norpar/L5654391)**

1 | 13 Aug 2019 (/checklist/S58963055) | Margaret Bowman

43. **Cooper's Hawk(/species/coohaw/L5654391)**

1 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

44. **Belted Kingfisher(/species/belkin1/L5654391)**

1 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

45. **Yellow-throated Vireo(/species/yetvir/L5654391)**

1 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

46. **Blue-gray Gnatcatcher(/species/buggna/L5654391)**

1 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

47. **Common Yellowthroat(/species/comyel/L5654391)**

1 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

48. **Indigo Bunting(/species/indbun/L5654391)**

3 | 26 Jun 2019 (/checklist/S57706074) | Margaret Bowman

49. **Hairy Woodpecker(/species/haiwoo/L5654391)**

1 | 11 Jun 2019 (/checklist/S57409096) | Robert Thorn

1 11 Jun 2019 (/checklist/S57409096) Robert Thorn

50. **Northern Rough-winged Swallow(/species/nrwswa/L5654391)**
1 11 Jun 2019 (/checklist/S57409096) Robert Thorn

51. **Brown Creeper(/species/brncre/L5654391)**
1 13 Nov 2018 (/checklist/S50245599) Robert Thorn

52. **Tennessee Warbler(/species/tenwar/L5654391)**
1 5 Oct 2018 (/checklist/S49431707) Robert Thorn

53. **Bay-breasted Warbler(/species/babwar/L5654391)**
1 5 Oct 2018 (/checklist/S49431707) Robert Thorn

54. **Great Blue Heron(/species/grbher3/L5654391)**
1 25 Jul 2017 (/checklist/S38520769) Robert Thorn

55. **Great Crested Flycatcher(/species/grcfly/L5654391)**
2 25 Jul 2017 (/checklist/S38520769) Robert Thorn

56. **Barn Swallow(/species/barswa/L5654391)**
3 25 Jul 2017 (/checklist/S38520769) Robert Thorn

57. **Golden-crowned Kinglet(/species/gockin/L5654391)**
2 4 Apr 2017 (/checklist/S35694536) Alan Green

58. **Ruby-crowned Kinglet(/species/ruckin/L5654391)**
1 4 Apr 2017 (/checklist/S35694536) Alan Green

59. **Eastern Towhee(/species/eastow/L5654391)**
2 4 Apr 2017 (/checklist/S35694536) Alan Green

60. **Acadian Flycatcher(/species/acafly/L5654391)**
2 11 Jul 2013 (/checklist/S59093691) Robert Thorn

Show all sightings

Top media UPLOADED IN LAST 30 DAYS

No media submitted

Latest media (https://ebird.org/media/catalog?regionCode=L5654391)

Recent visits

OBSERVER	DATE	SPECIES
Robert Thorn	15 Jun 2020 (/checklist/S70581094)	30
Margaret Bowman	24 Oct 2019 (/checklist/S60896183)	15
Margaret Bowman	17 Oct 2019 (/checklist/S60689469)	16
Margaret Bowman	7 Oct 2019 (/checklist/S60427320)	11
Margaret Bowman	13 Aug 2019 (/checklist/S58963055)	15
Margaret Bowman	26 Jun 2019 (/checklist/S57706074)	32
Robert Thorn	11 Jun 2019 (/checklist/S57409096)	27
Robert Thorn	8 May 2019 (/checklist/S56426305)	26
Robert Thorn	13 Nov 2018 (/checklist/S50245599)	7
Robert Thorn	5 Oct 2018 (/checklist/S49431707)	21

Checklists submitted within the last hour are not shown.

More recent visits (/hotspot/L5654391/activity?yr=all&m=)

Top eBirders

Updated 5 sec ago.

Species (/hotspot/L5654391?yr=all&m=&sortBy=spp) **Checklists (/hotspot/L5654391?yr=all&m=&sortBy=cl)**

1	Robert Thorn		47
2	Margaret Bowman	42	
3	Alan Green	14	

Change location | Year-round, All years

Thomas J. Evans Foundation Park, Pataskala

Map(/hotspots?hs=L4911069&yr=all&m=)

Directions(https://www.google.com/maps/search/?api=1&query=40.0138352,-82.6797152)

Licking County (/region/US-OH-089?yr=all&m=), Ohio (/region/US-OH?yr=all&m=), US (/region/US?yr=all&m=)

Hotspot navigation

Overview (/hotspot/L4911069?yr=all&m=)

Illustrated Checklist (/hotspot/L4911069/media?yr=all&m=)

VIEW MY...

