AEP OHIO TRANSMISSION COMPANY

An AEP Company

BOUNDLESS ENERGY

Application for Certificate of Environmental Compatibility and Public Need for the

GROVES ROAD – SHANNON 138 KV TRANSMISSION LINE PROJECT

OPSB Case No. 21-0199-EL-BTX

Submitted pursuant to O.A.C. 4906-5

AEP Ohio Transmission Company, Inc.

March 2022

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-02 PROJECT SUMMARY AND APPLICANT INFORMATION 2-1

(A) PROJECT SUMMARY 2-1

(1) General Purpose of the Facility 2-1

(2) General Location, Size, and Operating Characteristics of the Proposed Facility 2-2

(3) Suitability of the Preferred Route and Alternate Route for the Proposed Facility 2-2

(4) Project Schedule 2-4

(B) HISTORY, AFFILIATE RELATIONSHIPS, CURRENT OPERATIONS 2-4

(1) Company History 2-4

(2) Current Operations and Affiliate Relationships 2-4

4906-5-03 REVIEW OF NEED AND PROJECT SCHEDULE 3-1

(A) JUSTIFICATION OF NEED 3-1

(1) Purpose of the Proposed Facility 3-1

(2) System Conditions, Local Requirements and Other Pertinent Factors 3-2

(3) Load Flow Studies and Contingency Analyses 3-3

(4) System Performance Transcription Diagrams 3-3

(B) REGIONAL EXPANSION PLANS 3-3

(1) Proposed Facility in Long-Term Forecast 3-3

(C) SYSTEM ECONOMY AND RELIABILITY 3-4

(D) OPTIONS TO ELIMINATE THE NEED FOR THE PROPOSED PROJECT 3-4

(E) FACILITY SELECTION RATIONALE 3-4

(F) PROJECT SCHEDULE 3-5

(1) Schedule Gantt Chart 3-5

(2) Impact of Critical Delays 3-5

4906-5-04 ROUTE ALTERNATIVES ANALYSIS 4-2

(A) ROUTE SELECTION STUDY 4-2

(1) Study Area Description and Rationale 4-3

(2) Study Area Map 4-3

(3) Map of Study Area and Routes Evaluated 4-3

(4) Siting Criteria 4-3

(5) Siting Process for the Preferred Route and Alternate Route 4-9

(6) Route Descriptions and Rationale for Selection 4-10
(B) SUMMARY TABLE 4-12
(C) PUBLIC INVOLVEMENT 4-15
4906-5-05 PROJECT DESCRIPTION 5-1
(A) DESCRIPTION OF THE PROJECT AREA 5-1
(1) Geography and Topography 5-1
(2) Proposed Right-of-Way, Transmission Length, and Properties Crossed 5-4
(B) LAYOUT AND CONSTRUCTION 5-5
(1) Proposed clearing, construction methods, and reclamation operations 5-5
(2) Facility Layout 5-7
(C) TRANSMISSION EQUIPMENT 5-8
(1) Electric Transmission Line Data 5-8
(2) Electric Transmission Station Data 5-9
(3) Gas Transmission Line Data 5-9
4906-5-06 ECONOMIC IMPACT AND PUBLIC INTERACTION 6-2
(A) OWNERSHIP OF PROPOSED FACILITY 6-2
(B) ELECTRIC CAPITAL COST 6-2
(C) GAS CAPITAL COST 6-3
(D) PUBLIC INTERACTION INFORMATION 6-3
(1) Counties, Townships, Villages, and Cities Within 1,000 feet of the Preferred and Alternate Routes 6-3
(2) Public Officials Contacted 6-3
(3) Public Information Programs 6-3
(4) Liability Compensation 6-4
(5) Tax Revenues 6-4
4906-05-07 HEALTH AND SAFETY, LAND USE, AND REGIONAL DEVELOPMENT 7-1
(A) HEALTH AND SAFETY INFORMATION FOR EACH ALTERNATE ROUTE .. 7-1
(1) How the facility will Comply with State/Federal Regulations 7-1
(2) Electric and Magnetic Fields 7-2
(3) Provide Estimate of the Level of Radio, Television, and Communications Interference from Operation of Facility. Identify Mitigation if Needed. 7-9
(4) Noise Generation from Construction, Operations, and Maintenance of the Transmission Line 7-10
(B) LAND USE 7-11

(1) Map of Land Use 7-11
(2) Impact of Facility on Each Land use 7-11
(3) Impact on Identified Nearby Structures 7-15
(C) AGRICULTURAL DISTRICTS AND IMPACTS TO AGRICULTURAL LAND 7-18
(1) Agricultural Land Use/Districts Map 7-18
(2) Impacts to Agricultural Lands and Agricultural Districts 7-18
(D) REGIONAL LAND USE PLANS AND DEVELOPMENT 7-21
(1) Impacts to Regional Development 7-21
(2) Compatibility of Proposed Facility with Current Regional Land Use Plans 7-21
(E) CULTURAL AND ARCHAEOLOGICAL RESOURCES 7-21
(1) Cultural Resources Map 7-22
(2) Cultural Resources in Study Corridor 7-22
(4) Mitigation Procedures 7-23
(5) Aesthetic Impact 7-23
4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS 8-1
(A) ECOLOGICAL MAP 8-1
(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS 8-1
(1) Vegetative Communities, Wetlands, and Streams in Study Area 8-2
(2) Delineation Result Mapping 8-14
(3) Construction Impacts on Vegetation and Surface Waters 8-14
(4) Operation and Maintenance Impacts on Vegetation and Surface Water 8-19
(5) Mitigation Procedures 8-20
(C) LITERATURE SURVEY OF THE PLANT AND ANIMAL LIFE POTENTIALLY AFFECTED BY THE FACILITY 8-23
(1) List of species Identified Within Project Vicinity 8-23
(2) Construction Impact 8-41
(3) Operation and Maintenance Impact 8-41
(4) Mitigation Procedures 8-42
(D) SITE GEOLOGY 8-42
(1) Local Geology 8-42
(2) Slopes and Soil Suitability for Foundation Construction 8-42

(E) ENVIRONMENTAL AND AVIATION COMPLIANCE INFORMATION 8-44
(1) List and Discussion of Permits Required 8-44
(2) Description, Quantification, Characterization, Removal, and Disposal of Construction Debris 8-44
(3) Storm Water and Erosion Controls during Construction and Restoration of Soils, Wetlands, and Streams Disturbed as a Result of Construction of the Facility 8-45
(4) Plans for Disposition of Contaminated Soil and Hazardous Materials Generated or Encountered During Construction 8-47
(5) Maximum Height of Above Ground Structures 8-48
(6) Construction during Excessively Dusty or Excessively Muddy Soil Conditions 8-49

Tables

Table 4-1. Quantitative Siting Criteria 4-5
Table 4-2. Summary of Route Selection Factors 4-12
Table 6-1. Estimates of Applicable Intangible and Capital Costs 6-1
Table 7-1. Grounding Clearances, Right-of-Way, and Projected Loading 7-4
Table 7-2. Magnetic Fields from Household Electrical Appliances and Devices 7-4
Table 7-3. Acreage and Percent of Land Uses 7-12
Table 7-4. Structures within 200 feet of Proposed 60-foot Right of Way 7-16
Table 8-1. NWI Wetlands within 1,000 feet of the Preferred Route and Alternate Route 8-5
Table 8-2. Delineated Wetlands within the Preferred Route and Alternate Route Survey Corridor 8-8
Table 8-3. Streams within the Preferred Route and Alternate Route Survey Corridor 8-12
Table 8-4. Approximate Vegetation Impacts Along the ROW 8-15
Table 8-5. ODNR and UFSWS Listed Species within the Project Area 8-26

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-02 PROJECT SUMMARY AND APPLICANT INFORMATION 2-1

(A) PROJECT SUMMARY 2-1

(1) General Purpose of the Facility 2-1

(2) General Location, Size, and Operating Characteristics of the Proposed Facility 2-2

(3) Suitability of the Preferred Route and Alternate Route for the Proposed Facility 2-2

(4) Project Schedule 2-4

(B) HISTORY, AFFILIATE RELATIONSHIPS, CURRENT OPERATIONS 2-4

(1) Company History 2-4

(2) Current Operations and Affiliate Relationships 2-4

4906-5-02 PROJECT SUMMARY AND APPLICANT INFORMATION

(A) PROJECT SUMMARY

AEP Ohio Transmission Company, Inc. (the Company) is seeking the approval of the Ohio Power Siting Board (OPSB) to construct a new, approximately 5 to 7 mile long, 138 kV transmission line through Blacklick Estates, the City of Columbus, the Village of Brice, and Truro and Madison townships in Franklin County, Ohio (Project). The Project is part of the overall Southeast Columbus Area Improvements Project, which aims to improve the reliability of the electric transmission grid in Franklin County, Ohio. The proposed transmission line will connect the Groves Road Station to the Shannon Station. Route Alternatives considered as part of the route selection process are displayed in **Appendix 4-1**. **Figure 2-1**, Project Overview, provides a general overview of the entire Project Area. Project construction will be phased and is anticipated to begin in October 2023 and end in November 2024

(1) General Purpose of the Facility

The purpose of this Project is to address asset renewal and structural overloading issues associated with the existing Groves Road-Refugee 138 kV line, as well as several other lines in the vicinity, including the Astor – Brice 138kV, Brice – Shannon – Groves 138kV, and Shannon – Bixby 138kV circuits.

The proposed solution will also eliminate a three-terminal line at Refugee Switch, by rebuilding the 1.4 mile 138 kV section of transmission line between Shannon Station and the former Refugee Switch as double circuit, rebuilding 0.7 mile of the existing Refugee – Groves Road 138 kV Transmission Line, rebuilding approximately 1 mile of the existing Shannon – Astor 138 kV Transmission Line, constructing 3.6 miles of greenfield 138 kV line between Groves Road Station and Shannon Station, and installing a new breaker at Shannon Station to accommodate the new line from Groves Road Station. The new double circuit configuration creates individual circuits between Groves Road and Shannon stations and between Shannon and Brice stations. This configuration allows for proper sectionalizing on the individual circuits which will reduce the risk of mis-operations and over tripping created by the three terminal line in the current configuration around Refugee Switch. As a result, the Refugee Switch will be retired as part of the Project.

Additional details can be found in this application's Review of Need and Schedule, in Section 4906-5-03.

(2) General Location, Size, and Operating Characteristics of the Proposed Facility

The Project begins at the existing Groves Road Station located 0.4 mile west of the intersection of Courtright Road (CR 114) and Groves Road (CR 510). The Project continues 5.8 miles east and south to the existing Shannon Station located 0.5 mile east of the intersection of Shannon Road (CR 118) and Brice Road (CR 117). The Project passes through the City of Columbus, Blacklick Estates, the Village of Brice, and Truro and Madison townships in Franklin County, Ohio. The Project will require a 60-foot-wide permanent right-of-way (ROW). **Figure 2-1** shows the Project endpoints and the Preferred Route and Alternate Route identified by the Company.

(3) Suitability of the Preferred Route and Alternate Route for the Proposed Facility

The Company identified a Preferred Route and an Alternate Route (**Figure 2-1**, and as detailed in **Appendix 4-1**) after conducting a Route Selection Study (RSS). The RSS documents the selection process of the routes and is discussed in detail in Section 4905-5-04 of this Application.

The goal of the RSS was to understand the constraints and opportunities in the study area, to develop route alternatives, evaluate potential impacts associated with the route alternatives, and identify a Preferred Route and Alternate Route. The Preferred Route is the route that (1) is most consistent with the Company's siting guidelines (see **Section 2.4** of **Appendix 4-1**); (2) reasonably minimizes adverse impacts on the natural and human environments; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner. The Preferred Route and Alternate Route are both constructible and were selected by the Company for consideration by the Ohio Power Siting Board (OPSB) in this Application. Approximately 3 miles of the existing Shannon-Astor 138 kV Transmission Line is proposed to be rebuilt in a double circuit configuration as part of the Preferred Route. If the Alternate Route is selected, this section of transmission line would still be required to be rebuilt, as a single circuit, as part of the overall Southeast Columbus Area Improvements Project.

Per O.A.C. 4906-3-05, the Preferred Route and the Alternate Route are no more than 20 percent in common and therefore can be considered as alternatives.

(i) Preferred Route

The Preferred Route from the existing Groves Road Station to the existing Shannon Station is approximately 6.6 miles long.

The Preferred Route begins at the Groves Road Station and heads eastward by rebuilding approximately 0.6 mile of the existing Refugee – Groves Road 138 kV transmission line in existing ROW before crossing OH-317 and routing northward for 0.6-mile, paralleling Groves Road and Cloverleaf Street. At this point, the Preferred Route travels in a general southeastward direction for approximately 2.3 miles by paralleling the northside of a railroad corridor. For its remaining approximately 3 miles, the Preferred Route travels southward by primarily rebuilding the existing Shannon – Astor 138 kV transmission line in existing, maintained ROW and ties into the Shannon Station. Of the approximately 3 mile rebuild portion of the Shannon – Astor 138 kV line, approximately 0.4 mile will require a greenfield double-circuit re-route to avoid residential development south of Refugee Road; the re-route parallels road and parcel boundaries. An additional 0.1 mile greenfield portion is required as the double circuit line is routed into the Shannon Station as two single-circuit lines.

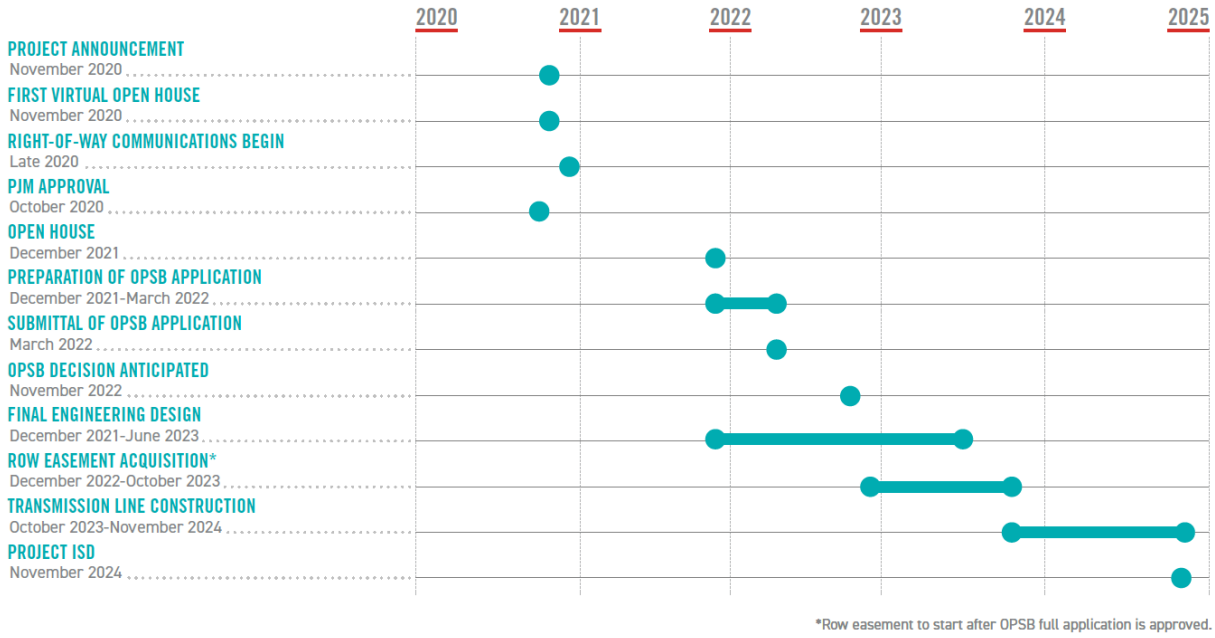
(ii) Alternate Route

The Alternate Route from the existing Groves Road Station to the existing Shannon Station is approximately 5.2 miles long.

