



August 13, 2021

In replies, refer to
2021-JAC-52116

Michael Kenneally
EDR Historic Preservation
Project Manager, Midwest Region
PO Box 718
Worthington, Ohio 43085

Dear Mr. Kenneally:

RE: Dixon Run Solar Project, Bloomfield Township, Jackson County, Ohio

This is in response to your correspondence, received on July 16, 2021, concerning the proposed Dixon Run Solar Project, Bloomfield Township, Jackson County, Ohio. The comments of the Ohio State Historic Preservation Office (SHPO) are submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended.

A Phase IA Cultural Resources Survey Dixon Run Solar Project, Bloomfield Township, Jackson County, Ohio proposed work plan was submitted for review. According to the report, the project is a proposed solar electric generation plant encompassing 2,082 acres. The project will consist of the construction, operation and decommissioning of PV solar panels mounted on racking, inverters that will convert direct current (DC) electricity to alternating current (AC) electricity, a network of racking-mounted and buried cables to collect the electricity, a collection substation, laydown yards, and perimeter fencing contained within the Project Area. The maximum height of these facilities (excluding the collection substation and associated infrastructure) will be approximately 15 feet.

A check of our records shows that portions of the overall project area have been surveyed, while sections have not been previously surveyed. Six Phase I archaeological surveys and one Phase II investigation (33JA215) were conducting within the overall project area, mostly associated with strip mining projects. Fourteen sites have been documented in the project area, including two rock shelters.

With regard to the archaeological survey, the work plan indicates that the project area will be divided into elevated sensitivity areas, reduced sensitivity areas and those areas they have been previously mined or previously surveyed areas. Elevated sensitivity areas will be surveyed at 100 percent coverage through standard archaeological field methods. Reduced sensitivity areas will be surveyed at 50 percent, and those areas that have been previously mined/previously surveyed will not be resurveyed. The archaeological work plan suggests conducting a Phase I survey, including surface collection of agricultural fields with surface visibility of 50 percent or greater and shovel test excavations in areas with less than 50 percent surface visibility. Previously recorded archaeological sites within the Project Area will be visually inspected to ascertain site conditions. In addition, sloped areas above 12 percent, outside of previous mining activity areas, will be inspected for the presence of potential Native American rock shelters.

All field methods are in accordance with the 1994 *OHPO Archaeological Guidelines*. Should the project or construction limits change or should there be a significant deviation from the submitted work plan and the potential for known historic resources to be affected, we request that a modified work plan be submitted to our



office for review and comment. Given the presence of sites nearby on similar topography and the potential for cultural resources in the project area, SHPO agrees with the archaeological survey work plan.

With regard to the historic architecture work plan, EDR proposes to perform a reconnaissance level survey for all structures 50 years of age or older within the project boundary and in an area extending two (2) miles around the project boundary. Additionally, any property that is listed in the National Register of Historic Places (NRHP) or previously determined eligible for listing in the NRHP will be resurveyed to determine if the property continues to meet NRHP requirements of significance and integrity. The field survey work will be summarized in a report and Ohio Historic Inventory (OHI) forms will be completed for those resources that are recommended as needing additional research or as eligible for listing in the NRHP as a result of the survey. SHPO agrees that the History/Architecture Reconnaissance Survey proposal is a suitable method to evaluate the effect of the Dixon Run Solar Project and inform appropriate mitigation measures if necessary.

If you have any questions, please contact me at (614) 298-2000, or by email at dgagliano@ohiohistory.org. Thank you for your cooperation.

Sincerely,

A handwritten signature in black ink that reads "Dawn Walter Gagliano".

Dawn Walter Gagliano, Project Reviews Manager
Resource Protection and Review

RPR Ser. No. 1089351

Phase IA Cultural Resources Survey

Dixon Run Solar Project

Bloomfield Township, Jackson County, Ohio

Prepared for:



SunEnergy1

192 Raceway Drive

Mooresville, North Carolina 28117

Prepared by:



Environmental Design & Research, D.P.C.

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Worthington, Ohio 43085

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July 2021

MANAGEMENT SUMMARY

Involved Agencies:	Ohio Power Siting Board (OPSB) Ohio Historic Preservation Office (OHPO)
Phase of Survey:	Phase IA Cultural Resources Survey
Location Information:	Bloomfield Township, Jackson County, Ohio
Survey Area:	
Project Description:	A 140-megawatt (MW) utility-scale solar project consisting of ground-mounted photovoltaic (PV) panels and associated infrastructure.
Project Area:	An approximately 2,082-acre area that will host all components of the Project.
Historic Resources Study Area:	The area within two miles of the Project Area.
Area of Potential Effects (APE):	<p>The APE for Direct Effects is the area representing the maximum possible area of soil disturbance associated with the Project.</p> <p>The APE for Indirect (Visual) Effects represents portions of the Historic Resources Study Area where there is potential Project visibility. The APE for Indirect Effects extends into portions of Franklin and Madison townships, Jackson County.</p>
USGS 7.5-Minute Quadrangle Map:	<i>Oak Hill, Ohio; Wellston, Ohio; Mulga, Ohio; and Rio Grande, Ohio</i>
Archaeology Resources Overview:	There are 14 Ohio Archaeology Inventory (OAI) sites and 14 OAI Site Boundaries mapped within the Project Area.
Historic Resources Overview:	The Historic Resources Study Area includes six properties listed on the Ohio Historic Inventory (OHI), including one resource listed on the National Register of Historic Places (NRHP), 18 cemeteries designated by the Ohio Genealogical Society (OGS), and no Ohio Department of Transportation (ODOT) historic bridges nor National Historic Landmarks (NHLs).
Report Authors:	Michael Kenneally, Nicole Fragnito
Date of Report:	July 2021

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Photo 2. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing Northwest

Photo 3. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing Northeast.

Photo 4. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing East

1.0 INTRODUCTION

1.1 Purpose and Goals of the Investigation

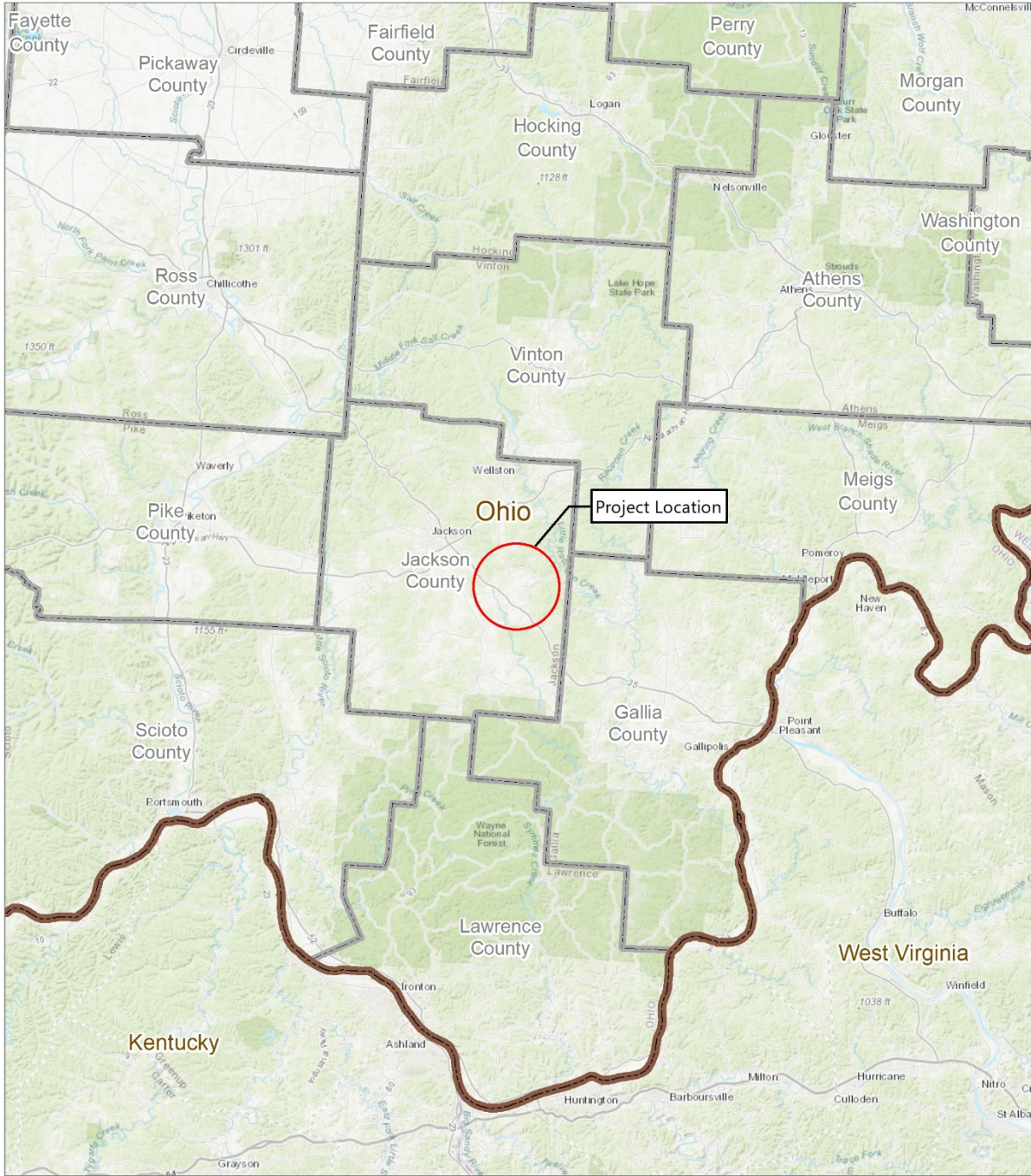
SunEnergy1 (the Applicant) is proposing to construct the Dixon Run Solar Project, an up to 140-megawatt (MW) photovoltaic (PV) solar project to be located in Bloomfield Township, Jackson County (the Project) (Figure 1). The information and recommendations included in this report are intended to assist the Ohio State Historic Preservation Office (SHPO) with its review of the Project for the Ohio Power Siting Board (OPSB). Specifically, the Phase IA Cultural Resources Survey has been prepared to satisfy the below portions of Section 4906-04-08(D) of the Ohio Administrative Code:

The applicant shall provide information on cultural and archaeological resources.

(1) Landmark mapping. The applicant shall indicate, on a map of at least 1:24,000 scale, any formally adopted land and water recreation areas, recreation trails, scenic rivers, scenic routes or byways, and registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance within ten miles of the project area. Landmarks to be considered for purposes of paragraph (D) of this rule are those districts, sites, buildings, structures, and objects that are recognized by, registered with, or identified as eligible for registration by the national registry of natural landmarks, the state historical preservation office, or the Ohio department of natural resources.

(2) Impacts on landmarks. The applicant shall provide an evaluation of the impact of the proposed facility on the preservation and continued meaningfulness of these landmarks and describe plans to avoid or mitigate any adverse impact.

This report includes a records review of maps and documents that are “registered landmarks of historic, religious, archeological...or other cultural significance,” i.e., those “districts, sites, buildings, structures, and objects that are recognized by, registered with, or identified as eligible for registration by...the state historical preservation office” located within the Project Area and surrounding two-mile radius (Historic Resources Study Area) that could potentially be affected by the construction and/or operation of the Project. Please note that the requirements of Section 4906-04-08(D)(1) and (2) addressing “formally adopted land and water recreation areas, recreation trails, scenic rivers, scenic routes or byways” and “registered landmarks of...scenic [and] natural...significance” are not addressed in this report. The Phase IA Cultural Resources Survey has been prepared by professionals who meet the Secretary of the Interior’s Standards for Professional Qualifications (per 36 CFR, Part 61) in their respective fields.



Basemap: Esri ArcGIS Online "World Topographic Map" map service.