My eBird (/myebird/L4911069)

Life List (/MyEBird?cmd=lifeList&time=life&listType=L4911069)

Target Species (/targets?r1=L4911069&bmo=1&emo=12)

EXPLORE...

Hotspot Map (/hotspots?hs=L4911069&yr=all&m=)

Bar Charts (/barchart?r=L4911069&yr=all&m=)

Media (https://ebird.org/media/catalog?regionCode=L4911069)

Printable Checklist (/printableList?regionCode=L4911069&yr=all&m=)

89
Species observed (/hotspot/L4911069?yr=all&m=)

20
Complete checklists (/hotspot/L4911069/activity?yr=all&m=)

Sightings

Updated 4 sec ago.

Last seen (/hotspot/L4911069?yr=all&m=&rank=mrec) **First seen (/hotspot/L4911069?yr=all&m=&rank=lrec)**

High counts (/hotspot/L4911069?yr=all&m=&rank=hc)

Show all details Sort by

SPECIES NAME (/HOTSPOT/L4911069?YR=ALL&M=&RANK=MREC&HS_SORTBY=TAXON_ORDER&HS_O=ASC)
COUNT (/HOTSPOT/L4911069?YR=ALL&M=&RANK=MREC&HS_SORTBY=COUNT&HS_O=DESC)
DATE (/HOTSPOT/L4911069?YR=ALL&M=&RANK=MREC&HS_SORTBY=DATE&HS_O=ASC)
OBSERVER

1. **Mallard(/species/mallar3/L4911069)**
   # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
2. **Mourning Dove(/species/moudov/L4911069)**
   # 2 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
3. **Turkey Vulture(/species/turvul/L4911069)**
   # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
4. **Red-bellied Woodpecker(/species/rebwoo/L4911069)**
   # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
5. **Downy Woodpecker(/species/dowwoo/L4911069)**
   # 3 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
6. **Hairy Woodpecker(/species/haiwoo/L4911069)**
   # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
7. **Eastern Wood-Pewee(/species/eawpew/L4911069)**
   # 2 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
8. **Acadian Flycatcher(/species/acafly/L4911069)**
   # 3 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
9. **Red-eyed Vireo(/species/reevir1/L4911069)**
   # 3 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
10. **Blue Jay(/species/blujay/L4911069)**
    # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
11. **American Crow(/species/amecro/L4911069)**
    # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
12. **Tufted Titmouse(/species/tuftit/L4911069)**
    # 2 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
13. **Barn Swallow(/species/barswa/L4911069)**
    # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
14. **White-breasted Nuthatch(/species/whbnut/L4911069)**
    # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
15. **Blue-gray Gnatcatcher(/species/buggna/L4911069)**
    # 1 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn
16. **House Wren(/species/houwre/L4911069)**
    # 3 | 15 Jun 2020 (/checklist/S70581217) | Robert Thorn