The Alternate Route begins at Groves Road Station and routes southward by rebuilding the existing Refugee – Groves Road 138 kV Transmission Line for 0.2 mile. The Alternate Route continues southward for approximately 1.9 miles by paralleling the westside of the existing Bixby – Groves Road 138 kV Transmission Line within unmaintained, but existing ROW. At this point, the Alternate Route heads southeastward primarily by paralleling Winchester Pike and Shannon Road for approximately 3 miles, only crossing the roads to avoid encroaching residential or commercial properties. The remaining 0.1 mile of the Alternate Route proposes rebuild of the existing Shannon – Astor 138 kV Transmission Line for tie-in to Shannon Station.

(4) Project Schedule

The current Project schedule is illustrated in the diagram below.



(B) HISTORY, AFFILIATE RELATIONSHIPS, CURRENT OPERATIONS

(1) Company History

The Company is a public utility as defined by Ohio Revised Code 4905.02 and 4905.03 and is engaged in the business of supplying electric transmission and distribution service to customers in Ohio.

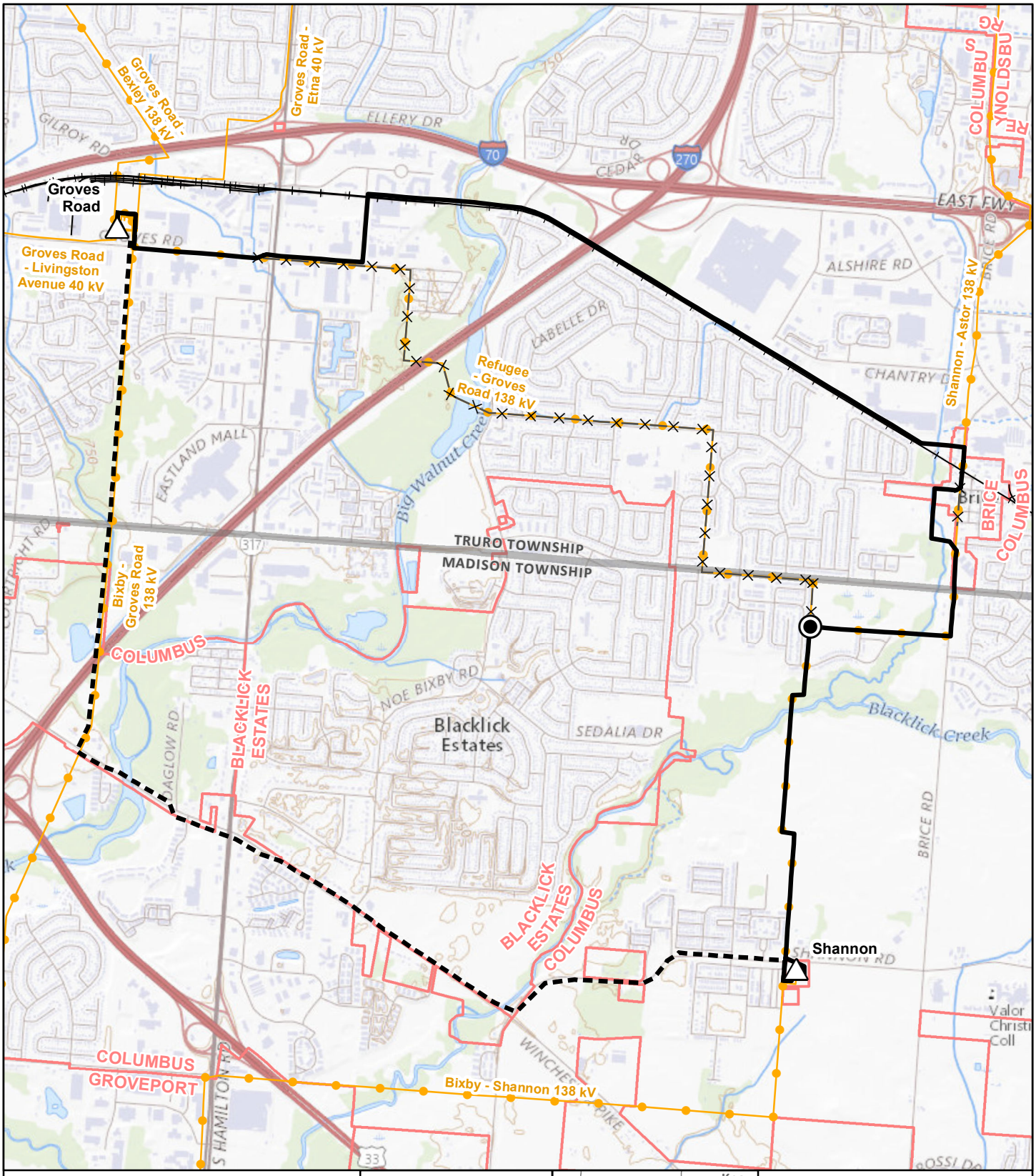
(2) Current Operations and Affiliate Relationships

The Company was originally incorporated in 1906 as the American Gas and Electric Company. The Company's earliest utility properties provided electric, gas and other services in communities in New Jersey, New York, Pennsylvania, West Virginia, Ohio, Indiana, and Illinois. The Company became AEP in 1958 and merged with Central and Southwest Corporation in 2000.

The Company is one of the largest electric utilities in the United States, delivering electricity to approximately 5.5 million customers through 223,000 miles of distribution lines in 11 states. The Company owns the nation's largest electricity transmission system, which is a network comprised

of more than 40,000 miles and includes more 765-kilovolt extra-high voltage transmission lines than all other U.S. transmission systems combined. The Company also ranks among the nation's largest generators of electricity, owning approximately 30,000 megawatts of generating capacity in the U.S. The Company's utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia and West Virginia), Wheeling Power (West Virginia), AEP Appalachian Power (in Tennessee), Indiana Michigan Power Company, Kentucky Power, Public Service Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana, and east Texas). News releases and other information about the Company can be found at www.AEP.com. AEP Ohio provides electricity to over 1.5 million customers in Ohio. News and information about AEP Ohio can be found at www.AEPOhio.com.

FIGURE



- Existing Station
- Refugee Switch (to be removed)
- Preferred Route (A)
- Alternate Route (B)
- Existing Transmission Line to be Retired

Existing Transmission Line

- 69 kV and below
- 138 kV
- 345 kV
- Railroad
- Municipal Boundary
- Township Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), USGS (2013, 2021)

Coordinate System:
State Plane Ohio South NAD 1983

March 3, 2022



Figure 2-1
Project Overview

AEP OHIO TRANSMISSION COMPANY

Groves Road - Shannon
138 kV Transmission Line

0 0.25 0.5 Miles

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-03 REVIEW OF NEED AND PROJECT SCHEDULE 3-1
(A) JUSTIFICATION OF NEED 3-1
(1) Purpose of the Proposed Facility 3-1
(2) System Conditions, Local Requirements and Other Pertinent Factors 3-2
(3) Load Flow Studies and Contingency Analyses 3-3
(4) System Performance Transcription Diagrams 3-3
(B) REGIONAL EXPANSION PLANS 3-3
(1) Proposed Facility in Long-Term Forecast 3-3
(C) SYSTEM ECONOMY AND RELIABILITY 3-4
(D) OPTIONS TO ELIMINATE THE NEED FOR THE PROPOSED PROJECT 3-4
(E) FACILITY SELECTION RATIONALE 3-4
(F) PROJECT SCHEDULE 3-5
(1) Schedule Gantt Chart 3-5
(2) Impact of Critical Delays 3-5

4906-5-03 REVIEW OF NEED AND PROJECT SCHEDULE

(A) JUSTIFICATION OF NEED

The existing Groves Road-Refugee 138 kV line rebuild Project is part of a larger area project to rebuild several 138 kV lines in the Columbus, Ohio area. The Groves Road-Refugee line was originally constructed in 1952 using a mix of wood and steel pole structures. The level of deterioration on the line has reached the point which repairs are no longer sufficient and the line needs to be rebuilt. There are 43 open conditions on this line section which affect approximately 45% of the total structures. These conditions include split/rotted poles, missing/broken guying and ground leads, and insulator issues. There have been two momentary outages and three permanent outages between 2015 and 2020 for an average of 17.65 hours, resulting in 2,732,043 customer minutes of interruption on this line. A recent engineering analysis of the line identified that approximately 33% of the line structures are currently physically overloaded under NESC heavy loading conditions. The Company does not operate line assets to failure.

This line section is also part of a three terminal line on the Astor-Groves-Shannon 138 kV circuit which limits sectionalizing and can cause mis-operations and over tripping. The solution will retire part of the existing Groves Road-Refugee 138 kV line (2.4 miles) and re-route it to Shannon Station (3.6 miles), while the remaining section will be rebuilt in place (0.7 mile).

An additional benefit for a portion of the Project is that it would support the build out of telecom connectivity for SCADA, fiber networking, and relaying requirements that continues to increase in the area. The required telecom fiber to be installed along the Shannon-Astor line and supports communication between the Astor and Shannon substations. If the required telecom fiber is added to the existing structures and the line is not rebuilt, the number of structures deemed overloaded under NESC heavy loading conditions would increase. Furthermore, additional structures would need to be installed to support the new telecom fiber.

Failure to move forward with the Project could lead to safety concerns on the structures, particularly because portions of this line parallel public roadways and these overloaded structures could have an impact on public safety. Failure to rebuild this line would also exacerbate the risk

of outages to customers. There have been two momentary outages (2015-2020) on this line that serves up to 106 MVA of customer load at AEP Ohio's Astor, Shannon and Brice stations. Retiring this line is not feasible as it would radialize several stations in the greater Columbus area.

(1) Purpose of the Proposed Facility

The purpose of the Project is to address asset renewal and structural overloading issues associated with the existing Groves Road-Refugee 138 kV line, as well as several other lines in the vicinity, including the Astor – Brice 138kV, Brice – Shannon – Groves 138kV, and Shannon – Bixby 138kV circuits.

The proposed solution will also eliminate a three-terminal line at Refugee Switch, by rebuilding the 1.4 mile 138 kV section of transmission line between Shannon Station and the former Refugee Switch as double circuit, rebuilding 0.7 mile of the existing Refugee – Groves Road 138 kV Transmission Line, rebuilding approximately 1 mile of the existing Shannon – Astor 138 kV Transmission Line, constructing 3.6 miles of greenfield 138 kV line between Groves Road Station and Shannon Station, and installing a new breaker at Shannon Station to accommodate the new line from Groves Road Station. The new double circuit configuration creates individual circuits between Groves Road and Shannon stations and between Shannon and Brice stations. This configuration allows for proper sectionalizing on the individual circuits which will reduce the risk of mis-operations and over tripping created by the three terminal line in the current configuration around Refugee Switch. As a result, the Refugee Switch will be retired as part of the Project.

(2) System Conditions, Local Requirements and Other Pertinent Factors

The Groves Road-Refugee 138kV transmission line is currently overloaded under NESC heavy loading conditions. Approximately 33% of the existing line is currently overloaded and is unable to support necessary telecom fiber required in the area. The line section is also part of a three terminal circuit (Astor-Groves-Shannon 138 kV circuit), which limits sectionalizing and can cause mis-operations and over tripping.

(3) Load Flow Studies and Contingency Analyses

Load flow analysis is not driving the need for the Project. As mentioned in previous section, the need was driven by the requirement to address physically overloaded structures along the Groves Road-Refugee 138 kV line. The new line with reconfigured connections will help strengthen the local network feeding critical customers from Shannon Station.

Please note that any load flow analyses would be the product of the PJM do-no-harm analysis as required by the M-3 process, which did not identify any reliability concerns with the Project. Any load flow requests should be submitted to PJM referencing project s2282 per the CEII requirements.

(4) System Performance Transcription Diagrams

Transcription diagrams would be of limited benefit for this Project because it is a supplemental project driven by physical overloading on the existing Groves Road-Refugee 138 kV line. The Project is not intended to resolve thermal overloads on the AEP Transmission system. Therefore, transcription diagrams have not been included in this application.

(B) REGIONAL EXPANSION PLANS

(1) Proposed Facility in Long-Term Forecast

(a) Reference in Recent Long-Term Forecast

This Project is referenced in AEP Ohio Transco's 2021 Long-Term Forecast Report on page 86 (FE-T9 Planned Transmission Lines table).

(b) Explanation if Not Referenced

Not applicable, see Section 4906-5-03(B)(1)(a) directly above.

(c) Reference in Regional Expansion Plans

The Project was submitted to PJM as a supplemental reliability improvement project and the need and solution were presented on November 29, 2018, and June 19, 2020 at the PJM Subregional RTEP Committee-Western meetings, respectively. The Project was subsequently assigned PJM supplemental number s2282.

(C) SYSTEM ECONOMY AND RELIABILITY

The Project will improve reliability by providing proper sectionalizing on the three terminal line and mitigating the NESC heavy loading overloaded conditions. This line serves as a source for approximately 106 MVA of load in an urban area of southeastern Columbus. Failure to improve the condition of the existing facilities may result in increased outages to customers served by the approximately 7.7 miles of 138 kV lines affected by the three terminal configuration. The Project was not driven by circuit loading concerns. Load flow studies completed by PJM and AEP planning found no adverse effects due to the Project.

(D) OPTIONS TO ELIMINATE THE NEED FOR THE PROPOSED PROJECT

The following electrical alternative was considered before proceeding with this Project. The proposed alternative was not selected to meet the Project need, as explained below:

Replacing the existing Refugee Switch with a station to eliminate the three terminal point on the circuit was considered but the ROW and siting challenges associated the Groves – Refugee line section eliminated this as a feasible alternative.

Retiring this line to address the identified needs is not feasible as it would negatively impact reliability to several stations in the greater Columbus area. Service into the stations would be reduced to a single radial transmission line. These stations would include Shannon, Shannon Rd Switch (Southcentral Power), Brice, and Astor stations which provide service to over 42,800 customers. Additionally eliminating the existing Groves Road-Refugee 138 kV line would erode the reliability of other stations in the area.

(E) FACILITY SELECTION RATIONALE

The proposed Project is needed to address the physical overloading on the existing Groves Road-Refugee 138 kV line. The proposed solution will install structures capable of handling new telecom fiber required in the area for modern relays to operate. The proposed solution will also eliminate the deteriorated condition of the existing line as well as the NESC heavy loading concerns that the line is currently experiencing today. The Groves Road-Refugee 138 kV line, as well as several others proposed to be rebuilt in the area (Astor – Brice 138kV, Brice – Shannon – Groves 138kV, and Shannon – Bixby 138kV circuits) serve 106 MVA of load in a densely congested area near downtown Columbus.