Figure 1. Regional Project Location

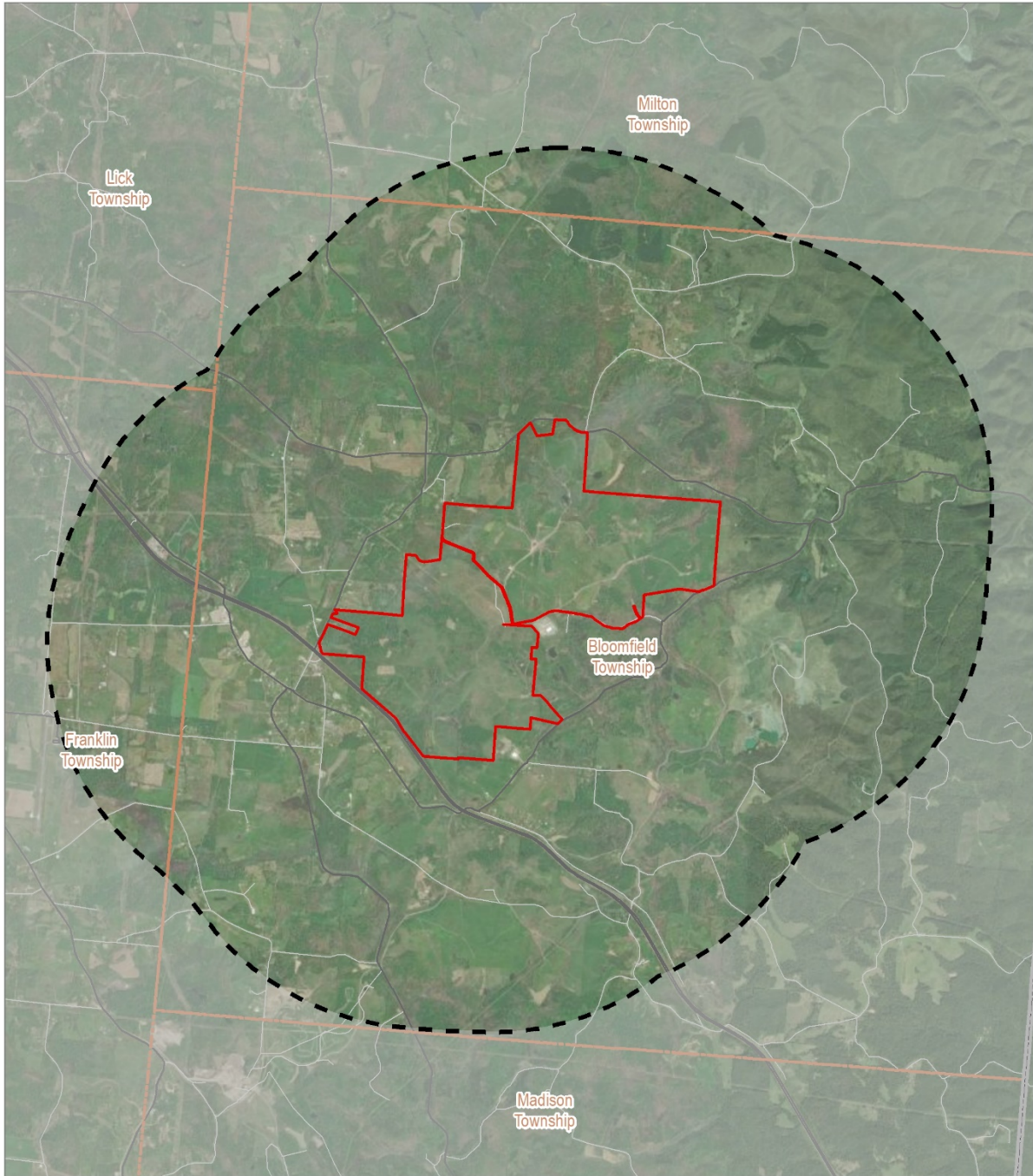
1.2 Project Location and Description

The Project is a proposed solar electric generation plant to be located in Bloomfield Township, Jackson County, Ohio (See Figure 1). The Project will consist of the construction, operation and decommissioning of PV solar panels mounted on racking, inverters that will convert direct current (DC) electricity to alternating current (AC) electricity, a network of racking-mounted and buried cables to collect the electricity, a collection substation, laydown yards, and perimeter fencing contained within the Project Area. The maximum height of these facilities (excluding the collection substation and associated infrastructure) will be approximately 15 feet. The Project Area encompasses all Project-related development and components within approximately 2,082 acres of private land (Figure 2).

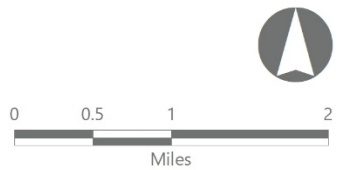
It is anticipated that following construction, each section of the Project will be surrounded by fencing and selected sections may include landscape buffering/vegetative screening outside the fence.

The following terms are used throughout this document to describe the proposed action:

<u>Project:</u>	Collectively refers to all components of the Project and associated infrastructure (such as solar panels, collection lines, substation, and other equipment) in Bloomfield Township, Jackson County, Ohio.
<u>Project Area:</u>	An approximately 2,082-acre area of leased parcels that will host all components of the Project.
<u>Historic Resources Study Area:</u>	The area within two miles of the Project Area which accounts for potential visual effects on historical resources. The Historic Resources Study Area also includes portions of Franklin and Madison townships, Jackson County, Ohio
<u>APE for Direct Effects:</u>	The Area of Potential Effects (APE) for Direct Effects is the buildable area within the Project Area that represents the maximum area of potential soil disturbance associated with the Project. Site layout is preliminary and subject to change.
<u>APE for Indirect Effects:</u>	The APE for Indirect (Visual) Effects on historic resources represents portions of the Historic Resources Study Area where there is potential Project visibility within a 2-mile radius of the Project.



- Project Area
- Historic Resources Study Area
- Township Boundary



Basemap: Ohio Statewide Imagery Program Service 2012.

Figure 2. Project Area and Historic Resources Study Area

The Project Area is located in a rural setting with gently rolling hills and consists of land that was previously utilized as a surface coal mine that has been reclaimed. The Project Area has undergone significant previous ground disturbance due to previous surface coal mining and reclamation activities and now consists of mostly of pastureland with shrub, grasses, and wooded areas growing over reclaimed areas of the previous surface coal mine disturbance.

Most of the landscape within the 2-mile Historic Resources Study Area is that of rolling hills with large, wooded areas, open agricultural fields, and both active and reclaimed surface mining areas. US Route 35 runs in a northwest/southeast direction just to the south of the Project Area and State Route 327 runs in a northeast/southwest direction just to the west of the Project Area. Other local and township roads wind throughout the rural setting of the Historic Resource Study Area. Existing developed features in the Project Area include electric transmission lines, reclaimed surface mines, public roads, and modern agricultural buildings. There are no concentrated population centers located within the Historic Resources Study Area, but small communities, consisting of concentrations of single-family homes are present to the south and northeast of the Project Area, adjacent to US Route 35 and State Route 327, respectively.

1.3 Project Components

Relative to conventional energy generation methods of a similar scale, solar facilities result in minimal impacts to the environment. Impacts from the construction and operation of solar generation are largely the result of the fact that utility-scale solar energy facilities require large, contiguous areas for the collection and distribution of energy. The Applicant is committed to minimizing impacts to cultural and natural resources. The Project is sited in a rural region on land previously used for coal surface mining, in part to minimize the need for land clearing and typical construction processes such as surface grading and soil compaction.

The Project will feature minimally intrusive solar panels and mounting systems to minimize soil disturbance so that the land can return to its current state following the decommissioning of the Project (Figure 3). The solar panel racking will consist of piles that will be driven, or screws that will be rotated, into the ground in long rows. Only some minimal grading may be required in certain locations, although in most cases, the



Basemap: Esri ArcGIS Online "World Imagery" map service.

Figure 3. Preliminary Project Components

rows will follow the natural topography. Following construction, any disturbed areas will be restored with topsoil, and a cover of native grass species will be established underneath and around the solar panels. This section includes a description of the components currently being proposed for the Project. The final layout and design of the proposed Project has not been fully established and may be subject to change.

1.3.1 Solar Panels and Racking

The Project will generate electricity with conventional solar panels, which will be affixed to metal racking. The racking will include piles that will be driven, or screws that will be rotated, into the ground in long rows. The rows generally will follow the existing topography of the Project Area, although some rough grading may occur. Rows will be grouped in large clusters, referred to as solar fields, each of which will be separately fenced. Solar panels will typically be installed on south facing slopes and are not expected to exceed 15 feet in height above grade.

1.3.2 Inverters and Collection Lines

Within each solar field, a network of electric lines and associated communication lines, commonly referred to as collection lines, will collect the electric power from different groups of rows and transmit it to a central location. Solar panels will be grouped into series of circuits that are routed, through cable trays on the racking, to combiner boxes. Power from one or more of the combiner boxes will then be transmitted to a DC-to-AC inverter. The equipment comprising each inverter will be mounted on a prefabricated foundation such as a metal skid, gravel pad or concrete block. Each Inverter will deliver AC power to a fenced, substation dedicated to the Project (Project Substation). The Inverters will be connected to the Project Substation through a second network of collection lines, some of which will be outside the fences. All portions of the collection lines outside of the fences will be buried at least 36 inches below grade.

1.3.3 Project Substation

The Project Substation will be located adjacent to an existing 138 kV transmission line. The equipment for the Project Substation will be constructed on a concrete foundation and will be of a size and configuration similar to numerous existing substations in the region. A fence will be installed around the perimeter.

The various components comprising the Project Substation are expected to vary in height, but generally will be up to 15 feet. With the exception of lightning masts, the tallest piece of equipment likely will be the dead-end structure, which is expected to be in the range of 20-25 feet. Lightning masts may be 35 to 45 feet in height but will be very narrow and difficult to discern from a distance.

1.3.4 Roads

The Project will include a number of unpaved roads comprised of aggregate material and/or grass used for accessing each solar field and equipment within them. Short driveways will connect the roads to public roads at one or more points for each solar field. Roads will be used for the operations and maintenance of equipment in addition to providing sufficient access for emergency response. Existing roads will be utilized where available and will only be as long and wide as necessary to accommodate construction and operational activities.

1.3.5 Laydown Yards

Laydown yards will be used for the temporary storage and staging of components and construction equipment, as well as used to provide parking for construction workers. Laydown yards will be constructed by adding aggregate to the existing ground surface with minimal, if any, modification. The laydown yards will be restored upon completion of construction activities but may be used again during decommissioning.

1.3.6 Pyranometers

The Project will include a number of pyranometers, which will consist of various meteorological instruments and associated communications equipment. The pyranometers will be installed on a pre-cast concrete block foundation, gravel pad or directly on the ground, and will be less than 15-feet in height.

2.0 PROJECT BACKGROUND

2.1 Background Research Methods

Background research for the proposed Project was further refined and conducted within the Historic Resources Study Area using methods described below. Archives and repositories consulted during EDR's research for the Project included the OHPO online Geographic Information Systems (GIS) mapping system (Ohio History Connection, 2021), the David Rumsey map collection (Rumsey, 2021), topoView (USGS, 2021) and EDR's in-house collection of historic and archaeological reference materials.

Previously recorded resources within the Historic Resources Study Area identified on the OHPO GIS mapping system and other databases are described below and depicted on Figure 4. These include:

- National Register of Historic Places (NRHP)
- NRHP Determination of Eligibility (DOE)
- Ohio Historic Inventory (OHI)
- Ohio Department of Transportation (ODOT) Historic Bridge Inventory
- Ohio Archaeological Inventory (OAI)
- Ohio Genealogical Society (OGS) cemetery files
- Previous cultural resources surveys
- 1914 Mills *Archaeological Atlas of Ohio*
- National Historic Landmarks (NHL)

2.1.1 National Register of Historic Places (NRHP)

The review of the OHPO online GIS mapping system indicates that there is one NRHP-listed resource, the Keystone Furnace, located within the 2-mile Historic Resources Study Area.

2.1.2 NRHP Determination of Eligibility (DOE)

The review of the OHPO online GIS mapping system indicates there no resources formally determined eligible for listing on the NRHP within the Project Area or the 2-mile Historic Resources Study Area.

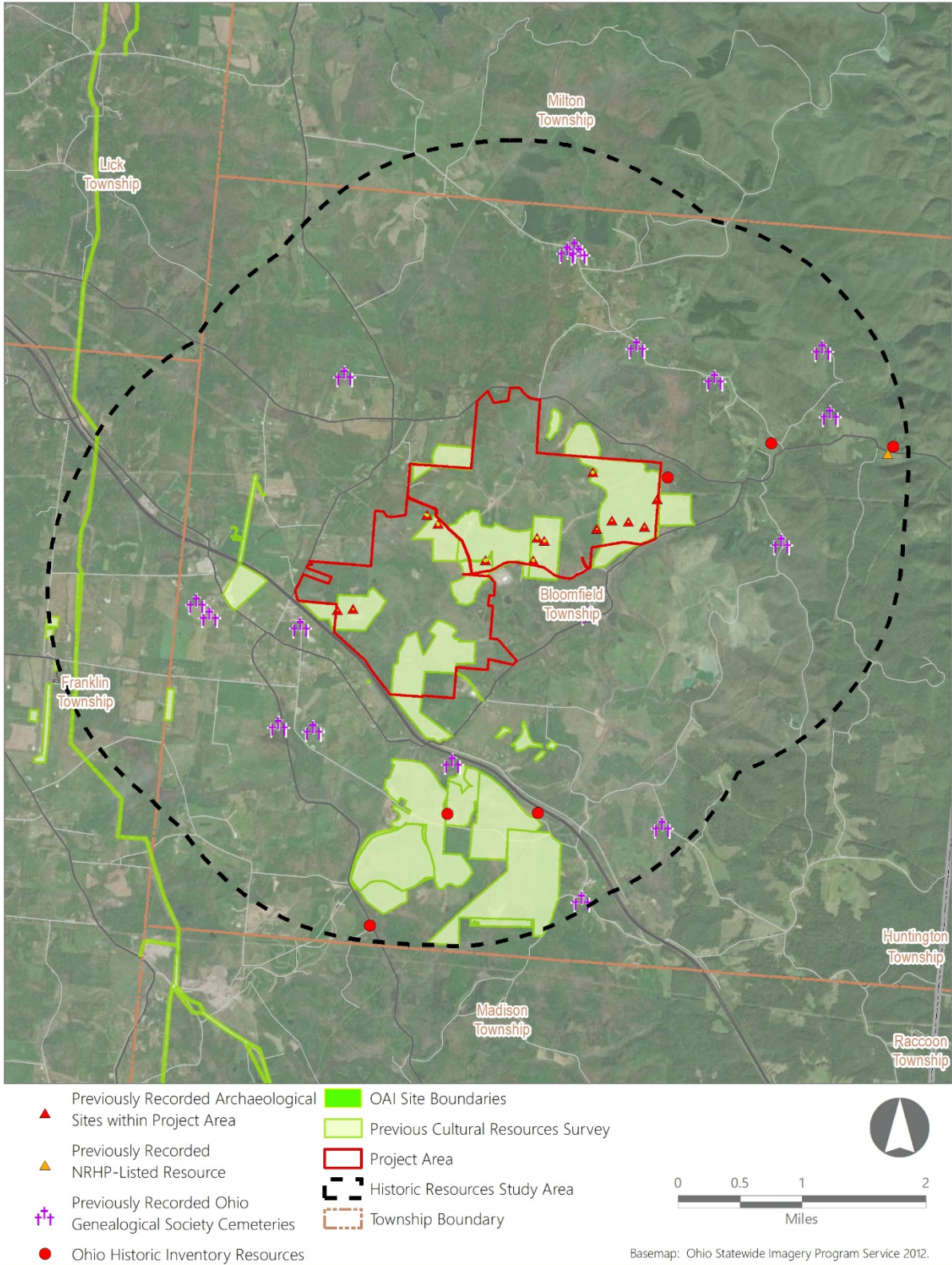


Figure 4. Previously Identified Cultural Resources and Surveys

2.1.3 Ohio Historic Inventory (OHI)

The review of the OHPO online GIS mapping system indicates there are no OHI designated resources located within the Project Area and six OHI-designated properties mapped within the 2-mile Historic Resources Study Area, including one resource, the Keystone Furnace, listed in the NRHP (see Table 1 and Figure 4).