3 15 Jun 2020 (/checklist/S70581217) Robert Thorn

17. **Carolina Wren(/species/carwre/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
18. **European Starling(/species/eursta/L4911069)**
    # 10 15 Jun 2020 (/checklist/S70581217) Robert Thorn
19. **Gray Catbird(/species/grycat/L4911069)**
    # 3 15 Jun 2020 (/checklist/S70581217) Robert Thorn
20. **Wood Thrush(/species/woothr/L4911069)**
    # 1 15 Jun 2020 (/checklist/S70581217) Robert Thorn
21. **American Robin(/species/amerob/L4911069)**
    # 14 15 Jun 2020 (/checklist/S70581217) Robert Thorn
22. **Cedar Waxwing(/species/cedwax/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
23. **House Sparrow(/species/houspa/L4911069)**
    # 5 15 Jun 2020 (/checklist/S70581217) Robert Thorn
24. **House Finch(/species/houfin/L4911069)**
    # 5 15 Jun 2020 (/checklist/S70581217) Robert Thorn
25. **American Goldfinch(/species/amegfi/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
26. **Chipping Sparrow(/species/chispa/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
27. **Song Sparrow(/species/sonspa/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
28. **Eastern Towhee(/species/eastow/L4911069)**
    # 1 15 Jun 2020 (/checklist/S70581217) Robert Thorn
29. **Brown-headed Cowbird(/species/bnhcow/L4911069)**
    # 4 15 Jun 2020 (/checklist/S70581217) Robert Thorn
30. **Northern Parula(/species/norpar/L4911069)**
    # 2 15 Jun 2020 (/checklist/S70581217) Robert Thorn
31. **Northern Cardinal(/species/norcar/L4911069)**
    # 7 15 Jun 2020 (/checklist/S70581217) Robert Thorn
32. **Indigo Bunting(/species/indbun/L4911069)**
    # 1 15 Jun 2020 (/checklist/S70581217) Robert Thorn
33. **Chimney Swift(/species/chiswi/L4911069)**

1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

34. **Red-shouldered Hawk(/species/reshaw/L4911069)**
1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

35. **Belted Kingfisher(/species/belkin1/L4911069)**
1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

36. **Pileated Woodpecker(/species/pilwoo/L4911069)**
1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

37. **Eastern Phoebe(/species/easpho/L4911069)**
1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

38. **Carolina Chickadee(/species/carchi/L4911069)**
2 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

39. **Tree Swallow(/species/treswa/L4911069)**
8 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

40. **Eastern Bluebird(/species/easblu/L4911069)**
2 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

41. **Eastern Meadowlark(/species/easmea/L4911069)**
1 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

42. **Red-winged Blackbird(/species/rewbla/L4911069)**
4 | 25 Apr 2020 (/checklist/S67793128) | Joe Hammond

43. **Sharp-shinned Hawk(/species/shshaw/L4911069)**
1 | 24 Oct 2019 (/checklist/S60896127) | Margaret Bowman

44. **Red-tailed Hawk(/species/rethaw/L4911069)**
1 | 24 Oct 2019 (/checklist/S60896127) | Margaret Bowman

45. **Northern Flicker(/species/norfli/L4911069)**
1 | 24 Oct 2019 (/checklist/S60896127) | Margaret Bowman

46. **Killdeer(/species/killde/L4911069)**
5 | 22 Sep 2019 (/checklist/S60124157) | Cory "Chia" Chiappone

47. **Cooper's Hawk(/species/coohaw/L4911069)**
1 | 22 Sep 2019 (/checklist/S60124157) | Cory "Chia" Chiappone

48. **American Redstart(/species/amered/L4911069)**
1 | 22 Sep 2019 (/checklist/S60124157) | Cory "Chia" Chiappone

49. **Magnolia Warbler(/species/magwar/L4911069)**
1 | 22 Sep 2019 (/checklist/S60124157) | Cory "Chia" Chiappone

50. **Scarlet Tanager(/species/scatan/L4911069)**

1 22 Sep 2019 (/checklist/S60124157) Cory "Chia" Chiappone

51. **Barred Owl(/species/brdowl/L4911069)**
2 30 Aug 2019 (/checklist/S59597562) Robert Thorn

52. **Northern Rough-winged Swallow(/species/nrwswa/L4911069)**
4 30 Aug 2019 (/checklist/S59597562) Robert Thorn

53. **Purple Martin(/species/purmar/L4911069)**
1 30 Aug 2019 (/checklist/S59597562) Robert Thorn

54. **Brown Thrasher(/species/brnthr/L4911069)**
1 30 Aug 2019 (/checklist/S59597562) Robert Thorn

55. **Red-headed Woodpecker(/species/rehwoo/L4911069)**
1 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

56. **Great Crested Flycatcher(/species/grcfly/L4911069)**
1 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

57. **Eastern Kingbird(/species/easkin/L4911069)**
1 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

58. **Common Grackle(/species/comgra/L4911069)**
5 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

59. **Common Yellowthroat(/species/comyel/L4911069)**
1 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