(F) PROJECT SCHEDULE

(1) Schedule Gantt Chart

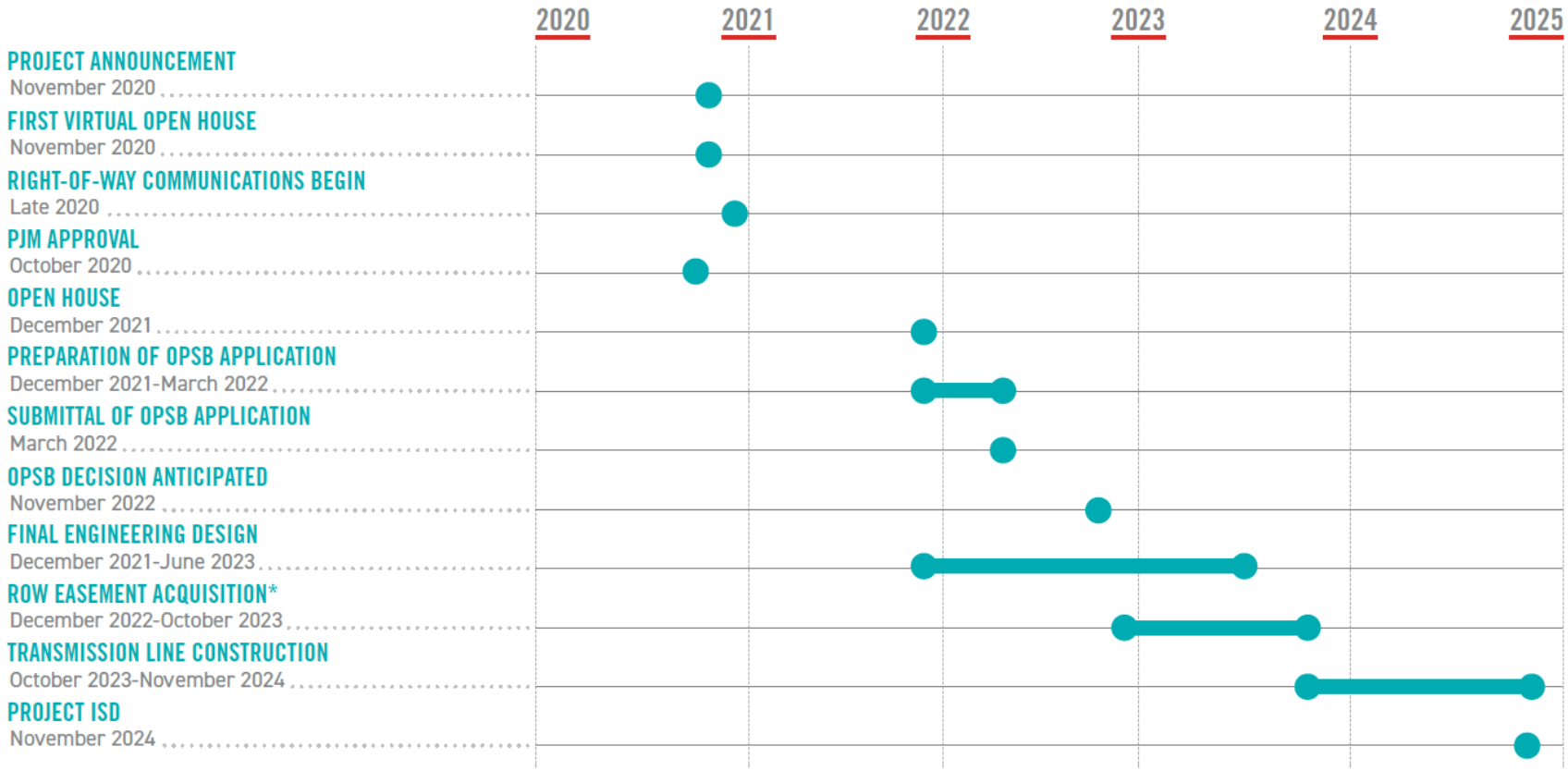
Figure 3-1 on the following page provides the project schedule as a Gantt bar chart. Construction of the Project is planned to begin in October 2023, and the anticipated in-service date is November 2024.

(2) Impact of Critical Delays

Failure to move forward with this project could lead to structure failures, additional poles required for a fiber install between these two stations, and increase risk of outages to customers as the line continues to deteriorate. In addition, since this line parallels public roadways, these overloaded structures could have an impact on public safety if not addressed.

FIGURE 3-1:

PROJECT SCHEDULE



*Row easement to start after OPSB full application is approved.

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-04 ROUTE ALTERNATIVES ANALYSIS 2

(A) ROUTE SELECTION STUDY 2

(1) Study Area Description and Rationale 3

(2) Study Area Map 3

(3) Map of Study Area and Routes Evaluated 3

(4) Siting Criteria 3

(5) Siting Process for the Preferred Route and Alternate Route 9

(6) Route Descriptions and Rationale for Selection 10

(B) SUMMARY TABLE 12

(C) PUBLIC INVOLVEMENT 15

Table 4-1. Quantitative Siting Criteria 4-5

Table 4-2. Summary of Route Selection Factors 4-12

4906-5-04 ROUTE ALTERNATIVES ANALYSIS

SECTION SUMMARY

AEP Ohio Transmission Company, Inc. (the Company) along with its siting consultant, WSP USA ("WSP"), conducted a Route Selection Study (RSS) to identify a Preferred Route and an Alternate Route for a new 138 kV transmission line in Franklin County, Ohio (the "Groves Road – Shannon 138 kV Transmission Line Project" or "the Project"). This section summarizes the route identification, evaluation, and selection process.

(A) ROUTE SELECTION STUDY

A multi-disciplinary Siting Team, consisting of members of the Company and the Company's consultants, conducted a comprehensive RSS to establish a Preferred Route and an Alternate Route for the proposed Project. The Siting Team acquired environmental and engineering data from various sources and assembled the information into a geographic information system (GIS) database superimposed on aerial photography. Using established routing guidelines, the Siting Team identified constraints and opportunity features within the Study Area and developed a series of Study Segments. Study Segments were field checked from publicly accessible locations to validate the aerial imagery and to assess viability based on conditions observed on the ground. The Study Segments were adjusted as necessary based on information gathered in the field.

The Siting Team evaluated the advantages and disadvantages of Study Segments based on established routing and siting criteria; landowner and stakeholder input; an inventory of land use, environmental, and cultural factors on and in the vicinity of the Study Segments; and additional local knowledge and professional judgment and experience. Based on this review, less favorable potential route segments were eliminated from further consideration and more detailed analysis. The Siting Team evaluated the remaining potential route segments in more detail and selected two alternative routes to present at a public meeting for comment. Following the public input process, the Siting Team identified a Preferred Route and an Alternate Route. A copy of the RSS is provided as **Appendix 4-1**.

(1) Study Area Description and Rationale

The Study Area is that territory in which route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental and land use impacts, as well as Project costs. The boundaries of the Study Area were determined by the geographic area encompassing the two end points (the Groves Road Station to the northwest and the Shannon Station to the southeast). The Study Area was intended to encompass all reasonable study segments between these connection points.

Given these considerations, the Siting Team identified a Study Area encompassing approximately 4,903 acres (7.7 square miles) in Franklin County, Ohio (see **Figure 1** in the RSS, **Appendix 4-1**). The project Study Area is generally bounded by Interstate 70 (I-70), a railroad, and the Groves Road Station to the north; the Shannon – Astor 138 kV Transmission Line, Brice Road (County Road 117), and the Village of Brice to the east; Shannon Road (County Road 118), Winchester Pike (County Road 376), and the Shannon Station to the south; and the Bixby – Groves Road 138 kV Transmission Line, Interstate 270 (I-270), and South Hamilton Road (State Route 317) to the west. Using this established Study Area, the Siting Team began its efforts to determine potential Study Segments for the Project.

(2) Study Area Map

The proposed Study Area and identified constraints are shown in **Figure 4-1** at the end of this Section.

(3) Map of Study Area and Routes Evaluated

Figure 3 of the RSS (**Appendix 4-1**) shows all Potential Route segments that were evaluated as part of the study. **Figure 4** of the RSS identifies Alternative Routes A and B.

(4) Siting Criteria

The Siting Team referenced quantitative and qualitative siting criteria as part of the potential and alternative route analysis process. The Siting Team uses the siting criteria along with the established routing guidelines (described in Section 2.4 of the RSS, **Appendix 4-1**) to compare the

potential impacts of the routes on land use, natural and cultural resources, cost and engineering and construction concerns to identify the route with the least overall impact. The routing process is explained in more detail in Section 2.2 of the RSS. Quantitative and qualitative siting criteria are presented in Section 3.3 (also listed below in **Table 4-1**) and evaluated in Section 5.0 of the RSS.

The quantitative siting criteria include locations of individual residences, property boundaries, commercial, industrial and institutional land uses, wetlands, streams, existing infrastructure, steep slopes, cultural data, and other land use features. The qualitative siting criteria include the Siting Team's expertise regarding aesthetic and land use impacts, and engineering and constructability challenges, as well as information received through public comments.

Table 4-1. Quantitative Siting Criteria		
Siting Criteria	**Source**	**Description**
Built Environment		
Number of parcels and landowners crossed by the ROW	Franklin County (2021)	Count of the number of parcels and landowners crossed by the ROW
Number of outbuildings or residential dwellings	Microsoft "US Building Footprints" downloaded 2019 and field verified from points of public access.	Count of the number of single-family and multi-family dwellings within the ROW, within 100 and 250 feet of study segments. Features within 1,000 feet of study segments were field verified.
Number of commercial/industrial buildings	Microsoft "US Building Footprints" downloaded 2019 and field verified from points of public access.	Count of the number of commercial/industrial buildings within the ROW, within 100 and 250 feet of study segments. Features within 1,000 feet of study segments were field verified.
Land use acreage and distance crossed by the ROW	National Land Cover Database (NLCD) (2016)	The NLCD 2016 (NLCD 2016) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed	National Conservation Easement Database (NCED) (2020)	Private conservation easements crossed by the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies
Acres of agricultural district land crossed	Franklin County (2021)	Protected land that is devoted exclusively to agricultural production or devoted to and qualified for compensation under a federal land retirement or conservation program that is at least 10 acres in size, or produces an average yearly gross income of at least $2,500 during a 3-year period
Number of archeological resources within the ROW and within 0.25 mile	Ohio History Connection (2021)	Previously identified archeological resources listed or eligible on the National Register of Historic Places (NRHP) acquired through the database maintained by the Ohio History Connection, which serves as the State Historic Preservation Office

Table 4-1. Quantitative Siting Criteria		
Siting Criteria	**Source**	**Description**
Number of historic architectural resources within the ROW and within 0.25 mile	Ohio History Connection (2021)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP acquired through the database maintained by the Ohio History Connection
Institutional uses (schools, places of worship and cemeteries) within 1,000 feet of the route centerline	U.S. Geological Survey (USGS) Geographic Names Information System (GNIS) (2021)	This dataset includes the locations of cemeteries, churches, hospitals, parks, and schools. Features within 1,000 feet of study segments were field verified.
Airfield and heliports within 1 mile of the route centerline	GNIS (2021) and the Federal Aviation Administration (FAA) database (2020)	Distance from airfields and heliports
Natural Environment		
Forest clearing within the ROW	WSP	Acres of forest within the ROW observed by ecologists
Field delineated streams and waterbodies crossed	WSP	Count the number of streams and waterbodies delineated by ecologists via Trimble Global Navigation Satellite System (GNSS)
Field delineated wetlands within the ROW	WSP	Acres of wetlands delineated by ecologists via Trimble GNSS
Acres of 100-year floodplain and regulatory floodway within the ROW	National Flood Hazard Layer (NFHL) (FEMA) (2019)	Acres of FEMA-designated 100-year floodplain (Zone A) and regulatory floodway (Zone AE) within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2019)	Miles of federal, state, and local lands crossed by the ROW
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (2019)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Technical		
Route length	Measured in GIS	Length of route in miles

Table 4-1. Quantitative Siting Criteria		
Siting Criteria	**Source**	**Description**
Number and severity of angled structures	Developed in GIS	Anticipated number of angled structures 4 to 45 degrees and over 45 degrees based on preliminary design
Number of road crossings	Ohio Department of Transportation (ODOT) Transportation Information Mapping System (TIMS) (2021)	Count of federal, state and local roadway crossings
Number of pipeline crossings	U.S. Department of Transportation National Pipeline Mapping System (NPMS) (2021)	Number of known pipelines crossed by the transmission ROW
Number of transmission line crossings	AEP Ohio Transco (2017)	Number of high voltage (100 kV or greater) transmission lines crossed by the ROW
Length of transmission line parallel	AEP Ohio Transco (2017)	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	NPMS 2021	Miles of the route parallel to existing pipelines
Length of road parallel	Ohio Department of Transportation (ODOT) Transportation Information Mapping System (TIMS) (2021)	Miles of the route parallel to existing roads

Table 4-2. Qualitative Siting Criteria		
Siting Criteria	**Source**	**Description**
Built Environment		
Aesthetic impacts	Expert opinion	Anticipated visual impacts based on topography, structure type and height, tree clearing, land use and presence of existing infrastructure
Land use impacts	Expert opinion, comprehensive plans, public open house	Anticipated or perceived impact on communities and their values, individual residences, commercial facilities or institutional uses
Public comments	Public open house	Comments received during the November 2020 virtual house period, December 2021 virtual house period, and

Table 4-2. Qualitative Siting Criteria		
Siting Criteria	**Source**	**Description**
		December 15, 2021 in-person open house meeting regarding changes to transmission alignments or future constraints
Engineering and construction feasibility	Expert option	Anticipated engineering and construction challenges based on experience on similar projects

(5) Siting Process for the Preferred Route and Alternate Route

The routing process is described in detail in Section 2.2 of the RSS (**Appendix 4-1**). The Siting Team developed a series of potential route segments (also referred to as "Study Segments") based on the routing guidelines and criteria described previously. Study Segments are an early iteration of the routing process that involved the development of conceptually based routes that attempts to avoid large area constraints to the extent practicable, avoid and maximize distance from small area constraints, and capitalize on identified routing opportunities. Constraints and opportunities are described in Section 3.3 of the RSS.

The Preferred and Alternate Route identification effort started with a network of 35 preliminary route segments that could be considered to route the new line between the existing Groves Road Station and the existing Shannon Station. After reviewing and evaluating public input received during the November 2020 virtual open house, the Siting Team revised the preliminary network appropriately, which resulted in a total of 31 revised potential route segments. The Siting Team discussed these Study Segments by reviewing comparative data, aerial photos, notes taken during field reconnaissance (conducted in August 2020), as well as virtual open house comments received in November 2020.

The major environmental and land use factors considered in this evaluation were: length of new ROW required, length of transmission line parallel, length of transmission line rebuild, length of infrastructure parallel, proximity of residences and other occupied buildings, proximity to open spaces and/or recreational areas, known or suspected historic sites, incremental aesthetic impact, wetlands and other stream crossings, tree clearing requirements, and unique or sensitive habitat. Engineering factors were also considered during the study segment evaluation, including reviewing areas that presented engineering and construction challenges (e.g., the number of angle structures required and the need to route through developed or otherwise difficult areas). Based on the Siting Team review, some segments were revised, removed, or added based on the likelihood of impacts on residential, commercial and industrial areas, agricultural areas, planned and future development and natural areas, as well as consideration of the routing guidelines and criteria.

Route Alternative Development

Once the revised Study Segment Network was developed, a qualitative and quantitative screening process was used to eliminate or modify Study Segments that were not considered suitable for additional review, narrowing down the network and focusing on refining the more preferable segments to establish Route Alternatives. Several segments were eliminated to avoid encroachment of the built environment, including residential and commercial/industrial dwellings, as well as open space and/or recreational areas. Based on stakeholder input and landowner feedback from a virtual open house held between November 16 and December 4, 2020, a few segments were revised and rerouted to avoid City of Columbus parks and/or protected areas. The Siting Team developed two Route Alternatives (Routes A and B) from the remaining segments. The Route Alternatives were presented for comment at an in-person open house on December 15, 2021, as well as a virtual open house, held online through December 15 to December 20, 2021. The public outreach process is discussed below in Section C and detailed in Section 6 of this Application.

Following the open houses, the Siting Team reviewed all comments received from public outreach and completed the qualitative and quantitative analysis of the Route Alternatives in order to select a Preferred Route and Alternate Route. The Siting Team selected Route A as the Preferred Route and Route B as the Alternate Route.