Table 1. Ohio Historic Inventory (OHI) Resources within 2 Miles of the Project Area

OHI ID	Name / Location	Township	Distance from Project
JAC0001809	Keystone Furnace/ CR 9200 ft E of Little Racoon	Bloomfield	1.8 miles
JAC0005409	Limestone Furnace / C H & D Road, S Central ¼ Sect 32	Madison	0.1 mile
JAC0016309	Daniel Patterson House / TR 150	Bloomfield	0.9 mile
JAC0016809	Bloomfield Tipple / 150 ft W of CR 10 near TR 725	Bloomfield	0.9 mile
JAC0020209	Oglesbee 1 / Keystone Furnace Road	Bloomfield	0.07 mile
JAC0020409	Morgan House / end of TR 960 Morgan Road	Bloomfield	1.2 miles

*Bold text denotes NRHP-listed resource

2.1.4 Ohio Department of Transportation (ODOT) Historic Bridge Inventory

No historic bridges listed on the ODOT Historic Bridge Inventory are located within the Project Area nor the Historic Resources Study Area (ODOT, 2021).

2.1.5 Ohio Archaeological Inventory (OAI)

The records review of the OHPO online GIS mapping identified 68 previously recorded archaeological sites within 2-miles of the Project Area. Of the 68 archaeological sites, 14 are located within the Project Area, described in Table 2 (see Figure 4).

Table 2. Ohio Archaeological Inventory Sites within the Project Area

OAI ID	Site Name	Affiliation	Period	Site Type
JA0113	Gilmore Site	Native American	Unknown	Unknown
JA0114	Finch Site I	Native American	Unknown	Unknown
JA0115	Finch Site II	Native American	Unknown	Unknown
JA0143		Historic	20 th century	Architectural
JA0144		Historic	19 th & 20 th centuries	Refuse disposal
JA0145		Historic	19 th & 20 th centuries	Refuse disposal

OAI ID	Site Name	Affiliation	Period	Site Type
JA0146		Native American	Unknown	Unknown
JA0174	Waterloo Historic Complex	Historic	1930-1949	Industrial
JA0243		Native American	Unknown	Unknown
JA0244		Native American	Unknown	Unknown
JA0245		Native American	Unknown	Unknown
JA0246	Dickason Run Rockshelter	Native American	Unknown	Unknown
JA0247		Native American	Unknown	Unknown
JA0248		Native American	Unknown	Unknown

2.1.6 Ohio Genealogical Society (OGS) Cemeteries

18 OGS cemeteries have been recorded within the Historic Resources Study Area (Table 3 and see Figure 4). None of these cemeteries are located within the Project Area.

Table 3. Ohio Genealogical Society (OGS) Cemeteries within 2 Miles of the Project Area

OGS ID	Cemetery Name	Distance from Project
5868	Bethania-(Bethana)	1.8 miles
5872	Dixon Run	0.3 mile
5873	Frasure-(Fraser)	0.7 mile
5874	Keystone	1.4 miles
5875	Marcum	0.5 mile
5876	Pattonsville-Pattonsville Community	1.2 miles
5877	Perkins	1.6 miles
5879	Scurlock	1.2 miles
5880	Union	0.9 mile
5882	Vega	1.9 miles
5883	Winchester	0.2 mile
13631	Andrews	0.8 mile
13632	Campbell-Hurt	1.0 mile
13636	McClure	0.7 mile
13637	Pennington	0.9 mile
13638	Price	1.2 miles
13639	Six Brothers	0.8 mile
13641	Ward	0.9 mile

2.1.7 Previous Cultural Resources Surveys

Within the 2-mile Historic Resources Survey Study Area, 30 previous cultural resources surveys have been conducted, including one Phase II investigation (see Table 4). Of these surveys, six have been conducted within the Project Area (bold entries below). All of the surveys conducted within the Project Area were Phase I surveys and were conducted for the previous surface coal mining activities that have occurred within the Project Area.

Table 4. Previous Cultural Resources Surveys within 2 Miles of the Project Area

National Archeological Database (NADB) ID	Title	Author	Year
12241	A Phase I (Lit. Review) Archaeological Survey of a Proposed Strip Mine Area in Bloomfield Township, Jackson County, Ohio, Application Permit No. 0746	Murphy, James L.	1986
12242	A Cultural Resource Investigation of the Proposed Surface Mining Permit Application in Bloomfield Township, Jackson County, Ohio	Bush, David R., et al.	1986
12245	A Cultural Resource Investigation of the Proposed Permit Application No. D-0205-8, Bloomfield Township, Jackson County, Ohio	Bush, David R., et al.	1988
12250	A Cultural Resource Investigation of Proposed Permit Application D-0594-3 in Bloomfield Township, Jackson County, Ohio	Bush, David R. et al.	1989
12251	A Cultural Resource Investigation of Proposed Permit Application 205-10 in Bloomfield Township, Jackson County, Ohio	Bush, David R. et al.	1989
12256	Phase I and II Cultural Resource Survey of a 100 Acre Proposed Surface Coal Mine Area (Permit Application #1162), Jackson County, Ohio	Doershuk, John F.	1990
12258	Phase I and II Cultural Resource Survey of a 40 Acre Proposed Surface Coal Mine Area (Permit Application #D-205-11), Jackson County, Ohio	Doershuk, John F.	1990
12259	Phase I and II Cultural Resource Survey of a 135 Acre Proposed Surface Coal Mine Area (Permit Application #D-0594-5), Jackson County, Ohio	Doershuk, John F.	1990
12274	Phase I Cultural Resource Survey of 250 Acres of Proposed Surface Coal Mine Area (Permit Applications #D-0594-7 and #D-0594-8), Jackson County, Ohio	Duerksen, Ken and John F. Doershuk	1995
12275	Phase I Cultural Resource Survey of a 38.9 Acre Proposed Surface Coal Mine Area (Permit Application #D-0968-1), Jackson County, Ohio	Duerksen, Ken and John F. Doershuk	1995
12278	A Phase II Archaeological Study of 33 JA 215, A Ridgetop Lithic Scatter in Bloomfield Township, Jackson County, Ohio: ODNR Application Permit No. D-0968-1	Murphy, James L.	1995
12279	A Phase II Archaeological Assessment of "Rockshelter 1" in Section 33, Bloomfield Township, Jackson County, Ohio: ODNR Application Permit #D-0594-7	Murphy, James L.	1995

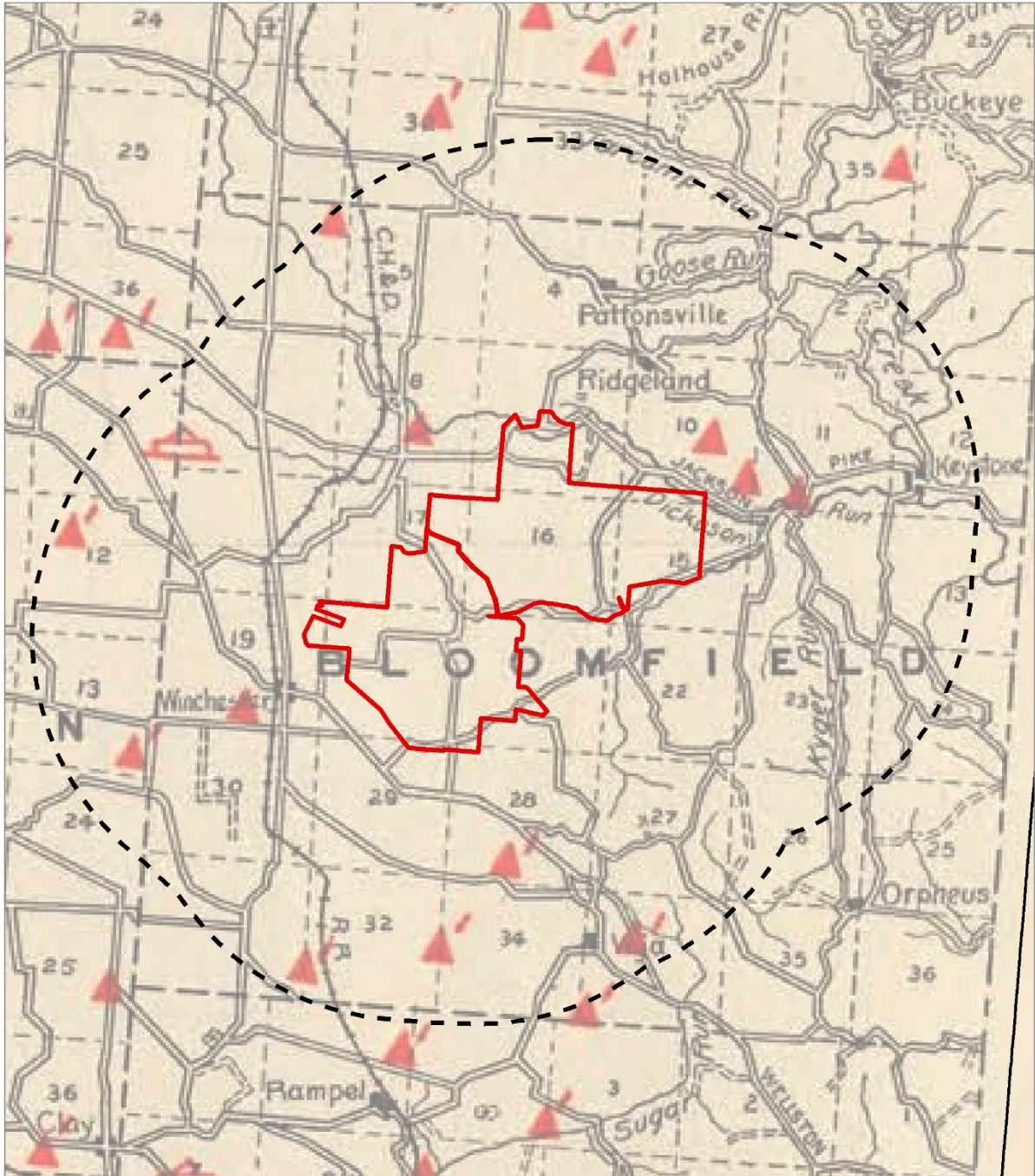
National Archeological Database (NADB) ID	Title	Author	Year
12280	A Phase II Archaeological Assessment of 33-JA-216, A Late 19th-Early 20th Century Farmstead in Section 33, Bloomfield Township, Jackson County, Ohio: ODNR Application Permit #D-0594-7	Murphy, James L.	1995
13380	A Phase I Archaeological Literature Review and Field Reconnaissance of a Portion of Ohio Department of Natural Resources Permit Application Area #D 0594-7, Section 33, Bloomfield Township, Jackson County, Ohio	Murphy, James L.	1996
13609	A Phase I Literature Survey and Archaeological Field Reconnaissance of a Proposed Coal Mining Area in Bloomfield Township, Jackson County, Ohio	Murphy, James L.	1997
13981	A Phase I Literature Survey and Archaeological Field Reconnaissance of a Proposed Coal Mining Area in Bloomfield Township, Jackson County, Ohio. Application Permit No. 1440.	Murphy, James L.	1998
14474	Phase I Cultural Resources Survey for the Westlake Application (Permit #10056) in Bloomfield Township, Jackson County, Ohio	Haywood, Norman A.	2000
14568	Phase I Cultural Resources Management Investigations for a Proposed 16 ha (40 a.) Bloomfield Power Generating Facility Site in Bloomfield Township, Jackson County, Ohio	Weller Von Molsdorff, Ryan J. and Scott M. Derick	2000
14569	Phase I Cultural Resources Management Investigations for a Proposed 1.2 km (.75 mi) Utility Corridor in Bloomfield Township, Jackson County, Ohio	Weller Von Molsdorff, Ryan J. and Scott M. Derick	2000
14570	Addendum Report: Archaeological Investigations for Two Access Corridors for the Proposed 1.2 km (.75 mi.) Utility Corridor in Bloomfield Township, Jackson County, Ohio	Weller Von Molsdorff, Ryan J	2001
14571	Addendum Report II: Archaeological Investigations for Two Access Corridors for the Proposed 1.2 km (.75 mi.) Utility Corridor in Bloomfield Township, Jackson County, Ohio	Weller Von Molsdorff, Ryan J	2001
15072	Phase I Archaeological Investigations for approximately 15.3 ha (37.8 a.) of Expansions and Improvements to the Jackson County Regional Airport in Franklin Township, Jackson county, Ohio	Weller, Ryan J. and Matthew Haines	2002

National Archeological Database (NADB) ID	Title	Author	Year
15227	Phase I Cultural Resources Survey of Ohio River Pipe Line LLC's Proposed Kenova, West Virginia to Columbus, Ohio Petroleum Pipeline Project in Lawrence, Gallia, Jackson, Vinton, Hocking, Pickaway, Fairfield, and Franklin Counties, Ohio. Volume I.	Duerksen, Ken, et al.	2000
16608	Investigation for Proposed Cell Tower Location at 1659 Dixon Run Road, Bloomfield Township, Jackson County, Ohio (CTL#05510039COLa)	Brown, Joel	2005
18638	Addendum to : A Cultural Resource Investigation of the Proposed Permit Application No. D-594-1 in Bloomfield Township, Jackson County, Ohio	Bush, David R. and Mark A. Kolleyer	1989
18639	Addendum II: A Cultural Resource Investigation for the Proposed Surface Mining Permit Application No. D-594-1 in Bloomfield Township, Jackson County, Ohio	Bush, David R. and Mark A. Kolleyer	1989
18847	Phase II Archaeological Survey of the Proposed Mining Tract Permit 746 in Bloomfield Township, Jackson County, Ohio	Kime, Julie	1986
19402	Phase I Archaeological Resource Management Investigation for a .25 ha (.63 ac) Proposed Expansion Area at the Jackson County Regional Airport in Franklin Township, Jackson County, Ohio	Weller, Ryan	2014
20108	Phase I Archaeological Investigation for Columbia Gas Transmission, LLC's Proposed Line R501 Seamless Project in Fayette, Perry, Lawrence, & Aid Townships, Lawrence Co., Greenfield Township, Gallia Co.; & Madison & Franklin Townships Jackson Co., Ohio	Mabelitini, Brian	2016
20270	Addendum to: Phase I Archaeological Investigation for Columbia Gas Transmission Proposed Line R501 Seamless Project Fayette, Perry, Lawrence, & Aid Townships, Lawrence; Greenfield Township, Gallia; Madison & Franklin Townships, Jackson Counties., Ohio	Mabelitini, Brian	2016

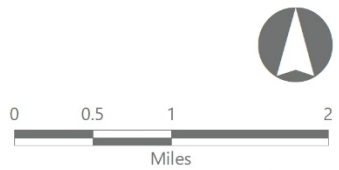
*Bold entries denote surveys conducted within Project Area.