60. **Rose-breasted Grosbeak(/species/robgro/L4911069)**
1 25 Jun 2019 (/checklist/S57676034) Margaret Bowman

61. **Ruby-throated Hummingbird(/species/rthhum/L4911069)**
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

62. **Great Blue Heron(/species/grbher3/L4911069)**
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

Sharp-shinned/Cooper's Hawk
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

63. **White-eyed Vireo(/species/whevir/L4911069)**
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

64. **Yellow-throated Vireo(/species/yetvir/L4911069)**
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

65. **Field Sparrow(/species/fiespa/L4911069)**
1 13 May 2019 (/checklist/S56232202) Steve Wheeler

66. **Tennessee Warbler(/species/tenwar/L4911069)**

1 | 13 May 2019 (/checklist/S56232202) | Steve Wheeler

67. **Hooded Warbler(/species/hoowar/L4911069)**
1 | 13 May 2019 (/checklist/S56232202) | Steve Wheeler

68. **Yellow Warbler(/species/yelwar/L4911069)**
2 | 13 May 2019 (/checklist/S56232202) | Steve Wheeler

69. **Yellow-rumped Warbler(/species/yerwar/L4911069)**
1 | 13 May 2019 (/checklist/S56232202) | Steve Wheeler

warbler sp. (Parulidae sp.)
2 | 13 May 2019 (/checklist/S56232202) | Steve Wheeler

70. **Cerulean Warbler(/species/cerwar/L4911069)**
1 | 8 May 2019 (/checklist/S56426443) | Robert Thorn

71. **Yellow-throated Warbler(/species/yetwar/L4911069)**
1 | 8 May 2019 (/checklist/S56426443) | Robert Thorn

72. **Canada Goose(/species/cangoo/L4911069)**
2 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

73. **Wood Duck(/species/wooduc/L4911069)**
2 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

74. **Northern Mockingbird(/species/normoc/L4911069)**
5 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

75. **Baltimore Oriole(/species/balori/L4911069)**
2 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

76. **Black-and-white Warbler(/species/bawwar/L4911069)**
1 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

77. **Nashville Warbler(/species/naswar/L4911069)**
1 | 3 May 2019 (/checklist/S55733607) | Joe Hammond

78. **Dark-eyed Junco(/species/daejun/L4911069)**
5 | 25 Feb 2019 (/checklist/S53305004) | Robert Thorn

79. **Brown Creeper(/species/brncre/L4911069)**
1 | 13 Nov 2018 (/checklist/S50245563) | Robert Thorn

80. **Yellow-bellied Sapsucker(/species/yebsap/L4911069)**
1 | 5 Oct 2018 (/checklist/S49431586) | Robert Thorn

81. **Ruby-crowned Kinglet(/species/ruckin/L4911069)**
1 | 5 Oct 2018 (/checklist/S49431586) | Robert Thorn

82. **White-throated Sparrow(/species/whtspa/L4911069)**

	# 3	5 Oct 2018 (/checklist/S49431586)	Robert Thorn

83. **Yellow-billed Cuckoo(/species/yebcuc/L4911069)**

# 1	25 Jun 2018 (/checklist/S57521189)	Robert Thorn

84. **Hermit Thrush(/species/herthr/L4911069)**

# 1	26 Oct 2017 (/checklist/S40428663)	Robert Thorn

85. **Swamp Sparrow(/species/swaspa/L4911069)**

# 1	26 Oct 2017 (/checklist/S40428663)	Robert Thorn

86. **Black Vulture(/species/blkvul/L4911069)**

# 1	19 Sep 2017 (/checklist/S39359869)	Robert Thorn

87. **Swainson's Thrush(/species/swathr/L4911069)**

# 1	19 Sep 2017 (/checklist/S39359869)	Robert Thorn

88. **Bay-breasted Warbler(/species/babwar/L4911069)**

# 1	19 Sep 2017 (/checklist/S39359869)	Robert Thorn

Show all sightings

Top media UPLOADED IN LAST 30 DAYS

No media submitted

Latest media (https://ebird.org/media/catalog?regionCode=L4911069)

