



Ohio Department of Natural Resources

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Re: 20-820; Birch Solar Project Environmental Review Request

Project: The proposed project involves the construction of a 300-megawatt (MW) utility-scale photovoltaic solar energy project on approximately 2,176 acres of private land.

Location: The proposed project is located in Allen and Auglaize Counties, 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 the following record at or within a one-mile radius of the project area:

Greater redhorse (*Moxostoma valenciennesi*), State threatened

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. This information is provided to inform you of features present within your project area and vicinity.

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

The project is within the vicinity of records for the little brown bat (*Myotis lucifugus*), a state endangered species. Because presence of state endangered bat species has been established in the area, summer tree cutting is not recommended, and additional summer surveys would not constitute presence/absence in the area. However, limited summer tree cutting inside this buffer may be acceptable after further consultation with DOW (contact Sarah Stankavich, sarah.stankavich@dnr.state.oh.us).

In addition, 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 bat species 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. The DOW recommends tree 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.

The DOW also recommends that a desktop habitat assessment, followed by a field assessment if needed, is conducted to determine if there are potential hibernaculum(a) present within the project area. Information about how to conduct habitat assessments can be found in the current USFWS “Range-wide Indiana Bat Survey Guidelines.” If a habitat assessment finds that potential hibernacula are present within 0.25 miles of the project area, please send this information to Sarah Stankavich, sarah.stankavich@dnr.state.oh.us for project recommendations. If a potential or known 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 clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the northern riffleshell (*Epioblasma torulosa rangiana*), a state endangered and federally endangered mussel, and the pondhorn (*Unio merus tetralasmus*), 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 of the pirate perch (*Aphredoderus sayanus*), a state endangered fish, and the greater redhorse (*Moxostoma valenciennesi*), 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 these or other aquatic species.

The project is within the range of the lark sparrow (*Chondestes grammacus*), a state endangered bird. This sparrow nests in grassland habitats with scattered shrub layers, disturbed open areas, as well as patches of bare soil. These summer residents normally migrate out of Ohio shortly after their young fledge or leave the nest. If this type of habitat will be impacted, construction should be avoided in this habitat during the species’ nesting period of May 1 to June 30. If this habitat will not be impacted, the 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 Amanda and Shawnee townships, Allen County; and Logan and Duchouquet townships, Auglaize County. This area is in the Central Ohio Clayey Till Plain physiographic region. This region is characterized by well-defined end moraines as well as flat-lying ground moraines. Intermorainal lake basins filled with silt, clay and till are present. There are few large streams and limited sand and gravel outwash. A high-lime Wisconsinan-age till covers Lower Paleozoic-age carbonate rocks and shales (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-aged glacial features. End moraine, lake-planed moraine and ground moraine features are all present within the project area. End moraine features make up the northern portion of the project area and consist of clayey till that occurs as hummocky ridges that are higher than the adjacent terrain. Lake-planed moraine features make up most of the project area and consist of very flat terrain which was planed by waves in glacial lakes. Small patches of sand, silt, or clay may be found on the surface in many areas. Flat to gently undulating ground moraine features make up the southern boundary of the project area (Pavey et al, 1999). Glacial drift throughout most of the study area is between 25 and 95 feet thick. Drift is thickest near the northern boundary of the project area and thinnest near alluvial areas (Powers and Swinford, 2004).

Bedrock Geology

The uppermost bedrock unit in the project area is the Salina Undifferentiated. This unit is Silurian-aged and consists of a gray to brown dolomite which contains argillaceous partings, brecciated intervals, algal laminations and anhydrite/gypsum zones. The Salina Undifferentiated covers a small portion of the project area near the northern boundary. Underlying the Salina Undifferentiated is the Silurian-aged Tymochtee Dolomite. This unit is characterized by an olive gray to yellowish brown dolomite. It frequently contains brownish-black to gray shale laminae. This unit makes up most of the project area. Underlying the Tymochtee Dolomite is the Silurian-aged Lockport Dolomite. This unit is characterized by bluish gray to gray dolomite with minor interbedding of limestone, chert and shale. Fossils and planar to irregular bedding are common. This unit does not make up the uppermost bedrock unit anywhere in the project area but is relevant due to the unit's use as a groundwater aquifer in the area. It should be noted that bedrock is not exposed at the surface within the boundaries of the project area due to significant glacial drift (Slucher et al, 2006).

Oil, Gas and Mining

ODNR has record of 271 oil and gas wells within one mile of the proposed project area. Most of these wells are listed as plugged and abandoned or as historical production wells. This site is partially located within the mapped boundary of the Lima Consolidated Oil Field (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 the Buckland Site mine operated by The National Lime and Stone Company. This mine is a quarry and is located approximately 2.9 miles from the site boundary (Ohio Department of Natural Resources, Division of Mineral Resources, *Mines of Ohio*).

Seismic Activity

Several small earthquakes have historically been recorded near the site. 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
August 15, 2006	2.5	3.8 miles	Allen	Shawnee
September 19, 1884	4.8	4.1 miles	Allen	Perry
May 12, 2006	2.8	6.2 miles	Allen	Bath

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 surface karst features near the project area, however the Salina Undifferentiated, Tymochtee Dolomite and Lockport Dolomite are all carbonate units that can develop karst features under the right conditions and may include solution features that are not apparent on the surface. The nearest mapped karst features are approximately 26 miles east of 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, outwash and alluvium. Blount, Pewamo, Westland, Glynwood, Thackery, Sarnac and Gallman are the most common soil series found within the boundaries of the project area. Together, these soils make up over 90% 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 seasonal saturation and poor drainage in some soils. Slope remains relatively flat, with slope seldom exceeding a 12% grade (USDA Web Soil Survey).

Groundwater

Groundwater resources are plentiful throughout the project area. Wells developed in bedrock are likely to yield between 5 and 100 gallons per minute, sometimes yielding up to 500 gallons per minute. Wells developed in the Tymochtee Dolomite typically yield between 5 and 25 gallons per minute but yields of up to 100 gallons per minute can be expected from wells located towards the northern boundary of the project area where the bedrock unit is thicker. Wells developed in the underlying Lockport Dolomite are known to yield over 100 gallons per minute. Yields of over 300 gallons per minute are known to exist in areas of the Lockport Dolomite where solution cavities are present (Kostelnick, 1981; Kostelnick, 1983; Ohio Department of Natural Resources, Division of Water, *Bedrock Aquifer Map*, 2000). Wells developed in glacial material are likely to yield 5 to 25 gallons per minute. Unconsolidated aquifers in the project area include the Lima End Moraine Aquifer in the northern portion of the project area and the Lima Ground Moraine Aquifer in the southern portion of the project area. 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 370 water wells drilled within one mile of the project area. These wells range in depth from 22 to 284 feet deep, with an average depth of 88.5 feet. The most common aquifers listed are limestone and gravel. Other common aquifers include shale, sand and gravel, and sand. Overall, there are 180 wells that are fully developed in unconsolidated glacial material and 190 wells that were drilled to bedrock. A sustainable yield of 3 to 300 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 19.2 gallons per minute. This is based on records from 98 wells within one mile of the project area that contain sustainable yield data (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

- Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Earthquake Epicenters*, online interactive map, <https://gis.ohiodnr.gov/MapView/?config=earthquakes>
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- Schmidt, J. (1991). *Groundwater Resources Map of Greene County*, Ohio Department of Natural Resources, Division of Geological Survey, map.