2.1.8 Mills Archaeological Atlas of Ohio (1914)

There are no sites recorded in Mills' *Archaeological Atlas of Ohio* located within the Project Area. However, 14 sites are located within the Historic Resource Study Area (see Figure 5; Mills 1914:88). These mapped



 Project Area
 Historic Resources Study Area



Basemap: 1914 Mills Archaeological Atlas of Ohio

This historic map has been georeferenced and is not intended to depict survey-accurate information.

Figure 5. 1914 Mills Archaeological Atlas of Ohio

sites consist of 13 burial mounds and one village site. Information from the Mills atlas is discussed in greater detail in Section 2.3, below.

2.1.9 National Historic Landmarks (NHL)

No designated NHLs are located within the Project Area or the Historic Resources Study Area (NPS, 2021).

2.2 Native American Cultural Context

The *Archaeological Atlas of Ohio* (Mills, 1914) and information retrieved from the OHPO online database indicate that numerous Native American earthworks (e.g.: burial mounds and enclosures) and interments are found in southeastern Ohio. Earthwork sites are often clustered together in large numbers and usually located in close proximity to streams. Mills (1914) notes that Jackson County was the location of salt licks originating from the springs and headwaters of Salt Creek in the southern portion of the present-day county boundaries. This natural resource led to the area being a hub of activity, with people travelling into and out of the region, and may account for the large number of rock shelter sites, as well as the seemingly temporary nature of many of the identified sites. However, the county also contained sedentary populations as witnessed by the numerous village sites located throughout the county.

Mills also notes that Jackson County has 173 mound earthworks, six enclosure earthworks, 22 village sites, one petroglyph, one flint quarry, and 30 identified rock shelters. As noted above, there are no sites from the Mills atlas in the Project Area. However, there are 14 mapped sites, including 13 burial mounds and one village site within the Historic Resources Study Area (Mills, 1914; see Figure 5).

In his analysis of Late Paleoindian and Early Archaic settlement in Ohio, Chidester (2011) discusses an apparent boom in settlement in northwestern and north-central Ohio as the regional climate became warmer and drier during the Early Holocene. Settlement in Ohio during this period (approximately 11,500 to 7,750 years ago) clustered along the northern shore of Lake Erie and the lake plains of northwestern and north-central Ohio (Chidester, 2011; Stothers, 1996). To the south, Paleoindian sites are also found along the terraces of the Ohio River and adjacent saline springs, which proved attractive to Paleoindian peoples and game alike (Cunningham, 1973). Seeman and Prufer (1982) also note the presence of higher density Paleoindian artifacts along major rivers in central and southern Ohio, particularly the Ohio, Miami, Scioto,

and upper Muskingum valleys. Sites along these major river valleys, which are theorized to have provided easily traversed routes for large game animals, are concentrated on elevated landforms such as terraces (Cunningham, 1973; Seeman and Prufer, 1982). More specifically, Paleoindian sites along river valleys tend to concentrate near confluences (Seeman and Prufer, 1982). In his overview of Ohio Archaic sites, Purtill (2009) notes that Late Archaic semi-annual to year-round settlements are located along major rivers, including the Ohio, particularly on terraces and near confluences with other streams.

In Late Archaic and Early Woodland settlement patterns in the western Lake Erie region, Stothers and Abel (1993) note that in the lower Maumee River and its tributaries clusters of sites are known at virtually every major rapid. This pattern reflects seasonal congregations to fish at these locations. They further note that large settlement sites in this area (which typically contain cemeteries) are always located close to the river, whereas smaller “nuclear family hunting and collecting camps” are located both along rivers and in upland settings (Stothers and Abel, 1993).

In his analysis of Late Woodland settlement in the Hocking River Valley of southeastern Ohio, Wakeman (2003) argued that foraging Late Woodland populations appeared to place higher value on areas suitable for resource extraction; whereas, Late Prehistoric farmers appeared to place higher value on extensive flat areas with well-drained soils suitable for growing crops. This is reflected in the archaeological record with Late Woodland sites evenly spread across the landscape on a variety of different landforms and with major Late Prehistoric sites concentrated along the bottoms of major river valleys.

For settlement patterns in an eight-county study area in central Ohio, Nolan (2014) found a preference for well-drained soils. He also found that streams proved to be a better predictor of archaeological site location than wetlands (i.e., sites were more consistently located in close proximity to streams than wetlands) across all time periods (Nolan, 2014).

In the mid-eighteenth-century, Virginia, New York, Massachusetts, and Connecticut each laid claim to sections of the Northwest Territory based on seventeenth- and early-eighteenth century charters. These lands encompassed parts of present-day Ohio, Illinois, Indiana, Michigan, Minnesota, and Wisconsin; however, land companies’ and speculators’ efforts to survey and sell these lands were hindered by the French and Indian War (1754-1763), Pontiac’s War (1763-1766), and the American Revolutionary War (1775-

1783). By 1786, the aforementioned states ceded the Northwest Territory to the burgeoning United States federal government. This territory was augmented by Native American land cessions, most notably in the treaties of Fort Stanwix (1784), Fort McIntosh (1785), Fort Finney (1786), Fort Harmer (1789), and Greenville (1795). The Treaty of Greenville established the boundary between the United States and “Indian territory,” which would later become Ohio, Indiana, and Michigan (Inter-State Publishing Company, 1884; Howe, 1907; Willard et al., 1916).

2.3 Historic Context for the Historic Resources Study Area

Sources reviewed for the development of the historic context include the following:

- *Twelfth Annual Report of the Ohio State Board of Agriculture, with an Abstract of the Proceedings of the County Agricultural Societies, to the General Assembly of Ohio: For the Year 1857* (Ohio State Board of Agriculture [OSBA], 1858),
- *History of Lower Scioto Valley, Ohio, Together with Sketches of Its Cities, Villages and Townships, Educational, Religious, Civil, Military, and Political History, Portraits of Prominent Persons, and Biographies of Representative Citizens* (Inter-state Publishing Company, 1884),
- *History of Jackson County, Ohio, Volume I* (Williams, 1900),
- *Historical Collections of Ohio in Two Volumes, Volume I* (Howe, 1907),
- *Bulletin 102: List of Agricultural Fairs and Exhibitions in the United States* (Holmes, 1913), and
- *Standard History of The Hanging Rock Iron Region of Ohio: An Authentic Narrative of the Past, with an Extended Survey of Industrial and Commercial Development, Volume I* (Willard et al., 1916).

Historic maps reviewed for preparation of the historic context and archaeological sensitivity models include the following:

- 1875 *Atlas of Jackson County, Ohio* (Lake, 1875),
- 1908 *Bidwell, OH* and *Wilkesville, OH*; 1912 *Oak Hill, OH*; and 1913 *Jackson, OH* USGS Topographical Quadrangle Maps (USGS, 1908, 1912, 1913),
- 1914 *Archaeological Atlas of Ohio* (Mills, 1914), and
- 1961 *Mulga, Oak Hill, Rio Grande, and Wellston, OH* USGS topographic quadrangles

In the late-eighteenth century, these newly acquired lands in Ohio were divided and reclassified as Congress lands, US Military lands, Virginia Military District, Western or Connecticut Reserve, Fire lands, Ohio

Company's Purchase, Donation Tract, Symme's Purchase, Refugee Tract, French Grant, Dolerman's Grant, Zanes Grant, Canal lands, Turnpike lands, Maumee Road lands, School lands, College lands, Ministerial lands, Moravian Grants, and Salt Sections. The land that would become Jackson County was initially surveyed in 1787 and again in 1795, which revealed the presence of salt springs (also referred to as salt licks or salt-works in historic sources). In *A Standard History of the Hanging Rock Iron Region of Ohio*, Willard et al. include a possible description of the Scioto Salt-Works (located along Salt Creek), as recounted by Col. James Smith during his captivity with a Native American nation (not specified) in 1755:

We then moved to the Buffalo Lick where we killed several buffaloes, and in their small brass kettles, they made about half a bushel of salt. I suppose this Lick was about thirty or forty miles from the aforesaid town and somewhere between the Muskingum, Scioto, and Ohio. About the Licks were clear open woods, and thin white oak land and at that time there were large roads leading to the Licks like wagon roads (Willard et al., 1916: 360).

Although Native American nations throughout the region frequented the salt springs long before European settlement, the land surrounding these springs became congested with squatters or "salt boilers" shortly after the 1795 county survey. In response to this influx of settlers, Congress established the "Scioto Salt Lick Reserve" tract for the newly formed State of Ohio in 1803. The following year, Ohio began regulating commercial salt production at the Scioto Salt-Works through short-term leases. By 1826, the Scioto Salt-Works were abandoned in favor of more productive salt springs elsewhere in the county, and the land was parceled and sold (Inter-State Publishing Company, 1884; Howe, 1907; Willard et al., 1916).

As the state developed, federal expansion policies and settlers increasingly encroached on the Native American reservations established in the Treaty of Greenville. The Treaty of Fort Meigs (1817) and the Treaty of St. Mary's (1818) resulted in vast cession of Native American lands. While some small reservations remained, nearly all Native American nations were removed from Ohio by the 1840s. Military conflicts, as well as controversies surrounding Native American and settler land titles, continued into the nineteenth century (Inter-State Publishing Company, 1884; Howe, 1907; Willard et al., 1916).

Jackson County was established on January 12, 1816, and formed from portions of Scioto, Gallia, Athens, and Ross Counties. It was named in honor of General Andrew Jackson, a celebrated veteran of the War of 1812 (and later, U.S. President). In 1817, Jackson, the county seat, located approximately 6.5 miles to the

northwest of the Project Area, was surveyed and laid out. The southern portion of the settlement was surveyed in 1819. Between 1840 and 1850, the county was split into fourteen townships and then subsequently consolidated into eleven townships. The county seat grew slowly and in 1840 was a community of only 297 residents. By 1846, it contained a newspaper office, four churches, and a few stores (Ohio History Central, 2021a). It was incorporated as a town in 1847. Settlement and population growth in Jackson County increased steadily, with 3,842 residents in 1820 and 28,408 residents in 1890 (Inter-state Publishing Company, 1884; Williams, 1900; Howe, 1907; Willard et al., 1916; Ohio History Central, 2021b).

Bloomfield Township was surveyed by B.F. Stone in 1801 and formed in March 1816. It was among the earliest townships organized in Jackson County; however, few township records dating before 1841 remain. In 1831, part of Franklin Township was annexed, but this section was later removed in 1836, returning Bloomfield Township to its original boundaries. John McConnell & Co. founded the Keystone Furnace, located near the northeastern boundary of the Historic Resources Study Area, in 1848, which was the second coal furnace in the county. By the late-nineteenth century, Keystone Furnace produced more than twenty-four tons of “pig iron” (crude iron) per day. This rural township exhibited limited population growth, with 721 residents in 1840 and 1,557 residents by 1880 (Inter-state Publishing Company, 1884; Howe, 1907; Willard et al., 1916).

The settlers that made Jackson County their home as early as the 1790s were met with dense forests, limited roads, and abundant mineral resources. In addition to Jackson County, Scioto, Lawrence, and Vinton Counties comprised the Hanging Rock Iron Region, which became the state’s leading producers of coal and iron. Following the decline of the salt springs, commercial iron and coal mining operations opened in Jackson County during the 1830s and 1840s, most notably the Jackson Furnace, Keystone Furnace, and Buckeye Furnace. Railroads quickly became the primary transportation routes, opening the region to distant markets and increasing local economic diversity. The Marietta and Cincinnati, the Ohio Southern, the Toledo, Cincinnati and St. Louis railroads, and other local branches transported the county’s coal, iron ore, fire clay and limestone throughout the region. Jackson County’s coal production rapidly increased from approximately 400,000 tons in 1883 to 1,804,772 tons in 1898. By the early-nineteenth century, many coal mines in Jackson County and throughout Ohio were exhausted. However, extractive industries continued throughout Jackson County, with surface coal mining, and other mining activities continuing into the late-twentieth century.

Throughout the nineteenth century, much of the state was occupied by small farms. Jackson County contained thousands of acres of cultivated fields and pastureland; however, the mineral mining industries continued to dominate the region. While extractive industries were predominant throughout the region, the county farmland was also well-suited to corn, wheat, oats, potatoes, and tobacco. In addition to the primary crops, Jackson County had successful orchards and dairy farms, producing 13,571 bushels of apples and 262,410 pounds of butter in 1887, respectively (Inter-state Publishing Company, 1884; Howe, 1907).