Recent visits

OBSERVER	DATE	SPECIES
Robert Thorn	15 Jun 2020 (/checklist/S70581217)	32
Joe Hammond	25 Apr 2020 (/checklist/S67793128)	31
Margaret Bowman	24 Oct 2019 (/checklist/S60896127)	13
Cory "Chia" Chiappone	22 Sep 2019 (/checklist/S60124157)	21
Robert Thorn	30 Aug 2019 (/checklist/S59597562)	30
Margaret Bowman	25 Jun 2019 (/checklist/S57676034)	38
Steve Wheeler	13 May 2019 (/checklist/S56232202)	41
Robert Thorn	8 May 2019 (/checklist/S56426443)	29
Joe Hammond	3 May 2019 (/checklist/S55733607)	43
Robert Thorn	25 Feb 2019 (/checklist/S53305004)	12

Robert Thorn 23 Feb 2019 (/checklist/S55505004) 12

Checklists submitted within the last hour are not shown.

More recent visits (/hotspot/L4911069/activity?yr=all&m=)

Top eBirders

Updated 4 sec ago.

Species (/hotspot/L4911069?yr=all&m=&sortBy=spp) **Checklists (/hotspot/L4911069?yr=all&m=&sortBy=cl)**

1	Robert Thorn	77
2	Joe Hammond	50
3	Steve Wheeler	41
3	Margaret Bowman	41
5	Cory "Chia" Chiappone	21

ATTACHMENT C

Surface Water Delineation Report and Forms

SURFACE WATER DELINEATION REPORT

FOR THE:
UNION RIDGE SOLAR PROJECT
LICKING COUNTY, OHIO

ENVIRONMENTAL DESIGN & RESEARCH, LANDSCAPE ARCHITECHTURE, ENGINEERING, & ENVIRONMENTAL SERVICES, D.P.C.
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JANUARY 2021

HULL
Environment / Energy / Infrastructure

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1.0 INTRODUCTION

Union Ridge Solar, LLC (Union Ridge) is proposing to construct a solar farm and associated infrastructure on 505 acres (approximately) of land in central Ohio (Project). The Project is located approximately 1.2 miles southeast of Pataskala in Licking County, Ohio (Figure 1). Hull & Associates, LLC (Hull) was contracted by Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) to conduct a surface water delineation of wetlands and waterbodies within an 504.9-acre survey boundary (Project Area). The purpose of the surface water delineation was to determine the extent and quality of surface waters within the Project Area that may be subject to regulation under Rivers and Harbors Act of 1899, Section 10; Clean Water Act (CWA), Sections 401 and 404; Code of Federal Regulations (CFR), Title 33 Parts 328 and 329; Executive Order 11990; National Environmental Policy Act (NEPA); and Ohio Revised Code (ORC), Sections 6111.03, 6111.021, and 6111.022. This report summarizes the methodologies and results of the surface water delineation for the Project.

2.0 SURFACE WATER DELINEATION CRITERIA

A surface water delineation involves the identification of wetlands, streams, and other relatively permanent open water features subject to federal and/or state jurisdiction.

2.1 Wetland Criteria

Federal regulations define wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987).

Ohio regulations define wetlands as:

> *"those areas that are inundated or saturated by surface or ground water at a frequency and duration that are sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. "Wetlands" includes swamps, marshes, bogs, and similar areas that are delineated in accordance with the 1987 United States army corps of engineers wetland delineation manual and any other procedures and requirements adopted by the United States army corps of engineers for delineating wetlands (3745-1-02 OAC)."*

According to current regulatory wetland criteria, a wetland must have hydric soils, evidence of inundated or saturated conditions, and a predominance of hydrophytic vegetation. When all three of these criteria are met, a wetland is present and is subject to federal and/or state regulations and permitting.

Hydric soils are those that have formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil column (Environmental Laboratory, 1987). The presence or absence of hydric soils is determined in the field by digging a soil pit or bore sample, characterizing the soil profile, and applying the criteria for hydric soils contained in Field Indicators of Hydric Soils in the United States, Version 8.2 (2018).

Wetland hydrology refers to a landscape which is periodically inundated or has soils that are saturated to the surface during the growing season with a duration that influences the vegetative community because of the development of anaerobic soil conditions (Environmental Laboratory, 1987). The presence of wetland hydrology is determined using field indicators including directly observable evidence such as inundation and soil saturation, and evidence of recent inundation such as water marks on trees and sediment or drift deposits.