(6) Route Descriptions and Rationale for Selection

Route A (Preferred Route)

Route A, the northernmost Route Alternative, is approximately 6.6 miles long and located within Madison and Truro townships in Franklin County, Ohio. Route A begins at the Groves Road Station and heads eastward by rebuilding approximately 0.7 mile of the existing Refugee – Groves Road 138 kV transmission line in existing ROW before crossing OH-317 and routing northward for 0.6-mile, paralleling Groves Road and Cloverleaf Street. At this point, Route A travels in a general southeastward direction for approximately 2.3 miles by paralleling the northside of a railroad corridor. For its remaining approximately 3 miles, Route A travels southward by primarily rebuilding the existing Shannon – Astor 138 kV transmission line, from single circuit to double

circuit, in existing, maintained ROW for tie-in to Shannon Station, apart from a 0.4 mile greenfield re-route portion, which parallels road and parcel boundaries. Route A would require 26.1 acres of new ROW and would use approximately 21.3 acres of existing, maintained 138 kV transmission line ROW.

Route B (Alternate Route)

Route Alternative B is the southwestern and shortest routing option, measuring approximately 5.2 miles. Route B begins at Groves Road Station and routes southward by rebuilding the existing Refugee – Groves Road 138 kV transmission line for 0.2 mile. Then, Route B continues further southward for approximately 1.9 miles by paralleling the westside of the existing Bixby – Groves Road 138 kV transmission line within an existing, unmaintained ROW. At this point, Route B heads southeastward primarily by paralleling Winchester Pike and Shannon Road for approximately three miles, crossing the roads to avoid encroaching residential or commercial properties. The remaining 0.1 mile of Route B proposes rebuild of the existing Astor-Shannon 138 kV transmission line for tie-in to Shannon Station. Route B would require approximately 21.3 acres of new ROW and would use approximately 14.8 acres of an existing AEP 200-foot-wide easement.

Description of Route Alternatives Evaluation

Section 5.0 of the RSS provides a quantitative and qualitative analysis of potential impacts to the natural and built environment as well as potential engineering and constructability challenges. The Route Alternatives were reviewed in detail and compared using a combination of information collected in the field, GIS data sources, public input, supporting documents, and the collective knowledge and experience of the Siting Team.

While the Preferred Route and Alternate Route are both constructible, Route A was selected as the Preferred Route primarily because it minimizes impacts to the built and natural environment by rebuilding existing 138 kV transmission line within maintained utility ROW in addition to paralleling existing transportation corridors for the majority of its route. Rebuilding existing 138 kV transmission line within maintained ROW and paralleling existing linear infrastructure will result in fewer changes to the existing landscape and land use, fewer acres of tree clearing, and

will provide opportunities to use existing access associated with the Shannon – Astor and Groves Road – Refugee 138 kV transmission lines. Approximately 3 miles of the existing Shannon-Astor 138 kV Transmission Line is proposed to be rebuilt as part of the Preferred Route. If the Alternate Route is selected, this section of transmission line would still be required to be rebuilt as part of the overall Southeast Columbus Area Improvements Project.

(B) SUMMARY TABLE

Table 4-2, as well as Tables 1 through 4 of the RSS (**Appendix 4-1**), provide a comparison of the Route Alternatives.

Table 4-2. Summary of Route Selection Factors

Factor	Alternative Route A (Preferred Route)	Alternative Route B (Alternate Route)
Natural Environment		
Hydrology		
Total Field Delineated Stream Crossings (#)	7	4
Big Walnut Creek	1	1
Blacklick Creek	1	1
Mason Run	0	1
UNT to Big Walnut Creek	1	0
UNT to Blacklick Creek	4	0
UNT to Mason Run	0	1
Field Delineated Waterbody Crossings (#)	1	1
Total Field Delineated Wetlands in the ROW (acres)	0.6	1.02
PEM	0.3	0.8
PSS	0	0.02
PFO	0.3	0.2
FEMA 100-Year Floodplain in the ROW (acres)	4.8	7.7
FEMA Regulatory Floodway in the ROW (acres)	4.9	4.0
Forest Clearing (acres)		
Forest Clearing required for the ROW (based on field survey observation)	11.2	2.8
Open Space/Conservation		
Protected Lands (acres)	0	0
City of Columbus Parks crossed by ROW (count)	1	0

Table 4-2. Summary of Route Selection Factors		
Factor	**Alternative Route A (Preferred Route)**	**Alternative Route B (Alternate Route)**
City of Columbus Parks within 500 feet of the centerline (count)	5	6
Prime Farmland Soils in the ROW (percent)		
All Areas are Prime Farmland	25.2%	41.9%
Not Prime Farmland	11.6%	11.9%
Prime Farmland if Drained	63.2%	46.2%
Built Environment		
Human Environment (count)		
Barns, Outbuildings, Sheds, Garages, or Silos in the ROW (excludes abandoned features)	2	0
Single-Family Dwellings within the ROW	0	0
Multi-Family Dwellings within the ROW	0	0
Commercial/Industrial Buildings within the ROW	1	0
Single-Family Dwellings within 100 feet of the Centerline	44	6
Multi-Family Dwellings within 100 feet of the Centerline	10	0
Single-Family Dwellings within 250 feet of the Centerline	240	133
Multi-Family Dwellings within 250 feet of the Centerline	31	43
Commercial/Industrial Buildings within 250 feet of the Centerline	50	18
Schools within 500 feet of the Centerline	1	0
Places of Worship within 500 feet of the Centerline	5	3
Cemeteries within 500 feet of the Centerline	0	1
Municipal or Recreational Facilities within 500 feet of the Centerline	1	1
Parcels Crossed by the ROW	123	54
Landowners Crossed by the ROW	86	40
Cultural Resources		
Known[1] Architectural Sites within the ROW	0	0
NRHP-Eligible Architectural Sites within ROW	0	0

[1] known architectural and archaeological sites do not have a designated status and therefore could not be dismissed at this time, as potentially NRHP-eligible.

Table 4-2. Summary of Route Selection Factors		
Factor	**Alternative Route A (Preferred Route)**	**Alternative Route B (Alternate Route)**
Known* Architectural Sites within 0.25 mile of the Centerline	14	7
NRHP-Eligible Architectural Sites within 0.25 mile of Centerline	0	1
Known* Architectural Sites within one mile of the Centerline	38	27
NRHP-Eligible Architectural Sites within one mile of Centerline	0	1
Known Archaeological Resources within ROW	0	3
Known Archaeological Resources within 0.25 mile of the Centerline	4	36
Agriculture and Forestry Resources [2]		
Pasture/rangeland and cropland in the ROW (based on NCLD data)	7.9	3.6
Forested land cover in the ROW (based on field survey observation)	11.2	2.8
Agricultural Easement and Districts		
Security Areas (miles)	0	0
Easements (miles)	0	0
Agricultural Districts (miles)	0	0
ROW and Constructability		
Length (Miles)	6.6	5.2
Acres of ROW Required (60' corridor)	48.3	37.5
Landowners within ROW	86	40
Angled Structures (count)		
Angle Structures 4-45 degrees	10	17
Angle Structures ≥ 45 degrees	26	10
Total Angle Structures	36	27
Infrastructure Crossed (count)		
Interstates	1	1
U.S. Highways	0	0
State Routes	1	1
Local Roads	11	11
Railroad	2	0

[2] Agricultural land use calculations are based on the 2016 National Land Cover Database (NLCD). NLCD is a 16-class land cover classification that has been applied consistently across the conterminous United States at a spatial resolution of 30 meters. NLCD is an industry standard, but due to its large resolution it should be used as a rough approximation of land use.

Table 4-2. Summary of Route Selection Factors		
Factor	**Alternative Route A (Preferred Route)**	**Alternative Route B (Alternate Route)**
HV Transmission ROW	0	2
Rights-of-Way Parallel (miles)		
138 kV Transmission Parallel (within existing unmaintained ROW)	0	1.9
138 kV Transmission Rebuild (within existing maintained ROW)	3.1	0.3
Road Parallel	0.7	2.7
Railroad Parallel	2.3	0
Parcel Boundary Parallel	0.3	0
Total Percent Parallel	96%	96%

(C) PUBLIC INVOLVEMENT

Public involvement began with a virtual open house period, announcing the 35 preliminary Study Segments, which took place between November 16 and December 4, 2020. After the public's commentary, the preliminary Study Segments were reviewed and evaluated. A resulting network of 33 revised Study Segments were developed into two Route Alternatives. On December 15, 2021, the Company held a public open house at the Wigwam Event Center in Pickerington, Ohio to present the two Route Alternatives and provide information about the Project. Prior to the meeting, the Company mailed public notices to property owners within the Route Alternatives' ROW and property owners adjacent to properties within the Route Alternatives' ROW to notify them of the in-person open house meeting. During this same time period, the Company developed a Project website and virtual open house in order to provide information to those unable to attend the in person open house. Information presented at the virtual open house included the project need, the siting process, and the two Route Alternatives for public comment.

At the December 15, 2021 meeting, attendees received a project factsheet, information on the OPSB process, and comment cards. The meeting provided an opportunity for residents and other interested parties to review project information displays and discuss the Project with the Company and the Company's consultant representatives. The factsheet contained a brief statement on project need and benefits, a description of the siting process, information about easements and permitting,

and a preliminary project timeline. The public meeting was organized in an open house format and consisted of several stations that identified the Project processes. These stations included the following:

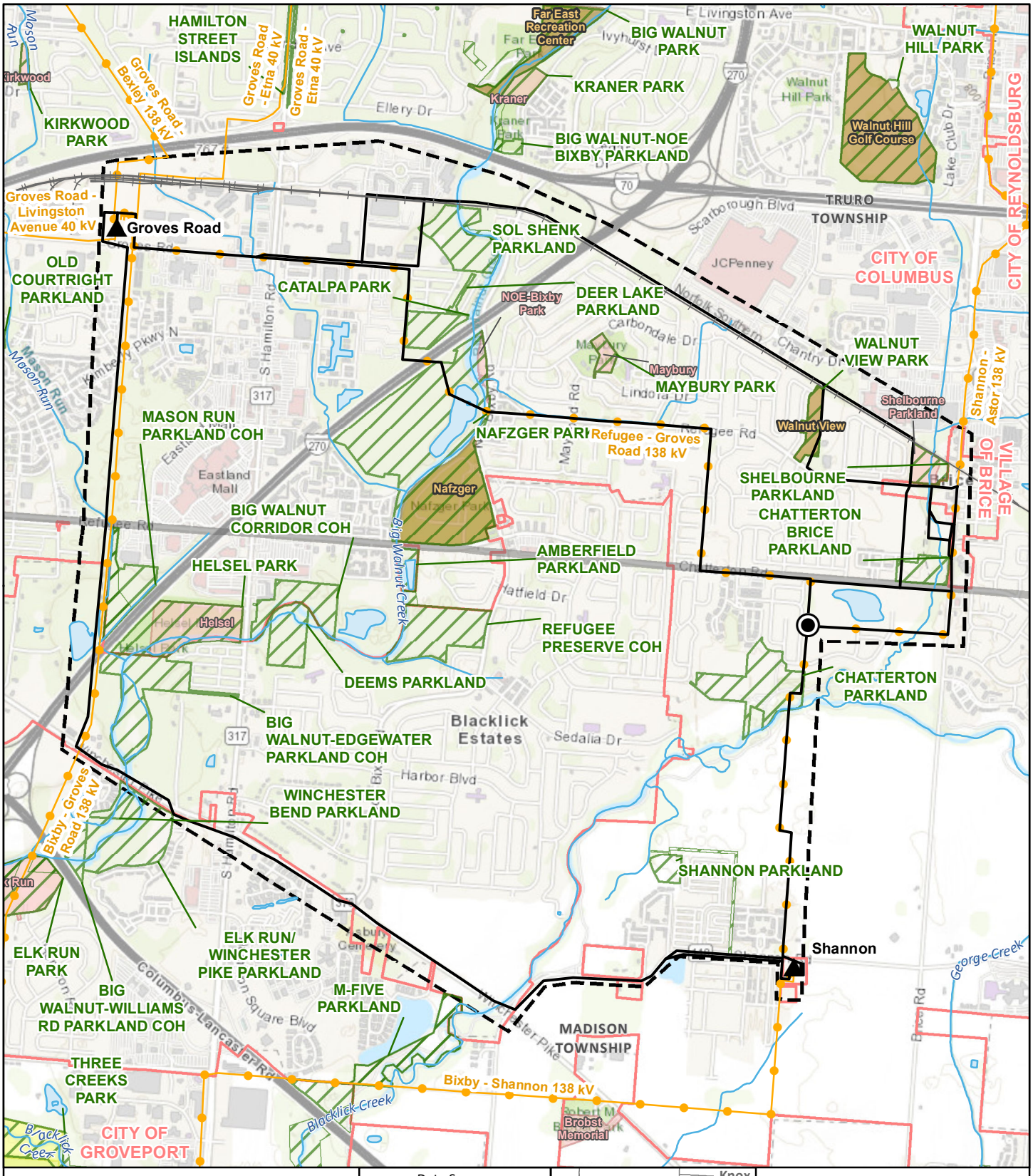
1. Welcome station located at the entrance for attendees to sign-in.
2. Project Need station, which provided an overall summary and explained the planning process.
3. Engineering station, which detailed the specifications for the new transmission line and construction requirements.
4. Siting and Environmental station, which detailed the siting process and included aerial maps showing the Preferred Route and parcel boundaries.
5. Right-of-Way station, which explained the easement process.
6. Vegetation Management station, which explained the Company's vegetation management protocol.

The virtual house was set up similarly to the in-person open house, with virtual "stations" and information related to engineering and design of the structures, the Project need, real estate and ROW issues, and the siting process. An interactive map was provided at the virtual open house for the public to review. At both the in-person and virtual open houses, participants were encouraged to document the location of their houses, places of business, properties of concern, or other sensitive resources either on comment cards or maps provided.

Five participants attended the in-person open house and three comment cards were completed. Five additional comments were received after the in-person open house, either via email or telephone. No significant opposition to any Route Alternative was expressed during the public meeting. The Company reviewed these comments and followed up with the commenters as appropriate to answer any outstanding questions. In addition, the Company provided the commenters with the Project website and a phone number to obtain additional information about the Project or to provide further comments.