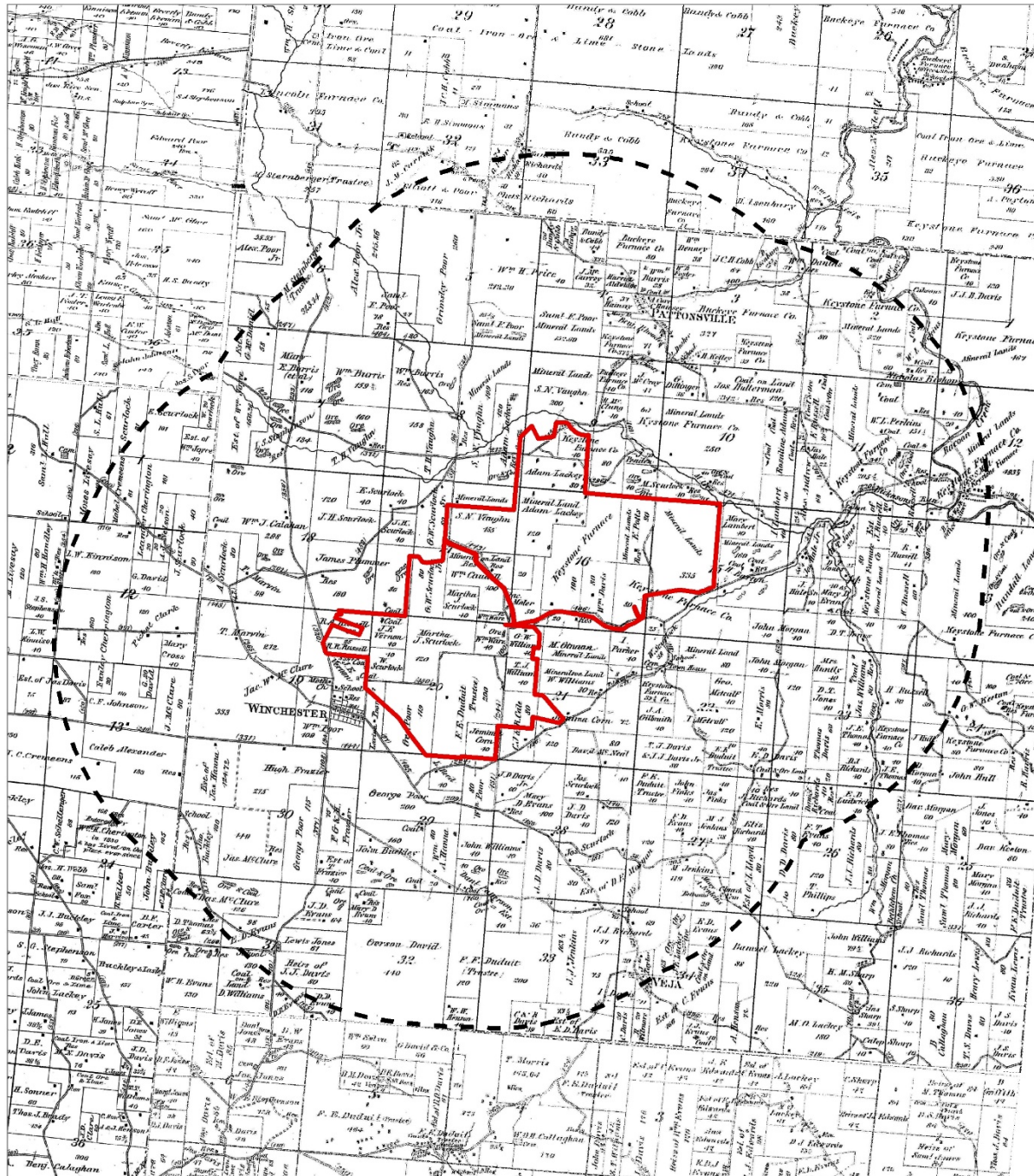
In 1845, the Ohio Board of Agriculture (renamed the Ohio State Board of Agriculture in 1846 and later replaced by the Ohio Department of Agriculture in 1920) was created to support and celebrate Ohio farmers through the establishment of farmers' institutes and county fairs. To achieve this, agricultural boards were created in each county to identify the county's needs and lead the planning process. Concurrently, the Ohio State Board of Agriculture also established the Ohio State Fair in 1849. Due to a cholera epidemic, the fair was postponed until 1850 and held in Cincinnati (Ohio History Central; 2021b, 2021c, 2021d). Agricultural societies and fairs provided opportunities for farmers to share information with each other as well as with the public. The Jackson County Agricultural Society held annual county fairs in the City of Jackson (previously Jackson Township) during October from 1855 until it disbanded in 1880 due to mismanagement and profit losses. The Jackson County Poultry Association held inter-county poultry fairs in Jackson during January into the twentieth century (OSBA, 1858; Inter-state Publishing Company, 1884; Holmes, 1913).

By the late-nineteenth century, farms struggled to remain viable as they faced competition from farms in western states, large local farms, increased mechanization, and the prohibitive cost of machinery. In the early-twentieth century, Governor James M. Cox directed state funds to support agricultural experiments and education for rural regions. Shortly after, Ohio farmers faced the economic impacts of the Great Depression along with severe droughts and crop failures. President Franklin D. Roosevelt instituted Depression-era programs to alleviate the financial strain and soil depletion. Rural areas gradually gained access to electricity, which increased efficiency. By the 1940s, agricultural production rebounded during World War II as farmers supplied food for United States and Allied forces. This period of prosperity immediately following WWII enabled Ohio farmers to invest in modern machinery. The number of farmers in Ohio and size of farms steadily decreased during the latter half of the twentieth century; however, industrial agriculture remains a key economic driver of Ohio's modern economy (Ohio History Central, 2021b, 2021c).

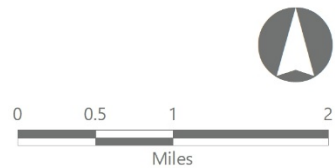
Throughout the twentieth and early-twenty-first centuries, Jackson County retained a predominantly rural character, with approximately seventy-eight residents per square mile and a total population of 32,641 as of 2000. Although the county population has steadily increased since 1990, the City of Jackson remains the largest urban community in Jackson County. While the mining industry declined in the twentieth century, manufacturing businesses are the leading employers in the county. The local economy is also bolstered by the agricultural and retail sectors (Ohio History Central, 2021b). Large portions of the Project Area came under the ownership of the Waterloo Coal Company, who permitted large surface coal mining tracts in the 1980s and 1990s. The company, who is based out of Jackson County, Ohio, is a large supplier of coal, as well as limestone.

2.4 Historic Maps Review

Historic maps depict nineteenth- and twentieth-century settlement and development within the Historic Resources Study Area. Maps reviewed include the 1875 *Lake Atlas of Jackson County, Ohio* (Figure 6), the 1908 *Bidwell and Wilkesville, OH*, 1912 *Oak Hill, OH*, and 1913 *Jackson, OH* USGS topographic quadrangles (Figure 7), the 1914 *Mills Archaeological Atlas of Ohio* (see Figure 5), and the 1961 *Mulga, Oak Hill, Rio Grande, and Wellston, OH* USGS topographic quadrangles (Figure 8).

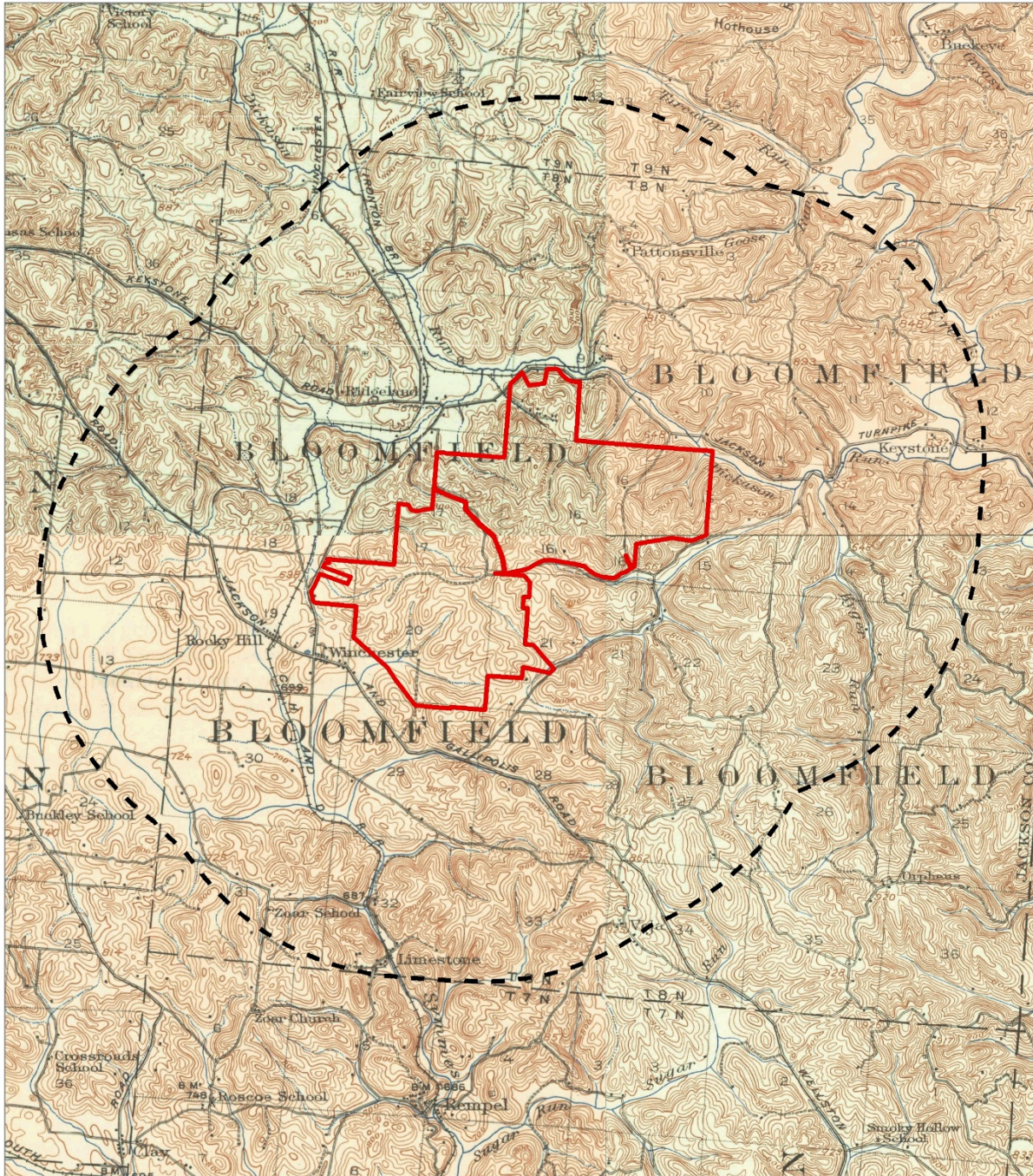


 Project Area
 Historic Resources Study Area



Basemap: 1875 Lake Atlas of Jackson County, Ohio
 This historic map has been georeferenced and is not intended to depict survey-accurate information.

Figure 6. 1875 Lake Atlas of Jackson County, Ohio

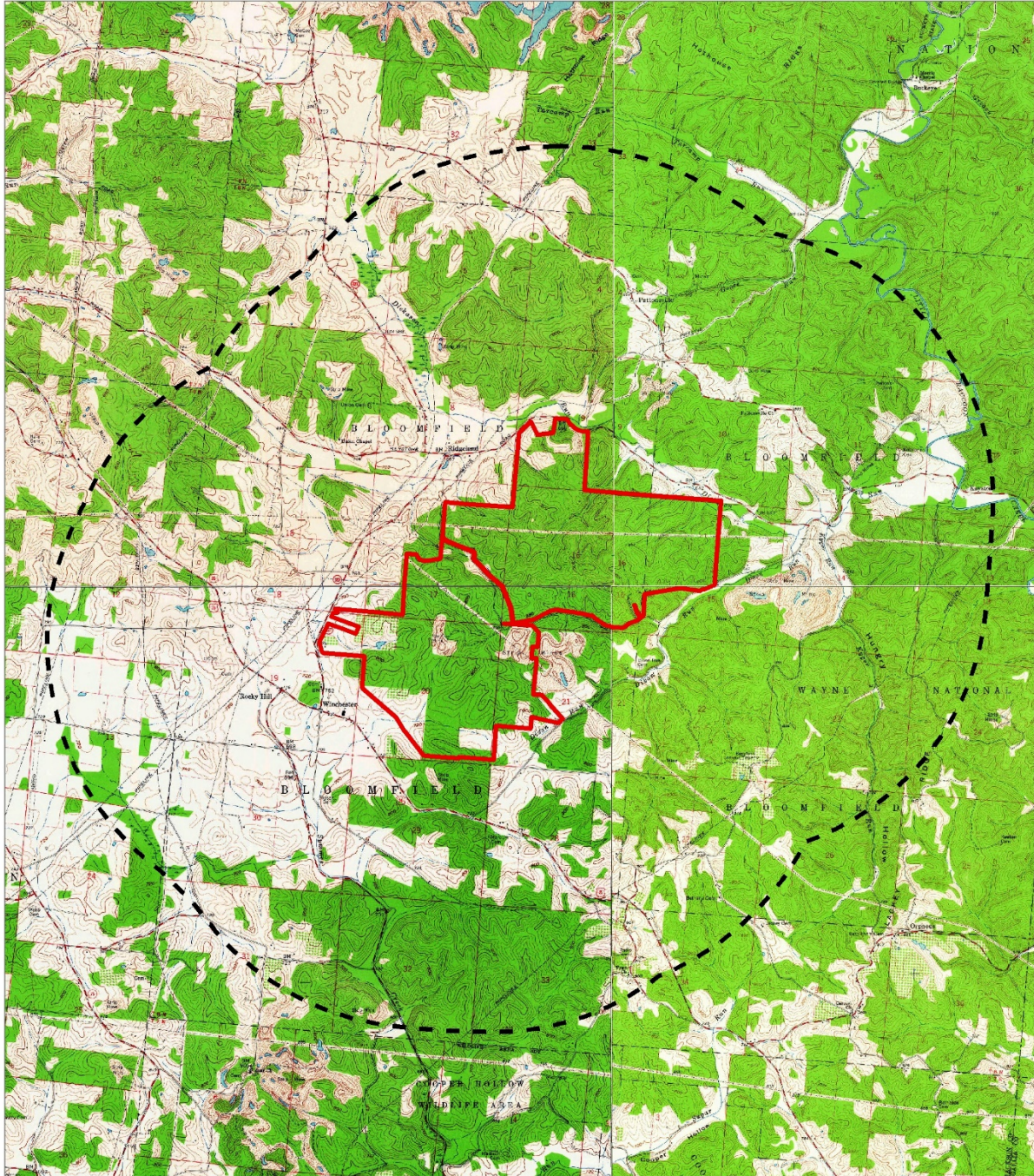


 Project Area
 Historic Resources Study Area

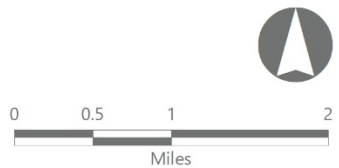


Basemap: 1908 Mills Bidwell, OH; 1908 Wilkesville, OH; 1912 Oak Hill, OH; and 1913 Jackson OH USGS Topographical Quadrangle Map
 This historic map has been georeferenced and is not intended to depict survey-accurate information.