Evidence of current or recent soil saturation may also be present, such as the presence of reduced iron or crayfish burrows.

Hydrophytic vegetation is described by the USACE as the community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrences (Environmental Laboratory, 1987). Plants are placed into indicator status categories depending on their probability of occurring in a wetland. These categories were originally developed and defined by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and subsequently have been modified by the National Plant List Panel. There are five indicator status categories for plants:

1. Obligate wetland plants (OBL) almost always occur in wetlands;
2. Facultative wetland plants (FACW) usually occur in wetlands but may occur in non-wetlands;
3. Facultative plants (FAC) occur in both wetlands and non-wetlands;
4. Facultative upland plants (FACU) occur usually occur in non-wetlands, but may occur in wetlands; and
5. Upland plants (UPL) almost never occur in wetlands.

2.2 Stream Criteria

The location and length of each stream channel is determined from existing mapping information and/or via surveying streams in the field. Note that some streams that are too small to be included on U.S. Geological Survey (USGS) topographic maps may nevertheless be under CWA jurisdiction. Jurisdictional streams generally have a defined channel, an Ordinary High-Water Mark (OHWM), and discernible bed and bank features. Streams may have other morphological features including riffles and pools, meanders, and a floodplain.

2.3 Jurisdictional Determination

The U.S. Army Corps of Engineers (USACE) has sole authority to determine whether wetlands or other water bodies are non-isolated (federal jurisdiction) or isolated (Ohio EPA jurisdiction). Determinations made by Hull must be verified by the USACE after review of a delineation report and a field visit by USACE staff. Delineations are typically valid for a period of five years from the date of the USACE delineation verification letter. This report contains a description of an investigation conducted to delineate and to assess the value of surface waters found within the Project Area. The report includes descriptions of the field methods used during the surface water delineation, a summary of resources found within the Project Area, and a description of the limitations of this investigation.

3.0 INVESTIGATION METHODS

3.1 General

Prior to visiting the Project Area, Hull reviewed the following existing information.

- **Natural Resources Conservation Service (NRCS) Soil Survey of Licking County, Ohio**

  The soil survey identifies soil mapping units within the Project Area, including hydric soil mapping units, non-hydric soil mapping units that may contain inclusions of hydric soil units, and non-hydric soil mapping units (Figure 4). Non-hydric soil mapping units that may contain inclusions of hydric soil units can occur on terraces, in depressions, on floodplains, and in drainage ways.

- **United States Department of Interior National Wetlands Inventory (NWI) Maps**

  These data provide an indication of the presence of wetland and open-water areas as defined by the USFWS classification system (Cowardin et al., 1979). The notation of a wetland on an NWI Map indicates that wetlands might occur or have occurred in the area. Often, those wetlands depicted on NWI maps are the wettest spots in an area. NWI map information is used to supplement knowledge about a site and cannot take the place of field observations due to minimal ground truthing, age of the map, mapping scale, and wetlands criteria that differ from USACE wetlands criteria (Figure 3).

Hull used this preliminary information to screen the Project Area and target the investigation to areas that would likely contain surface water features, although all areas were evaluated.

3.2 Wetland Delineation Methods

Wetland edges were located in the field using procedures outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *2012 Regional Supplement to the Delineation Manual for the Midwest Region* Version 2.0, subsequent USACE memoranda and regulatory guidance, and basic principles of plant community ecology.

The plant communities identified within the Project Area were investigated in detail using the three-criterion wetland delineation approach. The wetland indicator status of plant species was determined using the *National Wetland Plant List* (Lichvar et al., 2018). After characterizing the vegetation, hydrology, and soils of a plant community type and becoming familiar with the soil, vegetation, and/or hydrologic cues that indicated the upland-wetland boundary, Hull recorded the wetland boundaries using Global Positioning System (GPS) technology and took periodic collection of additional soil, vegetation, or hydrologic data to refine the upland-wetland break. A data point was collected in each wetland or wetland mosaic and there was a corresponding upland data point taken outside of the wetland boundary, which was used to describe the upland community surrounding the wetland.