FIGURES


KIRKWOOD PARK
HAMILTON STREET ISLANDS
HAMILTON STREET ISLANDS
SHADY CT STREET ISLAND
Far East Recreation Center
BIG WALNUT PARK
KRANER PARK
BIG WALNUT PARK
WALNUT HILL PARK
Walnut Hill Golf Course
REYNOLDSBURG
COLUMBUS
Kirkwood
Groves Road - Bexley 138 kV
Groves Road - Etna 40 kV
Groves Road - Livingston Avenue 40 kV
Kraner
SOL SHENK PARKLAND
BIG WALNUT-NOE BIXBY PARKLAND
Groves Road
CATALPA PARK
NOE-Bixby Park
MAYBURY PARK
Maybury
WALNUT VIEW PARK
Refugee - Groves Road 138 kV
Shelbourne Parkland
Walnut View
NAFZGER PARK
SHELBOURNE PARKLAND
AMBERFIELD PARKLAND
Nafzger
BRICE
COLUMBUS
CHATTERTON BRICE PARKLAND
MASON RUN PARKLAND COH
DEEMS PARKLAND
Bixby - Groves Road 138 kV
CHATTERTON PARKLAND
Shannon - Astor 138 kV
Helsel
COLUMBUS
HELSEL PARK
BIG WALNUT CORRIDOR COH
REFUGEE PRESERVE COH
BLACKLICK ESTATES
WINCHESTER BEND PARKLAND
ELK RUN/ WINCHESTER PIKE PARKLAND
SHANNON PARKLAND
ELK RUN PARK
BLACKLICK ESTATES
COLUMBUS
Ik Run
BIG WALNUT-WILLIAMS RD PARKLAND COH
Shannon
M-FIVE PARKLAND
COLUMBUS
GROVEPORT
Bixby - Shannon 138 kV
Brobst Memorial
THREE CREEKS PARK
Existing Station
Refugee Switch (to be removed)
Cemetery
Place of Worship
School
Existing Transmission Line
69 kV and below
138 kV
Study Area
Protected Areas - Ownership Type
Local Government
Private Land
Regional Agency Special District
City of Columbus Park or Easement Boundary
Municipal Boundary
Data Sources: AEP (2017), ESRI (2021), NAIP (2021), ODOT (2021), USGS (2013, 2021)
Coordinate System: State Plane Ohio South NAD 1983
March 3, 2022
Union
Delaware
Knox
Licking
Madison
Franklin
Perry
Fairfield
Fayette
Pickaway
Hocking
Figure 4-1
Constraint Map
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon
138 kV Transmission Line
0
0.25
0.5
Miles
N



Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), USGS (2013, 2021)

Coordinate System:
State Plane Ohio South
NAD 1983

March 3, 2022

Figure 4-2
Potential Route Network

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon
138 kV Transmission Line

APPENDIX 4-1:

ROUTE SELECTION STUDY

Route Selection Study

Groves Road – Shannon 138 kV Transmission Line Project

Prepared for:

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY™

Submitted to:

American Electric Power

Prepared by:

WSP USA
312 Elm Street
Suite 2500
Cincinnati, OH 45202

March 2022

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Project Description 1
1.2 Proposed Transmission Facilities Description 2
1.3 Proposed Construction Activities 4
1.4 Project Timeline and Overview of Regulatory Approvals 5
1.5 Goal of the Route Selection Study 6

2.0 ROUTE AND SITE DEVELOPMENT PROCESS 7
2.1 Siting Team 7
2.2 Route Development Process Overview 7
2.3 Data Collection 9
2.3.1 Geographic Information System (GIS) Data Collection 10
2.3.2 Federal, State and Local Government Coordination 10
2.3.3 Field Reconnaissance 11
2.3.4 Public and Stakeholder Input 11
2.4 Siting Guidelines 12
2.4.1 General Guidelines 12
2.4.2 Technical Guidelines 14

3.0 ROUTE ALTERNATIVE IDENTIFICATION 16
3.1 Project Endpoints 16
3.2 Study Area Description 16
3.3 Constraints and Opportunity Features 18
3.4 Routing Concepts 20
3.5 Study Segment Development 21
3.6 Public Involvement Process 22
3.6.1 Public Communications and Open House 22
3.6.2 Project Website and Virtual Open House 23
3.6.3 Consideration of Public and Stakeholder Input 23
3.7 Study Segment Evaluation and Refinement 23

4.0 Route Alternatives 27
4.1.1 Route Alternative A 27
4.1.2 Route Alternative B 28
5.0 ROUTE ALTERNATIVE COMPARISON 29
5.1 Natural Resources 29
5.1.1 Geological, Soil, and Water Resources 29
5.1.2 Wildlife Habitat and Sensitive Species 32
5.2 Human Environment 36
5.2.1 Existing and Proposed Developed Land Use 36
5.2.2 Agricultural and Forestry Resources 41
5.2.3 Aesthetic Impacts to Recreation and Conservation Lands 42
5.2.4 Historic and Archaeological Resources 45
5.2 Constructability 47
5.2.1 Engineering 47
5.2.2 Topographic and Geotechnical 51
5.2.3 Access Roads 52
5.2.4 Right-of-Way 52
5.2.5 Operation, Maintenance, and System Considerations 53
6.0 IDENTIFICATION OF THE PREFERRED AND ALTERNATE ROUTE 55

Tables

Table 1. Natural Resource Evaluation Criteria 35
Table 2. Land Use Evaluation Criteria 40
Table 3. Archaeological Resources within 1 mile 46
Table 4. Constructability Evaluation Criteria 51

Figures

Figure 1. Project Location Map 2
Figure 2a. Typical Single Circuit Transmission Structure 3
Figure 2b. Typical Double Circuit Transmission Structure 4
Figure 3. Typical Transmission Line Construction Activities 5
Figure 4. Route Development Process Steps 9
Figure 5a. Northern Study Segments 25
Figure 5b. Southern Study Segments 26

Attachments

Attachment A: Maps
- Map 1. Study Area
- Map 2. Conceptual Routes
- Map 3. Study Segment Network
- Map 4. Route Alternatives
- Map 5. Natural Resources
- Map 6. Land Use
- Map 7. Cultural Resources
- Map 8. Preferred Route

Attachment B: GIS Data Sources
Attachment C: Agency Correspondence

Key Terminology

Conceptual Routes	Initial routes for the Project that adhere to a series of general siting and technical guidelines
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process
Distribution Line	An electric line that delivers power from a station to households and businesses
Opportunity Feature	Areas where the transmission line may have less disruption to area land uses and the natural and cultural environment
Project Endpoint	The Project starting and ending point(s), which may include stations, switch stations, tap points, or other locations defined by the Company's planners and engineers
Preferred Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Preferred Route (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a timely, safe and reliable manner.
Route Alternatives	Assemblage of Study Segments that form routes for analysis and comparison
Siting Team	A multidisciplinary team of experts in transmission line routing, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management
Study Area	The territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental impacts and Project costs
Study Segments	Study Segments are partial alignments that when combined form a complete route
Station	Stations are facilities that transform electric power from high to low, or the reverse an enclosed assemblage of equipment, e.g., switches, circuit breakers, buses, and transformers, through which electric energy is passed for the purpose of switching or modifying its characteristics

Switch Structure	The location where power is switched from an existing transmission line to source a Station or customer
Transmission Line	An electric line that moves bulk electric power from a generating plant to a Station or between Stations

ACRONYMS

AEP	American Electric Power
EHV	Extra-high voltage
EPA	U.S. Environmental Protection Agency
ESC	Environmental Survey Corridor
ESRI	Environmental Systems Research Institute
DBH	Diameter at breast height
GIS	Geographic information system
GPS	Global positioning system
HV	High-voltage
kV	Kilovolt
msl	Mean sea level
NAIP	National Agricultural Imagery Project
NERC	North American Electric Reliability Corporation
NCED	National Conservation Easement Database
NGOs	Non-Government Organizations
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service of the U.S. Department of Agriculture
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ODNR	Ohio Department of Natural Resources
PADUS	Protected Areas Database of the United States
ROW	Right-of-way
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic Database
T&E	Threatened and endangered (species)
UNT	Unnamed tributary
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

1.1 Project Description

American Electric Power Ohio Transmission Company ("AEP Ohio Transco" or the "Company") plans to upgrade the electric transmission network servicing customers in southeast Columbus and Groveport (the Southeast Columbus Area Improvements Project), Franklin County, Ohio. The Southeast Columbus Area Improvements Project involves:

- Building approximately 5 miles of 138-kilovolt (kV) transmission line between Groves Road and Shannon Stations in Truro and Madison Townships, Franklin County, Ohio.
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Astor and Shannon Stations in Truro and Madison Townships, Franklin County, Ohio.
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Bixby and Shannon stations in Madison Township, Franklin County, Ohio.
- Expanding Shannon Station near the intersection of Shannon Road and Brice Road.

WSP was retained by AEP Ohio Transco to conduct a comprehensive Route Selection Study ("RSS") to identify a Preferred and Alternate Route[1] for the Groves Road – Shannon 138 kV Transmission Line portion of the Southeast Columbus Area Improvements Project (herein known as the "Groves Road – Shannon 138 kV Transmission Line Project or the Project). The remaining components of the Southeast Columbus Area Improvements Project are not detailed in this study. The WSP Siting Team evaluated the Route Alternatives based on established siting guidelines (see **Section 2.3**); an inventory of environmental, land use, and cultural factors along each of the routes; and additional local knowledge, including stakeholder input and professional experience. Through this process, some study segments were eliminated. The remaining study segments were assembled into Route Alternatives and retained for further consideration. As shown in **Figure 1**, the Project is located within Madison and Truro townships, Franklin County, Ohio. The proposed right-of-way (ROW) width for the Project is 60 feet.

The Project is located approximately six miles southeast of downtown Columbus, Ohio. The Project Area is within the incorporated limits of the City of Columbus, the Census Designated Place ("CDP") of Blacklick Estates, and the Village of Brice. Other nearby incorporated municipalities include the City of Groveport and the Village of Obetz to the southwest. The

[1] Due to state [Ohio Power Siting Board (OPSB)] application requirements, the goal of this RSS is to identify a Preferred and Alternate Route for the Project.

straight-line distance between the Groves Road and Shannon stations is approximately 3.7 miles. Land use in the area is predominantly composed of mixed-use residential and commercial/industrial developed, with smaller amounts of agricultural land and open space recreation areas. Existing developed land was identified as a significant constraint when determining Route Alternatives for the Project.

Siting opportunities within the Project area were limited to paralleling transportation corridors (including major roads and railroad), paralleling or crossing agricultural property boundaries, and paralleling an existing transmission line. The main siting challenges include the densely populated residential areas, mixed-use commercial/industrial areas, highways, recreational areas, as well as Big Walnut Creek, Blacklick Creek and their associated forested riparian corridors and floodplain. **Figure 1**, shown below, displays the Project's endpoints, municipal areas, and existing infrastructure.

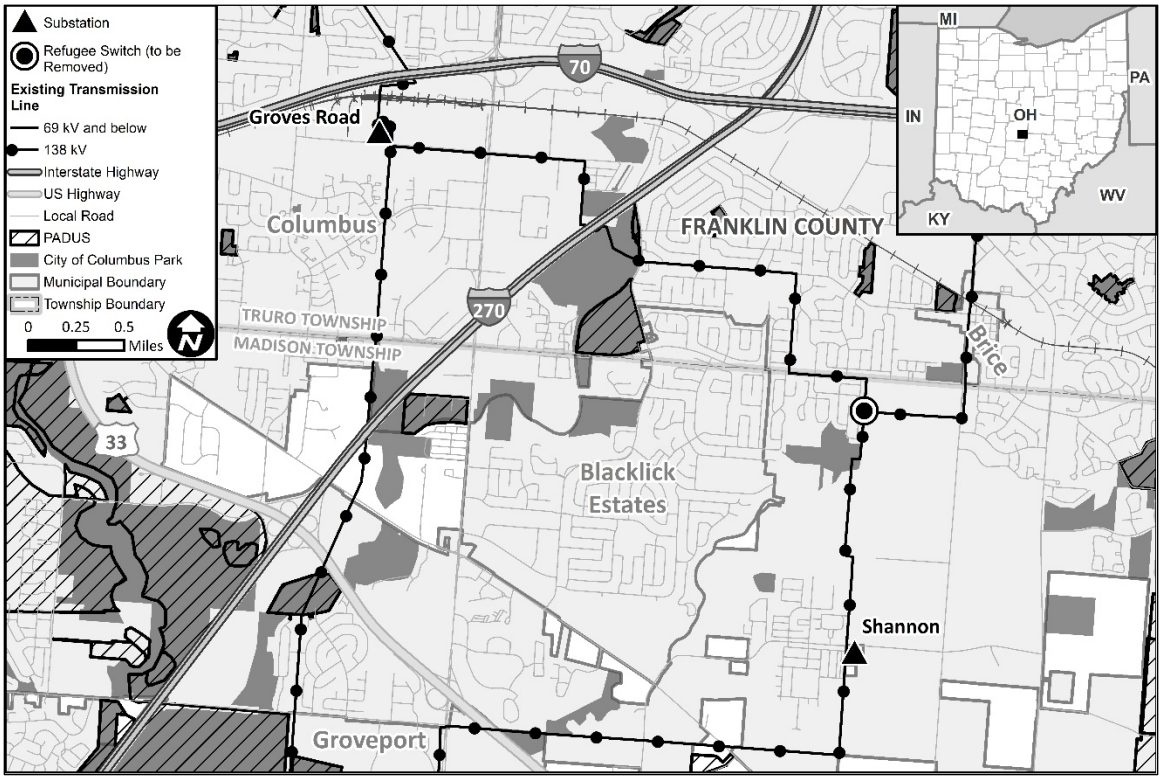


Figure 1. Project Location Map

1.2 Proposed Transmission Facilities Description

The Company proposes to retire approximately 3.2 miles of the existing Refugee – Groves Road 138 kV transmission line and construct approximately five miles of new 138 kV transmission line between their existing Groves Road and Shannon stations (the "Project Endpoints", see **Section**

3.1) within Madison and Truro townships, Franklin County, Ohio. The Project will consist of a single-circuit 138 kV transmission line, with the potential of up to approximately three miles of double-circuit 138 kV transmission line, where one of the Route Alternatives considers rebuilding part of the existing Shannon – Astor 138 kV transmission line.

The majority of proposed structures are expected to be single circuit steel monopoles (**Figure 2a**). The remaining proposed structures will consist of double circuit steel monopoles (**Figure 2b**). The proposed monopoles will average approximately 90 feet in height. Steel monopoles have a smaller footprint and were chosen due to the predominantly developed residential and mixed commercial/industrial land use of the surrounding area.

The Project is a mix of greenfield 138 kV transmission line within a new 60-foot-wide right-of-way (ROW) and rebuilding within an existing 138 kV transmission line ROW. The proposed access routes will be temporary except in key areas where long-term maintenance access is required.