Figure 7. 1908 Bidwell, OH; 1908 Wilkesville, OH; 1912 Oak Hill, OH; and 1913 Jackson, OH USGS Topographical Quadrangle Maps



 Project Area
 Historic Resources Study Area



Basemap: 1957 *Huntington, WV*; 1961 *Mulga, OH*; and 1961 *Wellston, OH* USGS Topographical Quadrangle Maps.
 This historic map has been georeferenced and is not intended to depict survey-accurate information.

Figure 8. 1961 Mulga, Oak Hill, Rio Grande, and Wellston, OH USGS topographic quadrangles

1875 Lake Atlas of Jackson County, Ohio

Figure 6 shows the primarily rural use of land in the mid-to-late-nineteenth century within the vicinity of the Project. The map depicts most townships in Jackson County divided into square grids and traversed by state roads and railroads. The Portsmouth branch of the Marietta & Cincinnati Railroad is also depicted and provided a north-south route, bisecting the western portion of the Historic Resources Study Area. The City of Wellston, the county seat at Jackson, the Village of Oak Hill are noted as the principal stops along the railroad as well as the main regional population centers.

1908 Bidwell and Wilkesville, OH, 1912 Oak Hill, OH, and 1913 Jackson, OH USGS topographic quadrangles

Figure 7 illustrates the continued dominance of agriculture into the early-twentieth century within the Project Area. The map depicts rural residences and farmsteads widely scattered along the local roadways, as well as rural schoolhouses dispersed throughout the region. By this time, the Marietta & Cincinnati Railroad became the Baltimore & Ohio (B & O) Railroad. Additionally, the Ironton branch of the Cincinnati, Hamilton & Dayton Railroad, a north-south route, opened through Bloomfield Township in the Historic Resources Study Area, connecting local furnaces with other regional markets. The City of Jackson remained the most developed settlement in the county and in the vicinity of the Project Area.

1914 Mills Archaeological Atlas of Ohio

The 1914 Mills *Archaeological Atlas of Ohio* (see Figure 5) was also reviewed. In addition to archaeological sites, the Mills *Atlas* also depicts the state of development throughout Ohio in 1914. The Atlas depicts the continued topographical pattern of local and regional transportation routes, as shown in earlier maps. The Cities of Wellston and Jackson, to the north and northwest, remain the primary centers of population and commerce in the county. Additionally, the transportation routes depicted within this map appear similar to current conditions.

1961 Mulga, Oak Hill, Rio Grande, and Wellston, OH USGS topographic quadrangles

The 1961 USGS maps depict little change from previous maps in the pattern of land use within the vicinity of the Project Area, with the exception of pipelines noted throughout the region (Figure 8). The B & O Railroad is still depicted running in a north-south route through the western part of the Historic Resources Study Area, and rural residences and farmsteads are widely dispersed along roadways. Despite the addition of U.S. and State Routes, and improvements to local roads, the area depicted appears predominantly rural.

By this time, the Historic Resources Study Area is bisected by State Route 327 and U.S. Route 35, both of which follow the same routes as local roads shown in earlier maps. The latter route abuts the southern boundary of the Project Area (see Figures 6 and 7). Also, the maps show one strip mine located within the Project Area and two strip mines located immediately to the north.

3.0 PROPOSED ARCHAEOLOGY SURVEY RESEARCH DESIGN

3.1 APE for Direct Effects

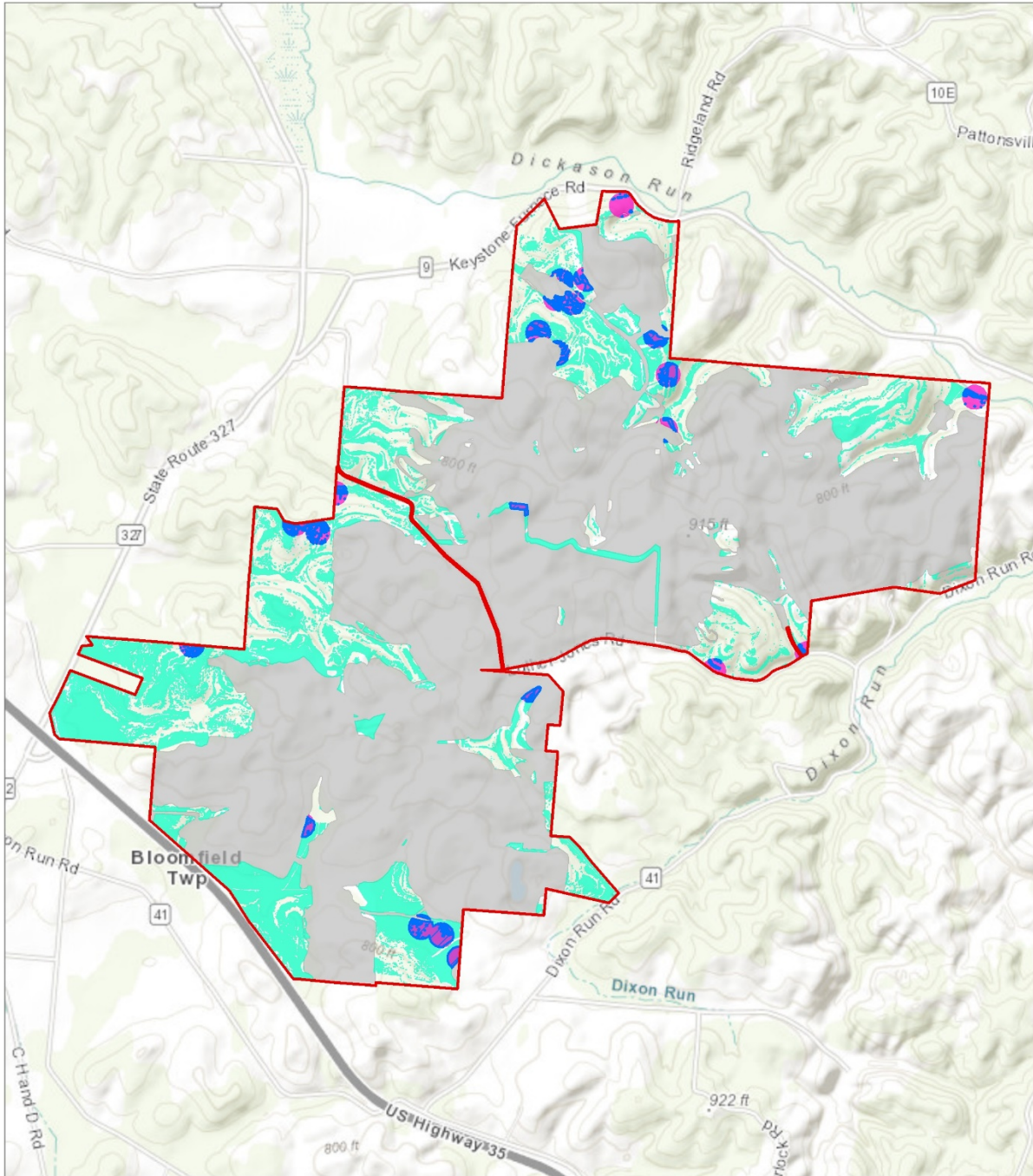
The APE for Direct Effects for the Project is defined as the area of potential soil disturbance (or other direct, physical impacts) that will result from Project construction. Preliminary components of the Project were discussed above in Section 1.3, and the APE for Direct Effects will occupy less than the overall 2,082-acre Project Area. The site layout provided herein (Figure 3) is preliminary and may be subject to change. However, for purposes of this Project, the entire Project Area—that has not been subject to prior disturbance—will be subject to Phase IB archaeological survey. This will provide design flexibility for any Project layout changes.



The solar panels will be mounted on racks with a relatively small footprint (in terms of soil disturbance), typically consisting of small I-beam posts driven into the ground. In addition, relatively minor ground disturbance will occur during installation and construction of the Project's substation, access roads, electrical collection cables (which will be buried in trenches or run overhead within the panel racking), and other components.

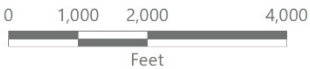
The majority of the Project Area is located within an area that has been subject to previous surface coal mining activity and has undergone significant prior ground disturbance. This soil disturbance is documented by the Ohio Department of Natural Resources (ODNR) *Mines of Ohio* GIS online database (ODNR, 2021) (Figure 9). During a field view visit on June 11, 2021, this prior ground disturbance was noted and photographed (see Appendix A: Photographs). In addition, a large electric transmission line corridor right-of-way bisects the Project Area. Furthermore, the Project Area is located within steep topography, with the PV panels located along south facing slopes. Therefore, the total ground disturbance during construction is anticipated to be minimal relative to the overall size of the Project Area. However, as mentioned above, the entire Project Area will be subject to archaeological investigations.

3.2 Archaeological Sensitivity Assessment

As noted above, the proposed Project is mostly located within a reclaimed strip mine that has undergone significant ground disturbance. The previously recorded archaeological sites located within the Project Area were identified as part of six previous cultural resource studies conducted as part of surface coal mining



-  Elevated Sensitivity for Both Pre-European Contact Native American and Historic-Period Archaeological Resources
-  Elevated Sensitivity for Pre-European Contact Archaeological Resources
-  Elevated Sensitivity for Historic-Period Archaeological Resources
-  No Archaeological Sensitivity based on Previous Surface Mining
-  Project Area



Basemap: Esri ArcGIS Online "World Topographic Map" map service.
Ohio Mine data provided by Ohio Department of Natural Resources

Figure 9. Archaeological Sensitivity Assessment

permitting activity (see Figure 4). Areas of the Project Area that were not subject to previous surface coal mining activities do not contain previously recorded cultural resources. It is assumed that the areas within the Project Area that have undergone previous surface coal mining and reclamation activities no longer contain archaeological sensitivity.

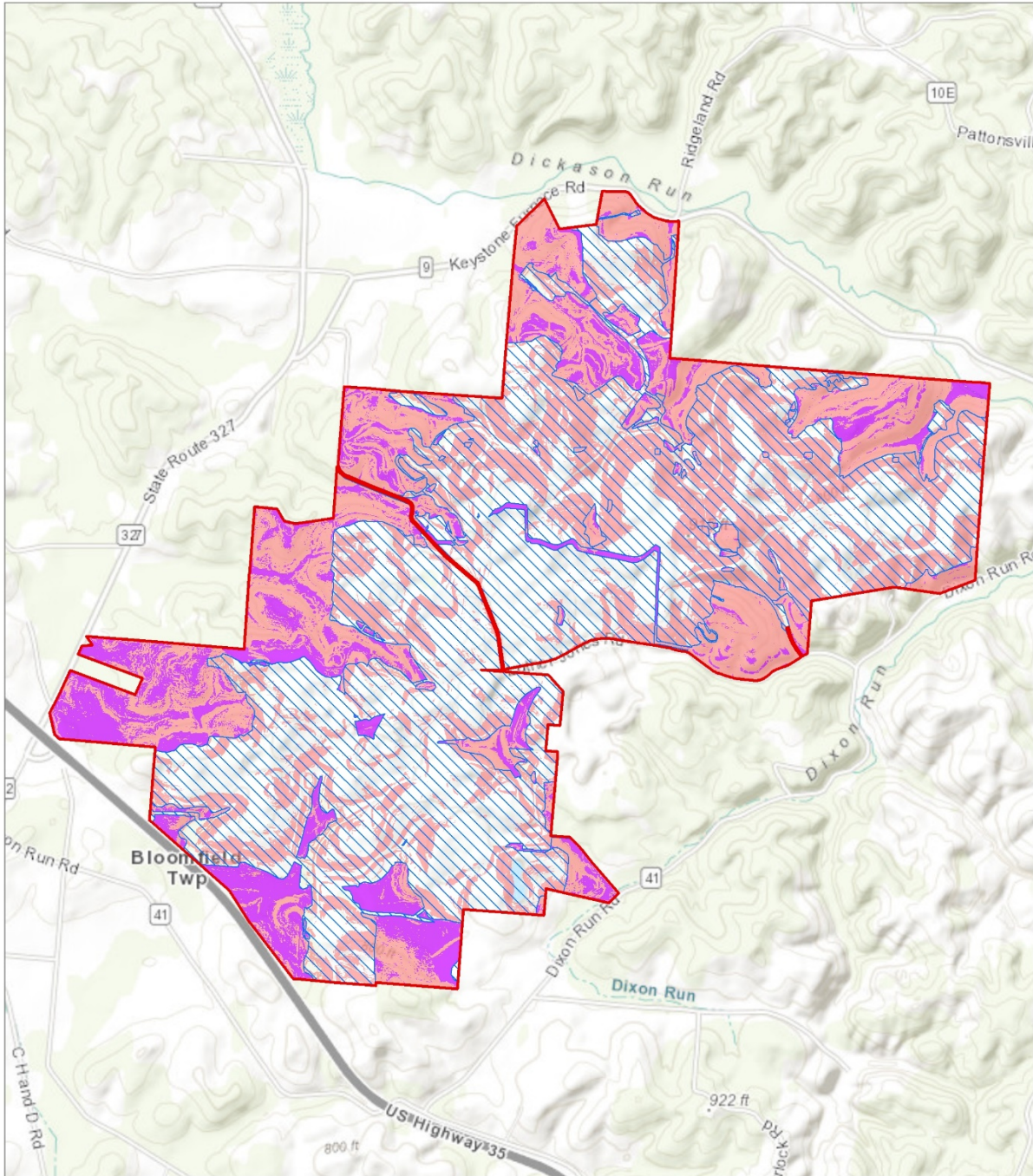
As described in Section 2.1, above, 14 previously recorded archaeological sites are located within the Project Area, resulting from six previous cultural resources survey conducted within the Project Area. As part of the research design, EDR assessed the probability of encountering archaeological resources within the Project Area based on review of the OHPO's Online Mapping System (OMS) (Ohio History Connection, 2021), the results of background research and historical map analysis, as well as GIS-based landscape/environmental analysis. The results of this assessment for Native American and historic-period archaeological resources is presented below.