3.3 Wetland Evaluation Methods

Hull performed an evaluation of wetlands mapped within the Project Area using the Ohio Rapid Assessment Method for Wetlands (Mack, 2001), Final Version 5.0 (ORAM). The ORAM value assessment is based on review of resource materials, data obtained in the field, and the acreage as determined by delineation and mapping. The wetland value information is provided to the Ohio EPA during permitting coordination for the purpose of placing wetlands into the appropriate wetland Antidegradation Category described in Ohio's Wetland Water Quality Standards (Sections 3745-1-05 and Sections 3745-1-50 through 3745-1-54).

There are three possible Ohio Wetland Antidegradation Categories to which wetlands may be assigned:

- Category 1 – **Lowest value category.** Generally limited to small, low-diversity wetlands and wetlands with a predominance of non-native invasive species.
- Category 2 – **Middle value category.** Wetlands in this category are of moderate diversity but do not contain rare, threatened, or endangered species. They are generally degraded but are capable of attaining higher value. Most wetlands in Ohio are expected to fall into this category.
- Category 3 – **Highest value category.** Wetlands in this category may be large; diverse; represent rare plant community types; contain rare, threatened or endangered species; or any combination of these and several other factors.

3.4 Stream Channel Delineation Methods

Stream channels identified on USGS topographic maps are generally found to be under the CWA jurisdiction of the USACE (Figure 1: *Project Area Location Map*). Additional streams may be identified in the field by the presence of an OHWM, defined bed and bank, and other stream morphological features. The USACE Regulatory Guidance Letter No. 05-05 provides guidance for identifying the OHWM. Where possible, stream channels are investigated upstream to identify the source of water and downstream to determine if the channel ends in a wetland, a confluence with another stream, a culvert inlet, or another resource.

3.5 Stream Evaluation Methods

Hull utilizes the Ohio Qualitative Habitat Evaluation Index (QHEI) scoring method to evaluate streams with a drainage area greater than one square-mile and/or pools greater than 40 centimeters deep. On streams with a drainage area less than one square mile and with pools less than or equal to 40 centimeters deep, Hull uses the Ohio Headwater Habitat Evaluation Index (HHEI) and other physical observations. These methods yield a numerical score for the stream reach evaluated, which in combination with other physical observation data, is used to estimate the habitat quality of each stream.

The boundaries of the Project Area are evaluated utilizing the Ohio EPA Stream Eligibility Web Map (OEPA, 2017) to determine if the stream is eligible for coverage under the 401 Water Quality Certification (WQC)

for the Nationwide Permit (NWP) or if an individual 401 WQC or Ohio EPA Director's Authorization is required. At stream locations in possibly eligible areas where surface water is present, pH values are taken utilizing an Oakton pH2+ pen meter. Hull utilizes the flow charts provided by Ohio EPA to clarify when streams that score high on the HHEI or QHEI, and are mapped in possibly eligible areas, may be subject to individual 401 WQC or Director's Authorization procedures.

3.6 Surveying and Mapping Methods

Once delineated using the three-criterion approach, the wetland/non-wetland boundaries and the sample locations are surveyed, and a map is produced. The boundaries of all wetland areas, sample points, and streams are located in the field using Trimble R1 mapping-level portable GPS receivers. Differentially corrected GPS data are typically accurate within 0.5 foot to 1.0 foot. All wetland areas, sample points, and stream locations are placed in a Geographical Information System (GIS) database and assembled with other available geographically referenced information using ArcMap v.10.8.1 GIS software. The length of each streams and acreage of each wetland is calculated using GIS.

4.0 RESULTS

The USGS Pataskala and Millersport Quadrangles map shows sloping towards Stream 1, an unnamed tributary of the South Fork Licking River, as prevalent in the northeast corner of the Project Area and sloping towards the South Fork Licking River as prevalent in the remainder of the Project Area (Figure 1). The Project Area contains a predominance of active agricultural fields, some forested riparian corridor, and some forested woodlot. The terrain within and surrounding the Project Area consists of only slight undulation with most areas being flat.