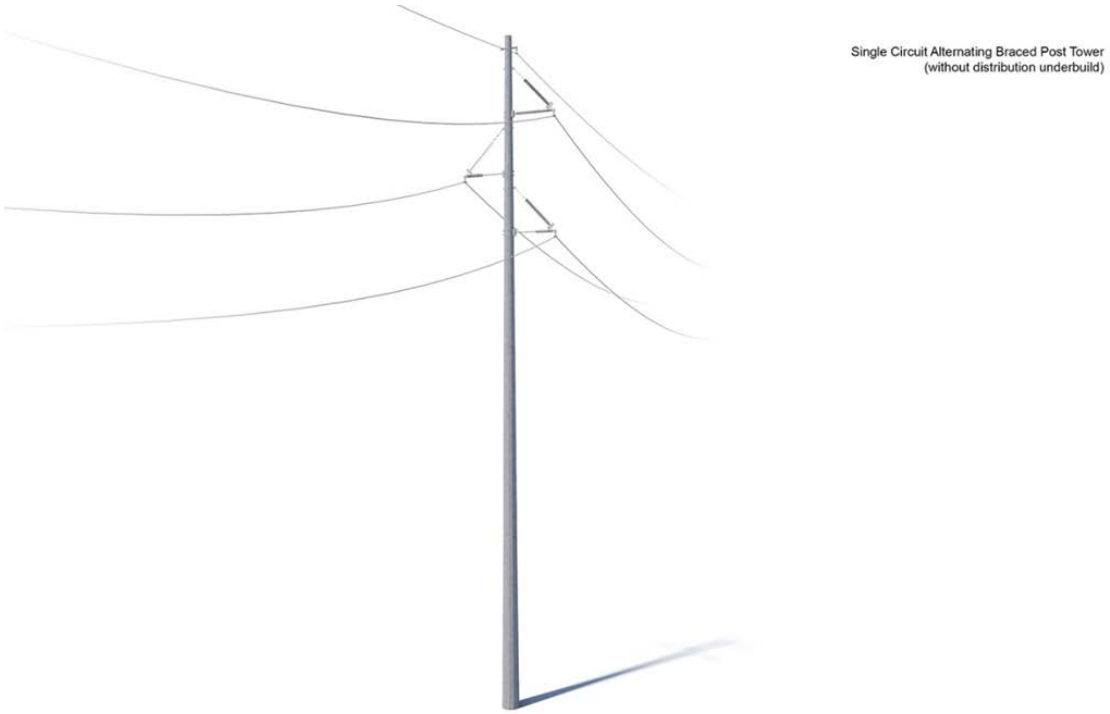


Figure 2a. Typical Single Circuit Transmission Structure

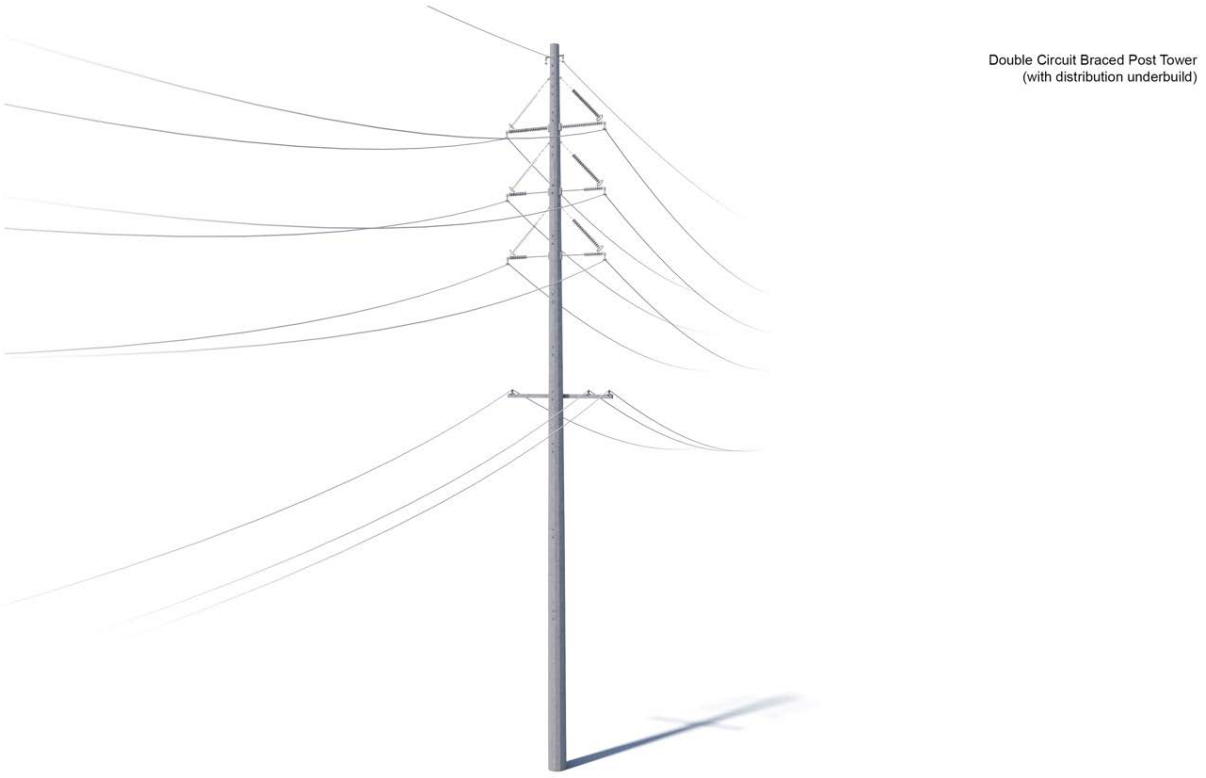


Figure 3b. Typical Double Circuit Transmission Structure

1.3 Proposed Construction Activities

Transmission construction is complex, but typically follows a regular progression of activities. Once a final route is identified, a series of field surveys and construction planning efforts begin. Initial field surveys are conducted to locate site-specific environmental features along the route in support of environmental permitting requirements, geotechnical investigations, and access road planning. Typical follow-on construction activities include ROW clearing, erosion and sediment controls installation, temporary access road construction, crane pad grading, foundation installation, structure assembly and erection, conductor and shield wire installation, and restoration following completion. All of these activities can create temporary inconvenience such as traffic delays and detours, potentially brief electrical outages to customers, increased heavy equipment traffic, dust, and noise. See **Figure 3**.

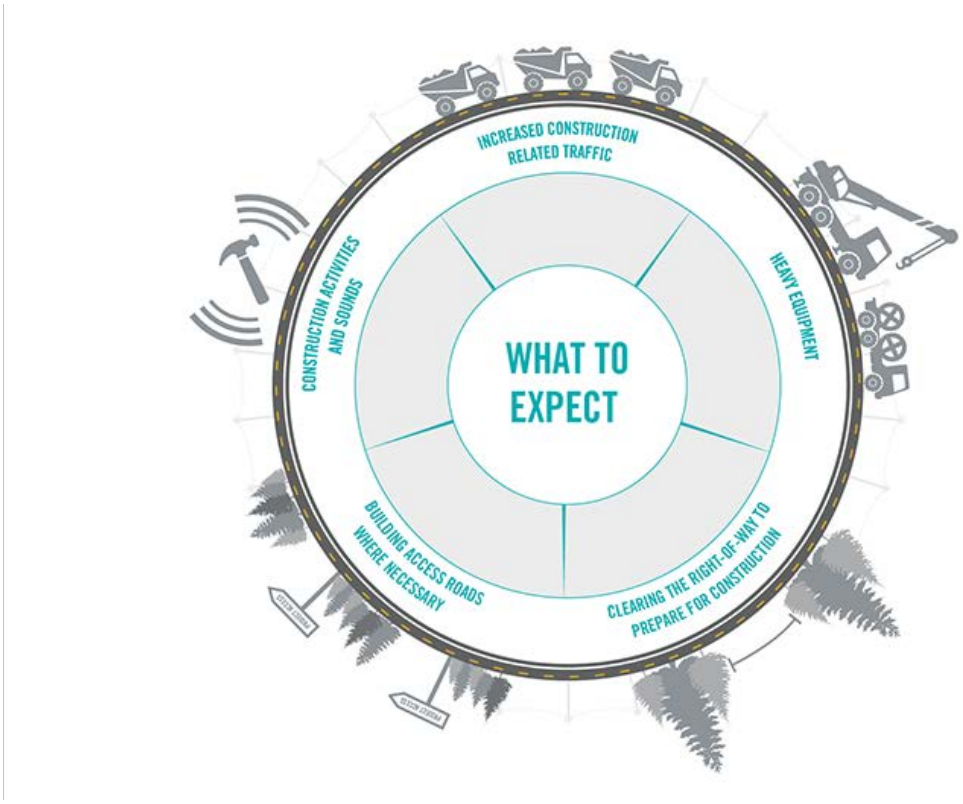


Figure 4. Typical Transmission Line Construction Activities

The Company will make every effort during construction to be respectful of the environment and existing land use. Activities will be conducted in accordance with applicable federal, state, and/or local requirements. After construction, general maintenance activities include periodic ROW vegetation management and inspections to ensure the safe and reliable operation of the transmission line.

1.4 Project Timeline and Overview of Regulatory Approvals

General Timeline – AEP Ohio Transco began the transmission siting process by developing Study Segments between late 2019 to early 2020. In October 2020, the Company began the process of introducing the Project to local and state agencies and stakeholders. Following the discussion with local and state agencies as well as other stakeholders, the Study Segments were presented to the public in November 2020. After the public open house, the Study Segments were re-evaluated and revised based on public input and compiled into Route Alternatives in early 2021. An environmental field survey was conducted on the Route Alternatives in summer of 2021 to identify ecological constraints, such as wetlands, streams, or threatened or endangered species

habitat[2]. A second public open house was conducted in December 2021. Following the open house, public comments were evaluated, and a Preferred and Alternate Route for the Project was selected in January 2022. AEP Ohio Transco engineers completed final design of the Preferred Route, as well as provided a design for the Alternate Route in January 2022. AEP Ohio Transco real estate representatives anticipate property owner negotiations for new ROW easements following the Ohio Power Siting Board's ("OPSB") decision on the Project, which is anticipated in the fourth quarter of 2022. Permitting is anticipated to take place in early spring 2022 and into the fall of 2022. Construction is expected to begin in October 2023 to meet a November 2024 in-service date.

Regulatory requirements – The Project requires a Full Standard Application (4906-5) to be filed with the OPSB, as it proposes new construction and relocation of single or multiple circuit electric power transmission lines greater than two miles in length.

Storm Water Pollution Prevention Plan ("SWP3") and Erosion and sediment control plans will be prepared in accordance with the Ohio Environmental Protection Agency ("OEPA") Permit No. OHC000005 and the City of Columbus MS4 Stormwater Drainage Manual. OEPA approval of such plans typically take up to one month.

A wetland and water resource delineation was previously conducted along the ROW of the Route Alternatives to identify wetlands or other Waters of the U.S. and streams designated as "eligible" for the OEPA Section 401 Water Quality Certification ("WQC") for the United States Army Corps of Engineers ("USACE") 2017 Nationwide Permits ("NWPs").

1.5 Goal of the Route Selection Study

The goal of the Groves Road – Shannon 138 kV Transmission Line Project Route Selection Study is to gain an understanding of the constraints and opportunity features in the study area to facilitate the development of study segments, evaluate potential impacts associated with the study segments, and identify a Preferred and Alternate Route. The Preferred Route is the route that (1) is most consistent with the siting guidelines (see **Section 2.4**); (2) reasonably minimizes adverse impacts on the natural and human environments; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner. **Section 2.0** describes the route development process to meet the goal of the RSS.

[2] Additional delineated resources were previously identified in the Project Area in January and February 2020, for areas that coincide with the Shannon – Astor, Refugee – Groves Road, and Bixby – Shannon portions of the overall Southeast Columbus Area Improvements Project.

2.0 ROUTE AND SITE DEVELOPMENT PROCESS

2.1 Siting Team

A multi-disciplinary Siting Team performed the Route Selection Study. Team members were selected to bring a variety of experiences to the RSS to achieve a thorough review of aspects of developing the route. Members of the Siting Team have experience in transmission line siting, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management.

The Siting Team developed siting criteria, identified siting constraints and opportunity features, collected and analyzed environmental and design data, solicited stakeholder input and coordinated with resource and permitting agencies. The Siting Team then used that information to develop and revise study segments and route alternatives, analyze the route alternatives, and report on the selection of a Preferred Route. This report documents the Siting Team's process that lead to identification of the Preferred Route and Alternate Route for the Groves Road – Shannon 138 kV Transmission Line Project.

2.2 Route Development Process Overview

Route development is an iterative process, sometimes with frequent modifications as new information is identified and developed from agencies, landowners, residents, and other stakeholders, and routes are reassessed. The Siting Team uses specific vocabulary to describe the routes at different stages of development. The following provides an overview of the route development nomenclature.

Generally, the purpose of routing is to identify viable initial options, review, and refine those many options down to fewer and more appropriate options based on the siting criteria and Project scope, and to ultimately select one as the preferred route. The detailed steps for achieving this are presented below:

Initial route development starts with identification of **Project Endpoints.** Endpoints typically include stations, switch stations, tap points, or other locations defined by AEP's planners and engineers. Next, **Constraints and Opportunity Features** are identified and mapped within the **Study Area**, a defined region that includes the Project Endpoints and area between **(Figure 4, Step 1)**. Constraints and opportunities are typically identified using readily available public data sources and supplemented with stakeholder input and field review.

Once the Project Endpoints, Study Area and Constraints and Opportunity Features are identified, the **Siting Team** then develops **Conceptual Routes** for the Project, using a series of general siting and technical guidelines **(Step 2)**. Where two or more of these Conceptual Routes intersect,

Study Segments are formed between two common points of intersection. Collectively, the Study Segments are referred to as the **Study Segment Network (Step 3)**.

New information is constantly developed and evaluated by the Siting Team, such as public and stakeholder input and field inspections. Where necessary, the Study Segment Network is modified to develop a **Refined Study Segment Network (Step 4)**. **Route Alternatives** are then developed by assembling the Refined Study Segments that reasonably meet the **Siting Guidelines (see Section 2.4)** into individual routes for analysis **(Step 5)**. Route Alternatives are compared according to their relative merits and potential effects on natural and cultural resources, land use, and constructability. Ultimately, through a quantitative and qualitative analysis and comparison of the Route Alternatives, the Siting Team identifies a **Preferred Route (Step 6),** which is the most suitable route that meets the goal of the Routing Study (see **Section 1.5**).

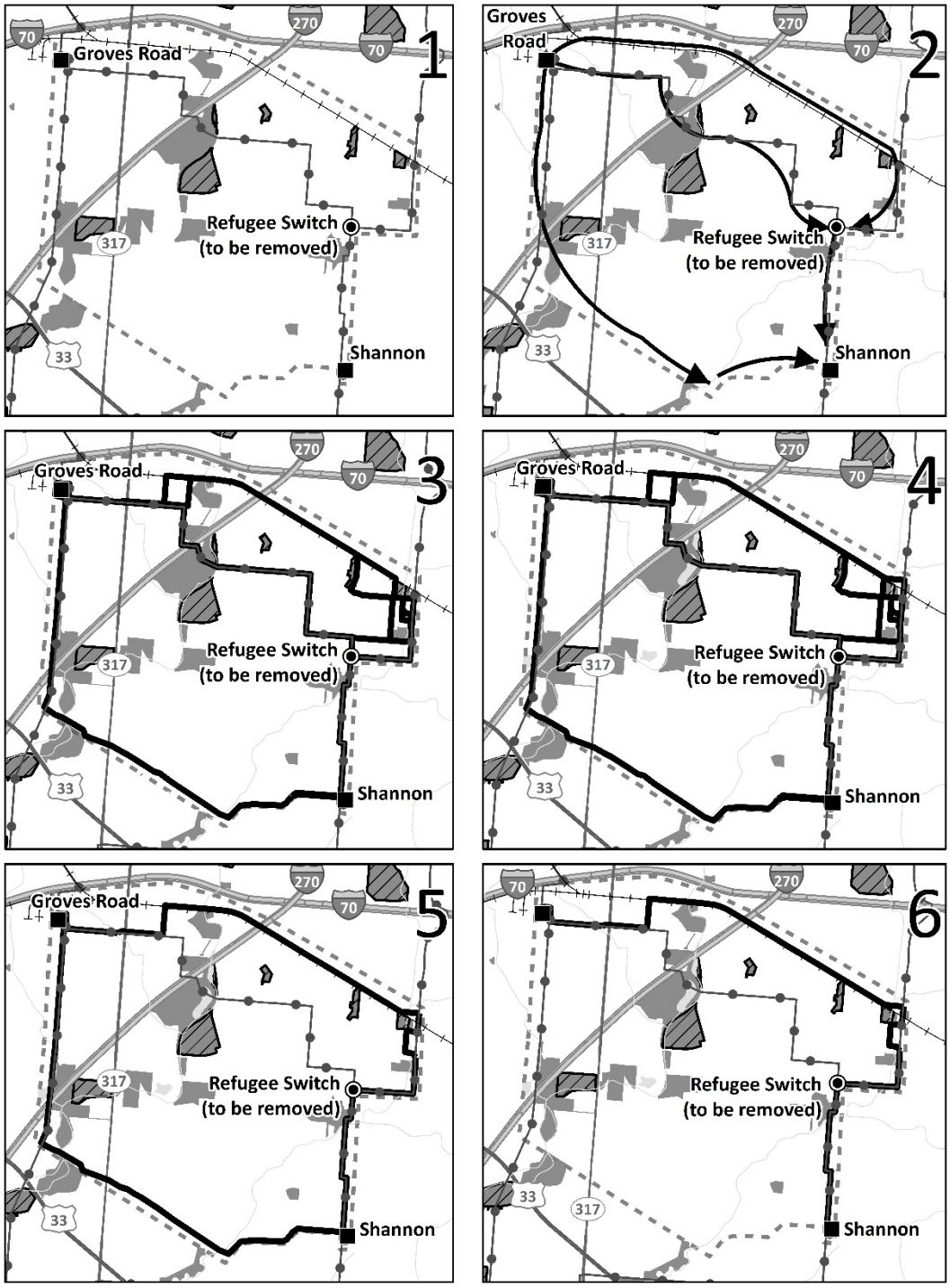


Figure 5. Route Development Process Steps

2.3 Data Collection

The following sources of information were used to develop data for the RSS. A detailed table of data sources is provided in **Attachment A**.