3.2.1 Native American Archaeological Sensitivity

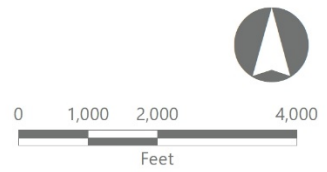
EDR prepared a GIS-based landscape analysis to identify areas of elevated archaeological sensitivity in the portions of the Project Area that have not been subject to surface coal mining and reclamation activities (Figure 10). The analysis included review of publicly available data sets for environmental variables, such as proximity to water resources and ground slope, as well as information from the Ohio Department of Natural Resources (ODNR) concerning prior soil disturbance due to surface coal mining activities that have occurred within the Project Area (ODNR, 2021). In addition to the environmental variables examined, the model also considers proximity to previously recorded Native American archaeological sites in areas that have not been subject to surface coal mining.

Based on this correlation, portions of the Project Area within 1,000 feet of naturally occurring streams and wetlands that have not been subject to surface coal mining are considered to have an elevated sensitivity for containing Native American archaeological material (see Figure 10), while areas more than 1,000 feet from naturally occurring streams and wetlands in areas not subject to surface coal mining are considered to have a reduced sensitivity for containing such material.

Per the National Wetlands Inventory (NWI) mapping, aquatic resources are organized by type, and include riverine, pond, lake, emergent wetland, forested/shrub wetland, and "other," waterways/bodies. In line with



- Area Recommended for Archaeological Survey
- Areas Subject to Previous Surface Mining
- Steep Slope
- Project Area



Basemap: Esri ArcGIS Online "World Topographic Map" map service.

Figure 10. Recommended Archaeological Survey Areas

Nolan's (2014) research, this analysis revealed that riverine aquatic resources are a much stronger predictor of Native American site location than wetlands. Regardless, the Ohio History Connection (2020b) describes wetlands as some "of the most archaeologically sensitive areas in Ohio."

Data sources used for streams and wetlands include the NWI mapped streams and wetlands. In order to eliminate as many artificial waterways or waterbodies from consideration, any mapped streams with Canal, Ditch, or Cutoff in the name were eliminated from consideration. Additionally, any unnamed mapped streams occurring in straight lines, containing right angles, and/or aligned with the road-grid were also eliminated from consideration. Any ponds which appeared to be man-made were also excluded. It is important to note that additional artificial streams or waterbodies may be identified in the field by archaeological survey crews and, therefore, the archaeological sensitivity model may be adjusted slightly as a result of the archaeological fieldwork.

Proximity to streams and wetlands appears to be the most powerful environmental factor influencing Native American settlement in this area. Based on the analysis of similar sites and contexts, EDR has found that a majority of Native American sites are located within 1,000 feet (305 meters) of a mapped stream or wetland. EDR has also examined the relationship between Native American sites and soil drainage and found that a majority of sites occur in soil areas that are moderately well drained. Soil drainage characteristics are derived from Soil Survey Geographic Database (SSURGO) data. In addition, least-cost pathways represent the shortest travel distance between archaeological sites, taking into consideration avoidance of steep topography and proximity to water resources.

3.2.2 Historic-Period Archaeological Sensitivity

Map-documented structures (MDS) in the vicinity of the Project are generally located adjacent to existing roadways. In some instances, MDS represent existing buildings and/or farms. In other instances, they are abandoned structures that may now be represented only by archaeological remains. Potential archaeological resources associated with these MDS locations could include abandoned residential, municipal (i.e., school), industrial, and/or farmstead sites, where the complete residential, municipal, industrial, and/or agricultural complex consisting of foundations, structural remains, artifact scatters, and other features, would constitute an archaeological site. In other locations, more limited remains of these sites, perhaps represented by only a foundation or an artifact scatter, may be present.

With respect to historic-period structures that are not map-documented, it is anticipated that any evidence for their presence in the Project Area will be revealed by the Phase I survey methodology detailed in Section 4 and in the OHPO *Archaeology Guidelines* (1994).

Areas located in the immediate vicinity (within approximately 200 feet) of MDS locations, that have not been subject to surface coal mining activities, are considered to have high potential for the presence of historic-period archaeological resources. Early historic-period occupation in the vicinity of the Project, however, may not always be map-documented. Early historic-period sites not appearing on early maps would likely be located within close proximity to the water resources. As such, the 1000-foot buffer for Native American archaeological resources would encompass early historic-period resources. The remaining (non-MDS) portions of the Project Area are considered to have reduced sensitivity to contain historic-period archaeological resources.

3.3 Phase I Archaeological Survey Methodology

It is proposed that the Phase I survey include archaeological investigation within areas of the entire Project Area that have not been subject to previous surface coal mining and reclamation activity, or subject to previous archaeological investigations, in accordance with the archaeological sensitivity model described above in Section 3.2. The Phase I survey methodology proposed in this survey strategy was designed in accordance with the *Archaeology Guidelines* (OHPO, 1994). The archaeological research design and sensitivity model are summarized below in Table 5 and depicted in Figure 10. It is proposed that Phase I archaeological investigations be conducted in 100% of all areas that show an elevated sensitivity for Native American and historic-period archaeological sensitivity. Those areas that are not considered to have elevated sensitivity for archaeological resources will be subjected to Phase I archaeological survey at a 50% sample. Furthermore, previously recorded archaeological sites within the Project Area will be visually inspected to ascertain site conditions. In addition, sloped areas above 12%, outside of previous mining activity areas, will be inspected for the presence of potential Native American rock shelters.

Table 5. Archaeological Sensitivity Model

Archaeological Sensitivity	Criteria	Recommended Phase I Survey Intensity
No Archaeological Sensitivity (previous surface mining activity)	Areas of significant ground disturbance due to prior surface coal mining and reclamation activity, per ODNR data	No archaeological survey
Elevated Sensitivity for Historic-Period Archaeological Material (outside previous surface mining areas)	<200 feet from historically map-documented structure in areas not subject to surface coal mining and reclamation activities	100% Phase I survey
Elevated Sensitivity for Native American Archaeological Material (outside previous surface mining areas)	<1,000 feet from naturally occurring stream/wetland in areas not subject to surface coal mining and reclamation activities	100% Phase I survey
Elevated Sensitivity for Both Historic-Period and PreContact Archaeological Material (outside previous surface mining areas)	<200 feet from historically map-documented structure and <1,000 feet from naturally occurring stream/wetland in areas not subject to surface coal mining and reclamation activities	100% Phase I survey
Reduced Sensitivity for Native American and Historic-Period Archaeological Material	>200 feet from historically map-documented structure and >1,000 feet from naturally occurring stream/wetland in areas not subject to surface coal mining and reclamation activities	50% sample Phase I survey

Within the areas of reduced sensitivity for archaeological resources, the methodology will increase the pedestrian survey interval to transects 20-meters apart, from the standard 10-meter, and/or conducting 8 shovel tests per acre rather than the normal 16, per guidance received in a meeting with OHPO on January 21, 2020.

It should be noted that the Project Area and APE for Direct Effects may change from the current acreages presented herein, as the Project layout may be modified following submission of this research design. However, any changes in the extent of the survey will be consistent with the archaeological sensitivity model and research design presented herein. The approach and level of effort proposed for the archaeological survey is expected to generate an adequate testing sample to evaluate the Project’s potential effect on archaeological resources.

3.3.1 Pedestrian Surface Survey

In areas with greater than 50% ground surface visibility within portions of the Project Area not previously subject to surface coal mining and reclamation activities or within areas previously subject to archaeological investigations, EDR personnel will conduct pedestrian surface surveys to determine whether archaeological sites are present. In these areas, archaeologists will traverse the Project Area along transects spaced at 30-foot (10-meter) intervals while inspecting the ground surface for artifacts and/or archaeological features. If any artifacts or other indications of an archaeological site are observed on the ground surface, then the location will be recorded using professional-grade Global Positioning System (GPS) equipment. Collected artifacts will be subjected to subsequent laboratory identification and analysis in accordance with standard archaeological methods. At least one 50 x 50-cm shovel test will be excavated at each archaeological site or isolated find to assess the subsurface stratigraphy and the potential for buried artifacts and features. These pedestrian survey methods will be used in both elevated and reduced areas for probability of archaeological resources, with the caveat that, as discussed above, only 50% of reduced probability areas will be surveyed.

In addition, EDR archaeologists will visit locations of previously recorded archaeological sites within areas previously subject to archaeological investigations and surface coal mining and reclamation activities to ascertain site condition. Likewise, EDR archaeologists will visually inspect sloped areas outside of the previous surface coal mining and reclamation and previous archaeological investigations areas to look for the presence of rock shelters.

3.3.2 Shovel Testing

In addition to the pedestrian surface survey described above, archaeologists will excavate shovel tests within portions of the Project Area not previously subject to surface coal mining and reclamation activities or within areas previously subject to archaeological investigations, with less than 50% ground surface visibility in order to determine whether archaeological sites are present per the *Archaeology Guidelines* (OHPO, 1994). Where conditions warrant, shovel tests will be excavated throughout the Project Area at 100% of elevated probability areas and at 50% of reduced probability areas, using the same sampling strategy described above.

Additionally, at least one shovel test will be excavated at each archaeological site or isolated find identified during the pedestrian surface survey in order to assess the subsurface stratigraphy and the potential for buried artifacts and features. Shovel tests will be 50 x 50 cm squares, excavated to a depth of at least 10 cm into the "B" horizon subsoil stratum. Shovel tests will be excavated in 10-cm arbitrary levels and/or by natural stratigraphic levels, depending on the stratigraphy encountered. Archaeologists will record the locations of shovel tests with professional-grade GPS equipment with real-time reported sub-meter accuracy (with all field data post-processed), while also noting shovel test locations on field maps. All soils excavated from shovel tests will be screened through 0.25-inch hardware cloth to ensure uniform recovery of cultural material. Archaeologists will record shovel test stratigraphic profile data on standardized field record sheets that include strata depth, Munsell soil colors, soil texture and inclusions, and any cultural materials (these data will be included in the final Phase I report).

3.3.3 Artifact Collection and Analysis

In the event that artifacts are collected during the survey, standard provenance information will be recorded in the field and the locations of all finds will be recorded using professional-grade GPS equipment and documented with field notes. All artifacts will be placed in temporary sealed plastic field bags labeled with provenance data. All collected artifacts will be retained by EDR for processing and placement in archival-grade polyethylene artifact bags. Clearly modern materials will not be recovered (however, the presence of these materials will be recorded in field notes and representative photos taken in the field, as appropriate).

Following the completion of fieldwork, all recovered materials will be washed, dried, and cataloged per standard archaeological laboratory procedures. Artifacts will be described (to the extent possible) according to their count, material, type, metric attributes, decorative motif, form, function, and cultural/temporal association. Artifact identification will be conducted according to standard references for Native American and historic-period artifacts. A complete listing of all recovered artifacts will be included as an appendix of the final Phase I report. Artifacts will be curated in accordance with Section V of the *Archaeology Guidelines* (OHPO, 1994).

3.4 Archaeological Site Avoidance/Minimization

It is anticipated that any potentially significant (i.e., potentially NRHP-eligible) archaeological sites identified during the survey will be avoided or minimized by Project design. Because of the flexible nature of solar

energy project components (in terms of siting constraints), it should be possible to avoid or minimize impacts to any potentially significant archaeological sites identified within the APE for Direct Effects through relatively minor modifications to the preliminary Project layout. In the event that a potentially NRHP-eligible archaeological site cannot be avoided by the Project, then additional site investigations and/ or mitigation would be explored with the OHPO.

In most instances, the types of finds noted below will not be considered NRHP-eligible. As such they are not expected to necessitate avoidance or additional archaeological investigations:

- isolated Native American finds,
- isolated historic period finds,
- small low-density lithic scatters that lack diagnostic artifacts and/or indications of intact subsurface features,
- low-density scatters of historic-period artifacts (particularly in agricultural fields, which likely represent artifacts associated with manuring practices that cannot be associated with specific households or contexts), and
- artifacts/deposits of clearly modern origin.

4.0 PROPOSED HISTORIC RESOURCES RESEARCH DESIGN AND SURVEY METHODOLOGY

This historic resources research design and survey methodology was prepared in accordance with the 2014 *OHPO Guidelines* and based on the cultural resources records review results presented in Section 2.0. The research design defines the APE for Indirect Effects on historic resources for the Project as a 2-mile buffer extending from the Project Area in which components of the Project may be visible. Additional detail about the APE for Indirect Effects is provided in Section 4.1.

The goal of this historic resources research design and survey methodology is to:

- Define the APE for Indirect Effects on historic resources for the Project (see Section 4.1);
- Establish the criteria by which historic resources will be evaluated (see Section 4.2);
- Propose a methodology for a reconnaissance survey of historic resources (see Section 4.3);
- Establish expectations regarding resource typologies and survey results (see Section 4.4); and
- Define the deliverables for the survey (Section 4.5).