The Project Area has been shaped by a history of agricultural production. Evidence of historic and recent tiling and modifications to natural hydrology was observed throughout the Project Area. Several grassy swales are believed to be remnant of historic stream channels and were investigated for the presence of stream or wetland features. The eastern half of the Project Area was dominated by soybean crop (*Glycine max*) and the western half was dominated by corn crop (*Zea mays*). Soils throughout the site varied from non-hydric, to non-hydric with hydric inclusions, to hydric (Figure 4).

To refine the information gathered during the desktop review, Hull collected hydrology, soil, and vegetation data at 27 locations throughout the Project Area (Table 1 in Appendix A and Appendix B). These data were used to develop surface water delineation maps (Figures 5 and 5A-5G). Hull has made an initial determination of jurisdiction for all delineated surface waters based on our professional experience. For regulatory purposes, final verification of the wetland and waterbody boundaries and their jurisdiction can only be established through a Jurisdictional Determination (JD) review by the USACE. All surface waters identified within the Project Area are located within the Licking Watershed (05040006). The regulatory floodway and 100-year floodplain of the South Fork Lick River traverse the southwest porting of the Project Area along the length of the river (Figure 7). The Project Area is located within an area that is "Eligible" for permitting through the Ohio 401 WQC for the USACE Nationwide Permits (Figure 8).

4.1 Wetlands in the Project Area

A total of 9 wetlands were delineated at the site, comprising a total of 5.779 acres within the Project Area (Table 2 in Appendix A). Eight of these wetlands were determined to be either abutting or adjacent to relatively permanent surface waters, likely making them federally jurisdictional under the current federal guidelines (33 CFR Part 328). One wetland was determined to be non-abutting or adjacent to relatively permanent waters, likely making it non-jurisdictional under federal the current federal guidelines (33 CFR Part 328). Because isolated wetlands are regulated in Ohio, these wetlands would likely fall under the jurisdiction of the state (3745-1-02 OAC and 3745-1-50 OAC). Of all the wetlands, five were evaluated as Category 1 and four were evaluated as Category 2 (Appendix C).

4.2 Waterbodies in the Project Area

A total of 6 streams were delineated, comprising 10,103.9 linear feet within the Project Area (Table 3 in Appendix A). Five of these streams were determined to be relatively permanent waters and contain intermittent or perennial flow regime, making them likely jurisdictional under the current federal guidelines (33 CFR Part 328). One of these streams was determined to be a non-relatively permanent water and contain ephemeral flow regime, likely making it non-jurisdictional under the current federal guidelines (33 CFR Part 328). Because non-relatively permanent, ephemeral streams are regulated in Ohio, these streams would likely fall under the jurisdiction of the state (3745-1-02 OAC). All streams were evaluated using either the HHEI or QHEI assessment methods (Appendix D).

Hull considers the greater landscape habitat and land use when evaluating the jurisdictional nature of agricultural and other ditch networks. Wetlands that are located solely within an agricultural or roadside ditch are typically considered non-jurisdictional under the current state and federal guidelines (33 CFR Part 328 and 3745-1-02 OAC). Ditches containing wetlands, that bisect larger wetlands or contain wetlands adjacent to the ditch boundaries, may be considered jurisdictional connections between surface water features subject to federal or state regulation.

5.0 REPORT LIMITATIONS

The conclusions presented herein are based on the level of effort and investigative techniques defined under the Scope of Work between Hull and the Client. Hull has conducted this investigation in a manner consistent with published guidance, sound ecological practices, and best professional judgment. No other warranty or guarantee, expressed or implied, is made. This report does not attempt to evaluate past or present compliance with Federal, State and Local environmental or land use laws and regulations. Furthermore, Hull makes no guarantees regarding the completeness or accuracy of any information obtained in review of public or private files or previous investigations at the Project Area not conducted by Hull & Associates, LLC The results of the surface water delineation and the surface water evaluation are subject to verification by the USACE and Ohio EPA, respectively.

Prepared by:

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Ecologist II

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Ecology and Wetlands Practice Leader

Date: 1/14/2021

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Summary: Application Exhibit P - Ecological Assessment Part 1 of 2 electronically filed by Teresa Orahood on behalf of Dylan F. Borchers