2.3.1 Geographic Information System (GIS) Data Collection

Digital aerial photography and geo-referenced topographic maps are both important tools for route selection and serve as essential base maps and information sources. The primary sources of aerial imagery and mapping used included:

- Ohio Georeferenced Imagery Program (OGRIP) 2019.
- United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) 2019.
- U.S. Geological Survey (USGS) 7½ minute topographic quadrangle maps: Reynoldsburg and Southeast Columbus.

Initial review of the Project area by the Siting Team identified likely opportunities and constraints. As additional data were collected the opportunity and constraint landscape was modified. The study used existing GIS data sets from varied sources, including federal, state, and local governments, mostly from official agency GIS data access websites. Where data was not available, the Siting Team digitized information from digital maps or aerial photographs. The team's geographers, natural resource scientists, and siting experts interpreted the physiography, geology, vegetation and land use of the area to supplement and enhance that available data from the state/federal agencies.

A certain amount of caution should be exercised when interpreting GIS data, as the sources vary with respect to their accuracy and precision. For this reason, GIS-based calculations and maps presented in this study should be considered reasonable approximations of the resource or geographic feature they represent and not absolute measures or counts. The data and calculations presented in this study allow for relative comparisons among project alternatives. Where possible and practical, field reconnaissance is conducted to verify certain features (e.g., locations of residential, commercial and industrial buildings).

2.3.2 Federal, State and Local Government Coordination

The Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route development process. The agencies contacted are listed below. Copies of agency correspondence are included as **Attachment C**.

Federal Agencies

- United States Fish and Wildlife Service ("USFWS")

State Agencies

- Ohio Department of Natural Resources ("ODNR")
- Ohio Department of Transportation ("ODOT")

Local Agencies and/or Officials

- Franklin County
- City of Columbus

2.3.3 Field Reconnaissance

Siting Team members field reviewed the preliminary Study Segments from public viewpoints in August 2020. The Study Segments were reviewed for compatibility with the local features and those local features were updated where it was clear there had been changes since the maps and aerial photographs were released. These features were then either edited or added to the GIS database.

In June and July of 2021, ecological field surveys were performed for the Project's route alternatives. The field delineated wetlands and waters resulting from the 2020 and 2021 ecological surveys[3] were added to the GIS database and used for analysis in lieu of national inventory databases.

2.3.4 Public and Stakeholder Input

The consideration of public and stakeholder input is critical to the route development process. Landowners and stakeholders provide information and recommendations to aid the Siting Team in the development and refinement of study segments and route alternatives. Typically, a project-specific outreach plan is developed which can include public open houses, websites, mailings, advertising, etc. More information on how public and stakeholder input was gathered and used for the Project can be found in **Section 3.6**.

[3] Additional delineated resources were previously identified in the Project Area in January and February 2020, for areas that coincide with the Shannon – Astor, Refugee – Groves Road, and Bixby – Shannon portions of the overall Southeast Columbus Area Improvements Project.

2.4 Siting Guidelines

The siting process involves first developing routes, then comparing them. To help develop those initial routes, the Siting Team uses the information developed for the area and technical requirements of the structures to help identify areas where the route cannot go, areas where the route should try to avoid (constraints), and areas where routing advantages are present (opportunities). These general and specific guidelines help refine the routing and reduce the number of potentially flawed segments. The scope is to propose viable, constructible routes from the start, and refine them logically into the most constructible and lowest impact.

The Siting Team began by identifying the existing Groves Road Station and the existing Shannon Station as the two Project endpoints (see **Section 3.1**). Conceptual routes were created between the two endpoints to avoid built environment and natural environment constraints based on knowledge of the area, field reconnaissance, and input and data received from federal, state, and local agencies and stakeholders. The Project Team then evaluated, compared, and refined various study segments to determine which is the most viable. Study Segments that are evaluated as less desirable are revised or eliminated.

2.4.1 General Guidelines

The detailed information developed, from aerial photograph, map and data review, helped form an understanding of the most influential siting factors in the area. The Siting Team used these and the technical requirements of the Project to develop the following general siting guidelines which were used to assist with route development:

- Avoid crossing or minimize conflict with designated state-owned or federal-owned lands (none were identified in the Project Area), as well as local government, private, and regional agency land, such as the Three Creeks Metropark, Brobst Memorial, Far East Recreational Center, and Elk Run, Helsel, Kirkwood, Kraner, Maybury, Nafzger, NOE-Bixby, and Walnut View parks.
- Avoid or minimize new crossings of City of Columbus park properties and easements, such as Amberfield Park, Big Walnut-Edgewater Park, Blacklick Creek Greenway Trail, Catalpa Park, Chatterton Brice Park, Deems Park, M-Five Park, Mason Run Park, Refugee Preserve, Shannon Park, Shelbourne Park, Sol Shenk Park, and Winchester Bend Park.
- Avoid or minimize new crossings of large lakes, streams (Big Walnut Creek, Blacklick Creek, and Mason Run) and their associated floodplain, floodway, and/or large wetland complexes, as well as critical and protected habitats or other unique or distinct natural resources.

- Avoid or minimize habitat fragmentation in unfragmented areas and impacts on designated areas of biodiversity concern.
- Maximize the separation distance from and/or minimize impact on dwellings and community facilities, cemeteries, schools, daycare facilities, hospitals, historic resources, and designated landmarks.
- Avoid or minimize conflict with existing land uses and future development with a proposed plan, schedule, and permitting process underway.
- Minimize interference with economic activities, natural gas activities, mining operations, and industrial facilities.
- Consider using or paralleling existing ROWs or other linear features and infrastructure when feasible, such as the AEP-owned Bixby – Groves Road, Refugee – Groves Road, and Shannon – Astor 138 kV transmission lines, in addition to existing local roads and railroad. When paralleling existing facilities, however, reliability issues and mitigation requirements must be evaluated.
- Consider paralleling property lines, land use breaks, and land cover edges.
- Consider property owner and stakeholder input.
- Avoid conflicts with designated public and military aviation facilities (none were identified within the Project Area).
- Minimize environmental impact and construction/maintenance costs by selecting shorter, direct routes.
- Consider safety with respect to construction, maintenance, and operation of the facilities.
- Consider construction concerns such as access, road traffic control, outages, pipeline mitigations, railroad interactions, existing telecommunication line and distribution line conflicts, etc.
    - Major highways within the Project Area include I-270, I-70, and OH-317. Major local roadways within the Project Area include Brice Road (CR 117), Chatterton Road (CR 340), Courtright Road (CR 114), Ebright Road (CR 118), Gender Road (CR 222), Groves Road (CR 510), Noe Bixby Road (CR 371), Old Refugee Road/Refugee Road (CR 14), Shannon Road (CR 118), and Winchester Pike (CR 376). Distribution lines are likely present along major local roads, given the predominantly mixed-use residential and commercial/industrial development in the Project Area.
    - An active Norfolk Southern railroad is within the northern portion of the Project Area, traveling in a general west-southeast direction.

- One high-pressure gas line runs adjacent south of Winchester Pike (CR 376). No additional existing pipelines were identified within the Project Area.

- Minimize environmental impact by considering routes that minimize the overall length of access roads, length on steep slopes, tree clearing required for the ROW, and waterbody crossings. Given the existing developed land use of the Project Area, steep slopes were not identified as a significant siting factor.

2.4.2 Technical Guidelines

Technical guidelines are driven by the physical characteristics and engineering limitations of the structures and lines themselves, design criteria necessary to meet AEP Ohio Transco design standards, North American Electric Reliability Corporation ("NERC") reliability standards, National Electric Safety Code ("NESC") standards, and industry best practices for construction. The technical guidelines were informed by (1) the technical expertise of engineers and other industry professionals responsible for the reliable, safe and economical construction, operation, and maintenance of electric system facilities, (2) NERC reliability standards as implemented by PJM (the regional transmission organization that monitors the electric grid in 13 states), and (3) industry best practices.

The Siting Team considers the following technical guidelines during study segment and route development to extent practical:

- Minimize crossing high voltage transmission lines, such as the Bixby – Groves Road, Bixby – Shannon, Groves Road – Bexley, Refugee – Groves Road, and Shannon – Astor 138 kV transmission lines.
- Consider paralleling extra-high-voltage ("EHV") transmission lines, unless other operational and system reliability issues are identified (none were identified within the Project Area).
- Maintain a minimum of 50 feet of centerline-to-centerline separation when paralleling 138 kV or lower voltage transmission lines
- When paralleling existing transmission lines, such as the Bixby – Groves Road 138 kV transmission line, verify there are no reliability issues by locating two lines adjacent to each other.
- When paralleling existing pipelines, evaluate mitigation requirements and any additional impacts and associated costs for construction and/or long-term maintenance (none were identified within the Project Area).
- Minimize structure angles greater than 45 degrees.

- Minimize structures on steep slopes (generally, this is more than 20% slopes for angle structures and more than 30% for tangent structures), particularly if guy wires are required for construction (topography was not identified as a significant siting factor for the Project).

3.0 ROUTE ALTERNATIVE IDENTIFICATION

3.1 Project Endpoints

The Project Endpoints are the Company's existing Groves Road and Shannon stations. The Groves Road Station is located approximately 0.4 mile west of the intersection of Courtright Road (CR 114) and Groves Road (CR 510). The Shannon Station is located approximately 0.5 mile east of the intersection of Shannon Road (CR 118) and Brice Road (CR 117).

3.2 Study Area Description

The Study Area is defined as the area in which line route alternatives can be routed to meet the purpose of the Project while reasonably minimizing environmental/land use impacts and Project costs. The Study Area for this Project was determined by defining a broad area between the two endpoints that included all practical/logical routing opportunities, while also limiting the overall line length to avoid unnecessary impacts and costs.

Consideration of the routing opportunities and endpoints resulted in an approximately 7.7-square-mile (mi^2) study area (the "Study Area," see **Map 1, Attachment A**). The Study Area is generally bounded by I-70, railroad, and the existing Groves Road Station to the north; the existing Shannon – Astor 138 kV transmission Line, Brice Road (CR 117), and the Village of Brice to the east; the existing Shannon Station, Shannon Road (CR 118), and Winchester Pike (CR 376) to the south; as well as the existing Bixby – Groves Road 138 kV transmission line, I-270, and OH-317 to the west.

Dominant surface water features within the Study Area include Big Walnut Creek, Blacklick Creek, and Mason Run, which all generally flow southwestward and have associated Federal Emergency Management Agency ("FEMA") designated floodplains and floodways within and beyond their riparian corridors. Additionally, several USFWS National Wetland Inventory ("NWI") wetlands are mapped within the riparian corridors, floodway, and/or floodplain of Big Walnut Creek, Blacklick Creek, and Mason Run. Man-made ponds and detention basins are also mapped throughout residential and commercial/industrial areas of the Study Area.

The Study Area is predominately composed of mixed-use residential and commercial/industrial land uses. Commercial and industrial properties are generally concentrated in the northwestern portion of the Study Area, adjacent southwest of the I-70/I-270 interchange, in an area referred to as Eastland. Additional commercial and industrial properties are present within the northeastern portion of the Study Area, adjacent west of Brice Road. Single-family and multi-family residences are generally concentrated within central, southern, and eastern portions of the Study Area, in subdivided neighborhoods including but not limited to: Blacklick Estates,

Crosscreek Village, Edgewater Park, Independence Village, Shannon Green, Three Rivers, Walnut Heights, and Winchester.

Five elementary schools, one high school, one middle school, and two scholarly academies are present within or close to residential subdivisions in the Project Area. There are 11 places of worship within the Study Area, which are predominantly located along local roads near residential areas. Two cemeteries were identified in the Study Area: Asbury Cemetery is located within the southern portion adjacent southeast of Noe Bixby Road (CR 371) and Winchester Pike (CR 376) and Truro Cemetery is located approximately 400 feet southeast of the intersection of Noe Bixby Road and Refugee Road (CR 14).

Recreational areas are located throughout the Study Area, these include 12 recreational parks along the Big Walnut Creek corridor in the western portion of the Study Area: Amberfield Parkland, Big Walnut – Edgewater Parkland, the Big Walnut Corridor, Catalpa Park, Deems Parkland, Deer Lake Parkland, Elk Run/Winchester Parkland, Helsel Park, Nafzger Park, Refugee Preserve, Sol Shenk Parkland, and Winchester Bend Parkland. Along the Big Walnut corridor, the City of Columbus maps three park easements: the Bre-Kro access easement and the Refugee Preservation Area conservation easement are located within the central portion of the Study Area, and the Winding Creek conservation easement is located within the northern portion of the Study Area.

Five additional City of Columbus recreational parks are located along the Blacklick Creek corridor in the eastern portion of the Study Area: Chatterton Brice Parkland, Chatterton Parkland, M-Five Parkland, Shannon Parkland, and Shelbourne Parkland. The City of Columbus additionally maps two park easements in the southeastern portion of the Study Area along the Blacklick Creek Corridor: the Shannon Road access easement and the M-Five conservation easement. The Blacklick Creek Trail traverses the southwestern portion of the Study Area, which provides walking and biking pathways along the Blacklick Creek corridor.

In the southwestern portion of the Study Area, the City of Columbus maps Mason Run Parkland and the Williams Conservation easement approximately 0.4 mile southwest of Groves Road and I-270, along the Mason Run corridor. Of these above-listed City of Columbus parks within the Study Area, the USGS Protected Areas Database of the US (PADUS) also identifies Helsel Park, Nafzger Park, and Shelbourne Parkland, in addition to Noe-Bixby Park, Maybury Park, and Walnut View Park, which are generally located within the northern portion of the Study Area.

Two highways bisect the eastern portion of the Study Area: I-270 travels in a northeast-southwest fashion and OH-317 travels north-south. Refugee Road (CR 14)/Chatterton Road (CR 340) bisects the central portion of the Study Area east to west and Noe Bixby Road (CR 371) bisects the central portion of the Study Area north to south; Winchester Pike bisects the southwestern portion of

the Study Area northwest to southeast; Shannon Road bisects the southeastern portion of the Study Area in a general east-west direction; and Brice Road bisects the eastern-most portion of the Study Area north-south. Many smaller local township and municipal roads are also located throughout the Study Area, which generally route through subdivided residential and mixed-use commercial/industrial areas. An active Norfolk Southern railroad runs adjacent to the northern portion of the Study Area in a general northwest-southeast trend.

Three existing AEP-owned 138 kV transmission lines are within the Study Area: Astor – Shannon, Bixby – Groves Road, and Refugee – Groves Road. The existing Bixby – Groves Road 138 kV transmission line is located within a 200-foot-wide easement owned by AEP. The National Pipeline Mapping System (NPMS) does not identify any oil/gas pipelines within the Study Area. There are two Federal Communications Commissions ("FCC") towers within the northeastern portion of the Study Area (Eastland), which are generally located between Groves Road and I-70. Another FCC tower was identified in the southwestern portion of the Study Area, along the eastside of OH-317 and approximately 0.5 mile south of Refugee Road (CR 14).

3.3 Constraints and Opportunity Features

The Siting Team identified and mapped siting constraints and opportunity features within the Study Area as described below and shown on the Study Area map (**Map 1, Attachment A**).

Constraints

Constraints are specific areas that should be avoided to the extent practical during route development. Using readily available public data sources, the Siting Team initially identified large constraints during the beginning of the route development process.

Natural Features

Big Walnut Creek, Blacklick Creek, and Mason Run flow southwestward through western and eastern portions of the Study Area. These major surface water features have generally wide forested and scrub-shrub riparian corridors containing floodway and floodplain, as well as NWI-mapped wetland complexes. Smaller tributaries of Big Walnut Creek and Blacklick Creek are also mapped in limited portions of the Study Area outside of developed areas. Large contiguous areas of forested cover are generally limited to the riparian corridors and floodplains of Big Walnut Creek, Blacklick Creek, and Mason Run. The Siting Team specifically considered streams, floodway, floodplain, and NWI-mapped wetlands as constraints present within the Study Area.