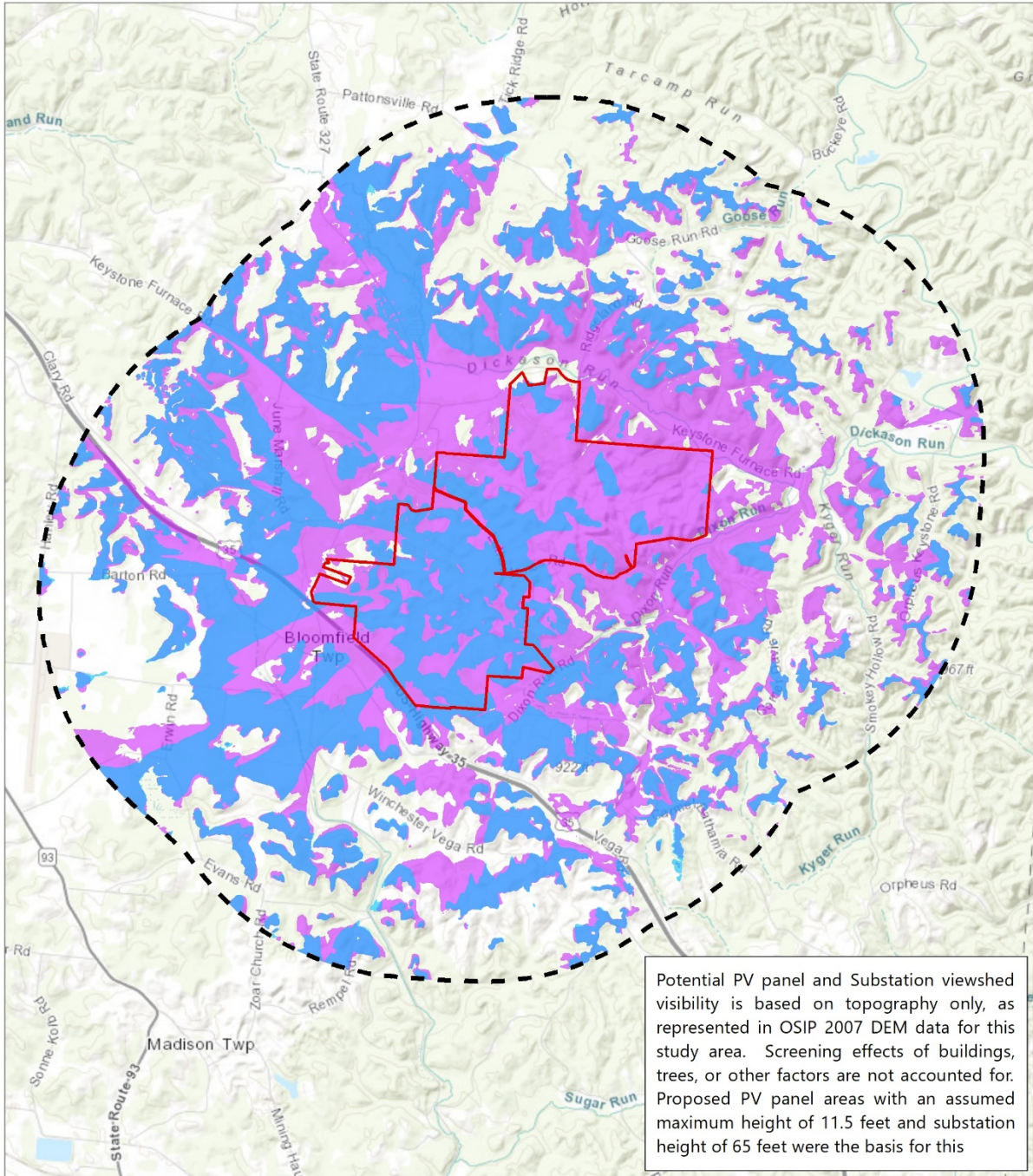
4.1 APE for Indirect Effects

The APE for Indirect Effects on historic resources includes those areas where the Project may result in indirect effects on cultural resources, such as audible or visual impacts. However, utility-scale solar facilities produce minimal noise, so auditory impacts resulting from the Project are not considered a significant type of impact to the setting of historic resources. The Project's potential indirect effect on historic resources would be potential visual impacts (resulting from the introduction of solar panels or other Project components) in the historic resource's setting.

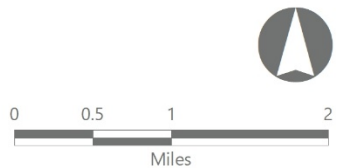
In order to accurately determine the Project's APE for Indirect Effects, a viewshed analysis for the proposed Project components was prepared using Environmental Systems Research Institute (ESRI) ArcGIS® software with the Spatial Analyst extension. The viewshed analysis was based on a digital elevation model (DEM), which conservatively only accounts for the screening effects of topography, and not buildings or vegetation.

Through simulations prepared for several previous Ohio solar projects, EDR has determined that the practical limits of solar panel visibility end at approximately two miles due to their relatively low height (typically less than 15-20 feet). Even at distances closer to one mile, it is challenging for rows of panels

installed on level ground to be discerned as such from the background and horizon. Furthermore, the visual effect of the substation is anticipated to be insignificant because the equipment will blend into the existing landscape from any open views beyond two miles and similar structures are common features of most landscapes. In addition, the dense vegetation surrounding the reclaimed strip mine that constitutes the proposed Project Area further contributes to the lack of distant Project views more than one mile away. Therefore, EDR proposes an appropriate APE for Indirect Effects for the Project includes those areas within a 2-mile buffer of the Project Area with potential visibility of the Project, as defined by the DEM viewshed results (see Figure 11).



- PV Panel Viewshed Visibility
- Substation Viewshed Visibility
- Project Area
- 2-Mile Historic Resources Study Area



Basemap: Esri ArcGIS Online "World Topographic Map" map service.

Figure 11. Viewshed Analysis

4.2 Criteria for Evaluating the Significance for Historic Resources

Historically significant properties are defined herein to include buildings, districts, objects, structures and/or sites that have been listed on, or determined eligible, for the NRHP. Criteria set forth by the National Park Service for evaluating historic properties (36 CFR 60.4) state that a historic building, district, object, structure or site is significant (i.e., eligible for listing on the NRHP) if the property is typically 50 years old or older and conveys certain characteristics (per CFR, 2004; NPS, 1990) as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- (A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) that are associated with the lives of persons significant in our past; or
- (C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) that have yielded, or may be likely to yield, information important in prehistory or history.

The historic resources survey will be conducted by qualified architectural historians and historians who meet the Professional Qualification Standards in the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (per 36 CFR 61). Expectations about the kind, number, location, character, and conditions of historic properties within the APE for Indirect Effects is discussed in Section 4.4.

In addition to the historic context and historic maps review (Sections 2.2 and 2.3 above), additional research will be conducted during fieldwork and production of the subsequent Historic Resource Survey Report to further place identified resources within their historic context and assist in NRHP eligibility evaluations.

4.3 Historic Resources Survey Methodology

EDR will conduct a historic resources survey for the Project to fulfill the requirements of the Application. The historic resources survey will be conducted in accordance with the 2014 *OHPO Guidelines*. Field observations and photographs, in conjunction with viewshed mapping, will provide the basis for evaluating the Project's potential effect on historic resources including buildings, structures, objects, sites, and districts.

EDR will conduct a reconnaissance-level historic resources survey of the Project's APE for Indirect Effects (i.e., areas within 2 miles of the Project where viewshed analysis indicates potential visibility). The historic resources survey will identify and document those buildings, sites, structures, objects, and/or districts within the APE that are 50 years old or older and, in the opinion of EDR's architectural historian, appear to satisfy NRHP eligibility criteria. In addition, the survey will also be conducted for the purpose of providing updated photographs and recommendations of eligibility for NRHP-listed and eligible resources, as well as previously designated OHI, ODOT, and OGS sites within the APE for Indirect Effects whose NRHP eligibility has not formally been determined. EDR will representatively photo-document previously unidentified historical resources 50 years old or older within the APE for Indirect Effects, that, in the opinion of EDR's architectural historians, do not meet NRHP-eligibility criteria. The purpose is to assist the OHPO with its determination regarding "which resources warrant further investigation and which resources, due to a lack of integrity, architectural significance, etc., do not" (OHPO, 2014). Representative photos of resource types deemed not eligible for NRHP listing will be provided in the subsequent historic resources survey.

Historic resources survey fieldwork will include systematically driving all public roads within the APE for Indirect Effects to evaluate historic resources within the Project viewshed. When those resources are identified, the existing conditions of the property will be documented. This includes photographs of the building(s) and property, a photograph of outbuildings, a brief description of the setting, estimated construction date(s), and field notes describing the style, physical characteristics and materials (e.g., number of stories, plan, external siding, roof, foundation, and sash), condition, and physical integrity for each resource. Other known criteria aside from architecture which may contribute to a property's NRHP eligibility will be noted and evaluated as well.

Evaluation of historic resources within the APE will focus on historic integrity (with respect to design, materials, feeling, and association) to assess the potential architectural significance of each resource.

However, physical condition will not be the primary determinant of inclusion, per the 2014 *OHPO Guidelines*, that instructs surveys are to include “vernacular and high style examples, paying attention to regional and repeated building types as they often reflect important patterns in regional or statewide development.” If deemed appropriate, individual buildings located within clusters will not be documented as individual properties, but instead will be described collectively as potential districts. EDR will document through field notes the extent to which the visual setting associated with these properties could be affected by the proposed Project.

All properties included in the historic resources survey will be photographed and assessed from public rights of way and evaluated based solely on the visible exterior of the structures. No inspections or evaluations requiring access to the interior of buildings, or any portion of private property, will be conducted as part of this assessment. Although the survey will focus on buildings that are over 50 years old with high architectural integrity, buildings that are less than 50 years in age with a distinctive architectural style, representing a physical expression of the modern period, or having historical significance through a historic theme as evaluated by EDR’s architectural historian also will be documented per the 2014 *OHPO Guidelines*.

4.4 Expected Survey Results

Six previously identified OHI-recorded resources, including one listed on the NRHP, and 18 OGS-designated cemeteries located within the Historic Resources Study Area suggests the likelihood that additional historical resources will be identified within the APE for Indirect Effects. Based on desktop research, buildings may include those typical of agricultural landscapes such as farmhouses, barns, and agricultural support buildings and rural schoolhouses, as well as resources associated with the region’s rich industrial history. In addition, later residential development is likely to be encountered along the main thoroughfares throughout the Historic Resources Study Area. Given the large number of OGS-identified cemeteries some may be eligible for NRHP listing based on Criterion Consideration D.

In addition, background research may identify properties that may be NRHP-eligible due to non-architectural associations (i.e. their significance is derived from associations with significant events or persons per National Register Criteria A and B). The Project Area itself predominately consists of reclaimed strip mine and does not include any population centers. Likewise, there are no significant population centers within the APE for Indirect Effects, but the communities of Winchester and Rocky Hill, constituting small

residential and agricultural development, are located to the south of the Project Area. Therefore, it is possible that historic residential, civic, commercial, resources will be newly identified along the major thoroughfares and local roads. Given the region's history of industrial and extractive activities, it is also likely that additional industrial resources will be identified within the Project Area.

4.5 Historic Resources Survey Report and Inventory Forms

EDR will prepare a stand-alone historic resources survey report following the format outlined in the 2014 *OHPO Guidelines* and updated *Survey Report Submission Requirements* (OHPO, 2020). Special attention will be paid to the viability of farmsteads and agricultural structures and industrial resources associated with the historic context developed for the Historic Resources Study Area.

Per the OHPO *Survey Report Submission Requirements* (OHPO, 2020), the historic resources survey report also will include completion of Ohio Historic Inventory Forms (I-Forms) for newly identified and OHI-designated historic properties within the APE that, in the opinion of EDR's architectural historians, meet or exceed the NRHP eligibility criteria using the OHPO I-Form Application Database, as required by the 2014 *OHPO Guidelines*. Information included will be appropriate to a reconnaissance-level survey. Prior to submitting the forms, EDR will contact the OHPO with a list of surveyed resources and addresses for each property so that OHI numbers can be assigned.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed Project is located predominately within an area that has been previously disturbed by surface coal mining activities. It is anticipated that the previously identified cultural resources located within the Project Area are no longer extant due to the surface mining activity for which they were identified, and the proposed Project will not directly (physically) impact any additional cultural resources. It is currently proposed that areas within the Project Area subject to previous surface coal mining and reclamation activities and/or previous archaeological investigations will not require systematic archaeological survey, and 100% of the Project Area identified as having elevated archaeological sensitivity (for either Native American or historic-period archaeology), and 50% of the Project Area identified as having reduced sensitivity for archaeological resources (for either Native American or historic-period archaeology) will be subjected to Phase IB archaeological survey. In addition, locations of previously recorded archaeological sites within areas of prior surface coal mining and reclamation activities will be visually inspected to ascertain site condition, and areas of slope located outside of previous surface coal mining and reclamation activities will be inspected for the presence of rock shelters.

The Project has the potential to cause visual impacts to aboveground historic resources within the Historic Resources Study Area where there are six OHI resources, including one listed on the NRHP, and 18 OGS cemeteries. Based on a review of historic maps, there may be several nineteenth century and/or early-twentieth century map-documented structures within the APE for Indirect Effects. To determine if there are extant or additional historic resources that could be affected by the Project, a reconnaissance survey for architectural resources will be conducted throughout the APE for Indirect Effects.

The cultural resources records review and research designs presented herein are provided to OHPO for approval in advance of submission of the cultural resource survey report, to evaluate the field methodologies, as well as to ensure that the proposed scope of the surveys is consistent with OHPO's standards. Please provide a formal response indicating OHPO's concurrence with and/or comments on the research design described herein.

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Appendix A
Photographs



Photo 1. Previously Mined and Reclaimed Area within Project Area, Facing North.



Photo 2. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing Northwest.



Photo 3. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing Northeast.



Photo 4. Previously Mined and Reclaimed Area and Transmission Line within Project Area, Facing East.