Recreational Areas and Protected Lands

Several recreational areas owned by the City of Columbus Parks and Recreation Department, or private entities are present within the Study Area, which generally serve as conservation areas with open space, hiking trails, fishing ponds, sports fields, and/or playgrounds (previously described above in **Section 3.2).** The locations of recreational areas and protected lands within the Study Area, generally coincide with the natural areas previously describe above. The Siting Team considered the City of Columbus parks and park easements, local government parks, and private parks as constraints present within the Study Area.

Small Scale Constraints

As the Siting Team developed Study Segments, smaller site-specific constraints were identified (using readily available public data sources, stakeholder input, and field inspections). Through the iterative process of route development (described in **Section 2.0**), the Study Segments were adjusted to avoid small constraints where feasible. Small constraints include but are not limited to individual residences (single-family residences, mobile homes, and multi-family buildings); individual listed or eligible resources under National Register of Historic Places (NRHP); commercial and industrial buildings; outbuildings, barns, and silos; cemeteries; churches; schools; small wetlands; radio and communications towers; and oil or gas wells.

Opportunity Features

Opportunity features include existing corridors, which are areas where a transmission line would be a compatible land use or where an existing linear feature would reduce a transmission line's visual impacts. These include utility corridors, railroad, and roads, but may also include unused portions of industrial or commercial areas and parcel boundaries. Paralleling and/or rebuilding existing linear infrastructure was identified as a key siting opportunity for the Project. All siting opportunity features evaluated are presented in the Study Area map (**Map 1, Attachment A**) and are described below:

Existing Transmission Lines

The existing AEP-owned 138 kV transmission lines identified in the Study Area present potential siting opportunities for connecting the Project Endpoints (see **Section 3.1**).

Approximately 4.5 miles of the Shannon – Astor 138 kV transmission line will be rebuilt as part of the overall Southeast Columbus Area Improvements Project. With this consideration, the Siting Team evaluated rebuild and double circuit opportunities in conjunction with the Shannon – Astor 138 kV Transmission Line Rebuild Project for approximately two miles of the Project. Routing concepts also considered single circuit rebuild of the existing Refugee – Groves Road 138 kV

transmission line and single circuit 138 kV transmission line parallel to the existing Bixby – Groves Road 138 kV transmission line, within existing ROW.

Local Roads

Several local roads within the Study Area were identified as siting opportunities, including Brice Road (CR 117), Chatterton Road (CR 340), Cloverleaf Street, Groves Road (CR 510), Shannon Road (CR 118), and Winchester Pike (CR 376). Based on their availability, location, and direction, the Siting Team evaluated local road paralleling opportunities for avoidance of encroaching densely populated subdivided residential areas (i.e., Blacklick Estates).

Railroad Corridors

The active Norfolk Southern-owned railroad bisects the northern portion of the Study Area in a general northwest-southeast direction and was considered a siting opportunity as it avoids encroaching residential properties along the existing transmission line. Railroads can, however, present siting constraints for transmission line projects, such as additional permitting requirements and fees.

Property Boundaries

Where paralleling or rebuilding existing linear infrastructure was unavailable, the Siting Team prioritized paralleling property boundaries. This siting opportunity can minimize impacts to property owners by potentially reducing impacts to more usable, central portions of the property.

3.4 Routing Concepts

Using the opportunity/constraint maps and siting guidelines developed for the Project by the Siting Team, and input from the multi-disciplinary Project Team, Routing Concepts identified within the Study Area are shown on **Map 2.** Generally, the Routing Concepts used local road and cross-country options while avoiding large- and small-scale constraints where possible. For descriptive purposes, the Project is divided into two areas: northeastern and southwestern.

Northeastern

In the northeastern portion of the Study Area, primary routing concepts were developed to consider rebuilding the existing Refugee – Groves Road 138 kV Transmission Line as single circuit and rebuilding the existing Shannon – Astor 138 kV Transmission Line as double circuit, in addition to paralleling transportation corridors and parcel boundaries. Notable constraints include Big Walnut Creek, Blacklick Creek, recreational areas, subdivided residential neighborhoods, and mixed-use commercial/industrial areas.

Southwestern

The routing concepts in the southwestern portion of the Study Area were developed to parallel the existing Bixby – Groves Road 138 kV transmission line within the existing 200-foot-wide ROW and local roads. Constraints include subdivided residential neighborhoods, such as Blacklick Estates, Big Walnut Creek, Blacklick Creek, Mason Run, and recreational areas.

The next step in the siting process was to refine the Routing Concepts into Study Segments. This process is described below.

3.5 Study Segment Development

In 2020, the Siting Team developed a series of revised Study Segments based on the route development process and criteria described in **Section 2.0** and shown in **Map 3b, Attachment A**. Study Segments are partial alignments developed based on the Routing Concepts identified in the previous section.

Early in the Study Segment development process, the Siting Team noted concerns of residential encroachments for rebuilding within the existing Refugee – Groves Road 138 kV Transmission Line ROW. To address these concerns, the Siting Team used approximately 0.7 mile of the existing Refugee – Groves Road 138 kV ROW within industrial areas surrounding the Groves Road Station to develop rebuild Study Segments. In addition, the Siting Team developed greenfield Study Segments paralleling existing linear infrastructure, including roads and railroad, further away from dense residential areas. Due to the concerns noted above and the presence of viable greenfield Study Segments, the remaining 3.2 miles of the Refugee – Groves Road 138 kV Transmission Line will be retired. Similarly, some portions of the existing Shannon – Astor 138 kV Transmission Line ROW were also not suitable for rebuild near the Village of Brice due to residential encroachment concerns. To address these concerns, the Siting Team developed some greenfield Study Segments between Refugee Road (CR 14) and Chatterton Road (CR 340), which primarily paralleled parcel boundaries or local roads.

After the first virtual open house period held in November 2020, the revised Study Segments were further modified and some were removed and added, resulting in two Project Route Alternatives (**Attachment A, Map 4**). The Route Alternatives were presented during a second combined virtual and in-person open house period held in December 2021, and, afterward, were further evaluated as detailed below in **Section 5.0**.

3.6 Public Involvement Process

3.6.1 Public Communications and Open House

AEP Ohio Transco representatives mailed letters to area landowners in October 2020, for the November 2020 virtual open house meeting, to announce the Southeastern Columbus Area Improvements Project and notify them about the upcoming 35 virtual open house meeting, where they could learn more and provide feedback. The first virtual open house period took place between November 16th and December 4th, 2020, announcing a total of 35 preliminary Study Segments for the Groves Road – Shannon 138 kV Transmission Line Project (**Map 3a, Attachment A**).

After the public's commentary of the preliminary Study Segments were reviewed, evaluated, and modified, a resulting network of 31 revised Study Segments (**Map 3b, Attachment A**) were developed into two Route Alternatives for the Groves Road – Shannon 138 kV Transmission Line Project. For the second combined virtual and in-person open house meeting, AEP Ohio Transco representatives mailed letters to area stakeholders and landowners in November 2021 to notify them about the upcoming meeting and virtual open house, presenting the two Route Alternatives. The in-person open house occurred on December 15, 2021, and the virtual open house period took place between December 15 and December 20, 2021.

For both open houses, letters were sent to local stakeholders as well as property owners crossed, adjacent, or within 250 feet of the ROW of either the preliminary Study Segments or the Route Alternatives of both the Shannon – Astor 138 kV Rebuild Project and the Groves Road – Shannon 138 kV Transmission Line Project. In the Project announcement, the Project was referred to as the Southeastern Columbus Area Improvements Project, which included (1) building approximately 5 miles of 138 kV transmission line between Groves Road and Shannon Stations (2) rebuilding approximately 2 miles of 138 kV transmission line between Astor Station and an existing power line off Brice Road; and (3) Expanding Shannon Station near the intersection of Shannon Road and Brice Road. During the first open house period, AEP Ohio Transco also announced the Project via digital ads on Facebook, which specifically targeted residents of the affected area and allowed such Facebook users to comment on the ad, in addition to providing a link to the Project's website (aeptransmission.com/ohio/SoutheastColumbus/). The mailings to area stakeholders and affected property owners consisted of a letter and fact sheet, which provided an overview of the Project and a link to the Project's website. The mailings also included contact information for the AEP Ohio Transco Outreach Specialists. A news release was posted to the AEP Ohio Transco website to announce the Project and in-person/virtual open houses.

3.6.2 Project Website and Virtual Open House

The Project Team set up a Project website with a link to the each of the virtual open house components. The virtual open houses were set up similarly to an in-person open house, with virtual "stations" and information related to engineering and design of the structures, the Project need, real estate and ROW issues, and the siting process. An interactive map was provided at the virtual open house for the public to review. Participants were encouraged to document the location of their houses, places of business, properties of concern, or other sensitive resources on virtual comment cards. A combined total of 21 comments were received from property owners between the November 2020 and December 2021 open house meetings (virtual and in-person). After each public open house, digital comments were entered into a GIS database. Subjects of the comments ranged from impacts to crop production, concerns with viewshed, and questions on maintenance.

3.6.3 Consideration of Public and Stakeholder Input

Comments were cataloged and categorized based on the relevancy and topic. Most comments were related to impacts to agricultural activities and proximity of the lines to residences. Several Facebook users expressed support for the Project on the digital ads, indicating that the current system is often unreliable during weather events. Numerous comment cards expressed curiosity regarding potential outages or impacts to underground utilities resulting from the Project, and some of these landowners provided locations of undocumented underground utilities. For example, multiple landowners provided the location of an underground high-pressure gas line adjacent south of Winchester Pike (CR 376) during the in-person open house in December 2021. Fewer comment cards expressed opposition to the placement of Study Segments or the Route Alternatives, based on impacts to residential, agricultural, or commercial/industrial land uses. Upon reviewing the comments, the Siting Team incorporated the information, where applicable, when reviewing, revising, and comparing Route Alternatives.

3.7 Study Segment Evaluation and Refinement

The revised Study Segments, shown on **Map 3b, Attachment A**, were evaluated and refined to avoid or minimize impacts to resources in the Study Area. Through the Study Segment evaluation and refinement process, the Siting Team identified an option that paralleled the westside of the existing Bixby – Groves Road 138 kV Transmission Line within existing, unmaintained ROW as a feasible southward routing option to address concerns related to potential residential encroachment concerns of other greenfield Study Segments.

For descriptive purposes, the Study Segments were divided into northern and southern segments, as shown on the inset **Figures 5a and 5b** below. Study Segments in each geographic region were evaluated, modified, and some were added or removed from further consideration,

as described below. Those removed are identified with dashed black lines, those retained with solid black lines.

Northern Study Segments - Two main Study Segment corridors were considered to exit the Groves Road Station eastward and northward to cross the railroad and parallel the northside of its corridor. Rebuilding a large portion of the existing Refugee – Groves Road 138 kV transmission line was not considered viable due to potential residential encroachment concerns and was removed from further consideration. For exiting the Groves Road Station, the first Study Segment routes in a general eastward direction by rebuilding a small portion of the existing Refugee – Groves Road 138 kV transmission line in existing ROW and paralleling the northside of Groves Road. At this point, the first option (Study Segment 34) routes northward by paralleling the eastside of Cloverleaf Street and the second option (Study Segment 33) continues further eastward along the northside of Groves Road before routing northward through commercial/industrial properties. The Siting Team ultimately retained the first option because it parallels existing road ROW to the greatest extent and is farther from recreational areas (Sol Shenk Parkland and Catalpa Park) and residential properties when compared to the second option.

Several Study Segments were considered that connect from the railroad corridor to the existing Shannon – Astor 138 kV transmission line. Study Segments close to recreational areas and residential subdivisions were eliminated due to effects on the natural and built environment, while providing no benefit over other options, which paralleled the railroad for longer and used more existing ROW. Based on City of Columbus Parks input, the eastern-most Study Segment was revised to turn east, north of Shelbourne Parkland, which resulted in additional double circuit construction length, primarily within the existing Shannon – Astor 138 kV transmission line ROW (as shown on **Attachment A, Map 4**). A small portion of this section cannot use the existing Shannon – Astor 138 kV transmission line ROW. A 0.4 mile greenfield re-route (Study Segments 19 and 24) near the intersection of 117 and the railroad is needed to avoid potential residential encroachments.

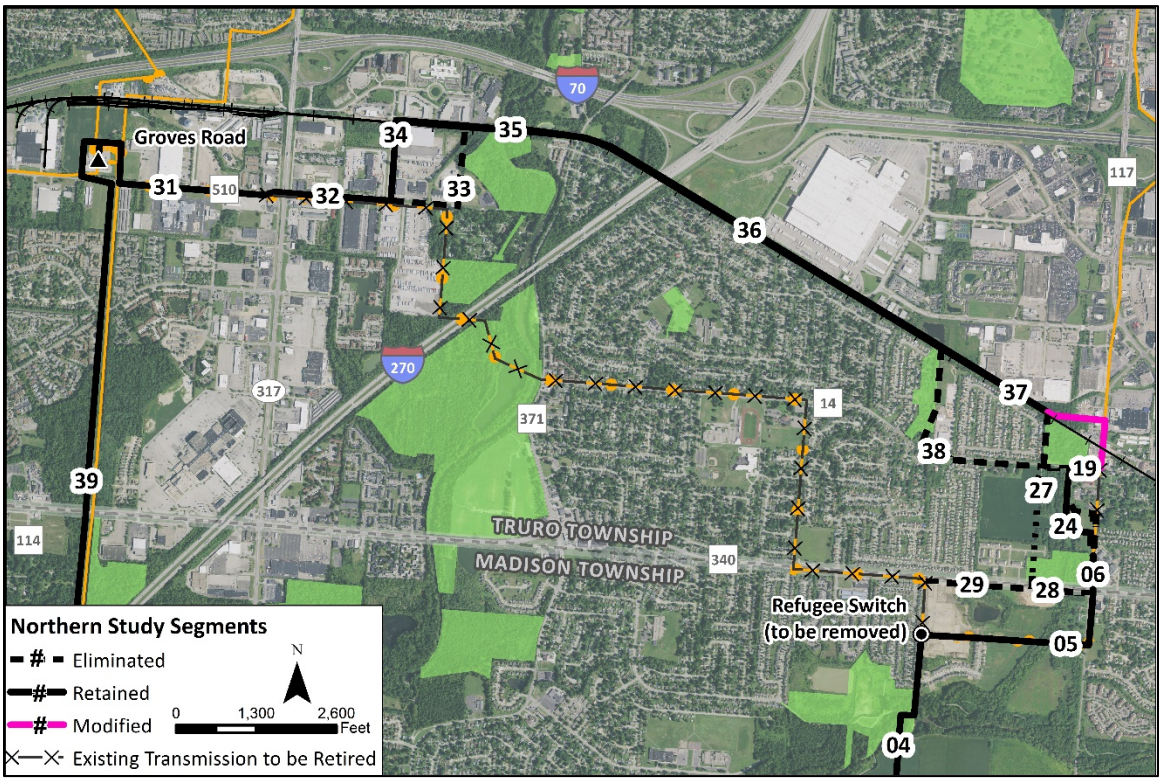


Figure 6a. Northern Study Segments

Southern Study Segments – Two main siting opportunities were used in the southern study area was using the existing unmaintained ROW adjacent to the Bixby – Groves Road 138 kV line and paralleling Winchester Pike (CR 376). In addition, two main corridors were developed to connect to the Shannon Station. One option parallels the northside of Shannon Road and the other option parallels the southside of Shannon Road. The Siting Team identified the presence of an AEP-owned distribution line on the northside of Shannon Road and supported distribution underbuild for that Study Segment. Thus, the Study Segment paralleling the southside of Shannon Road was eliminated.

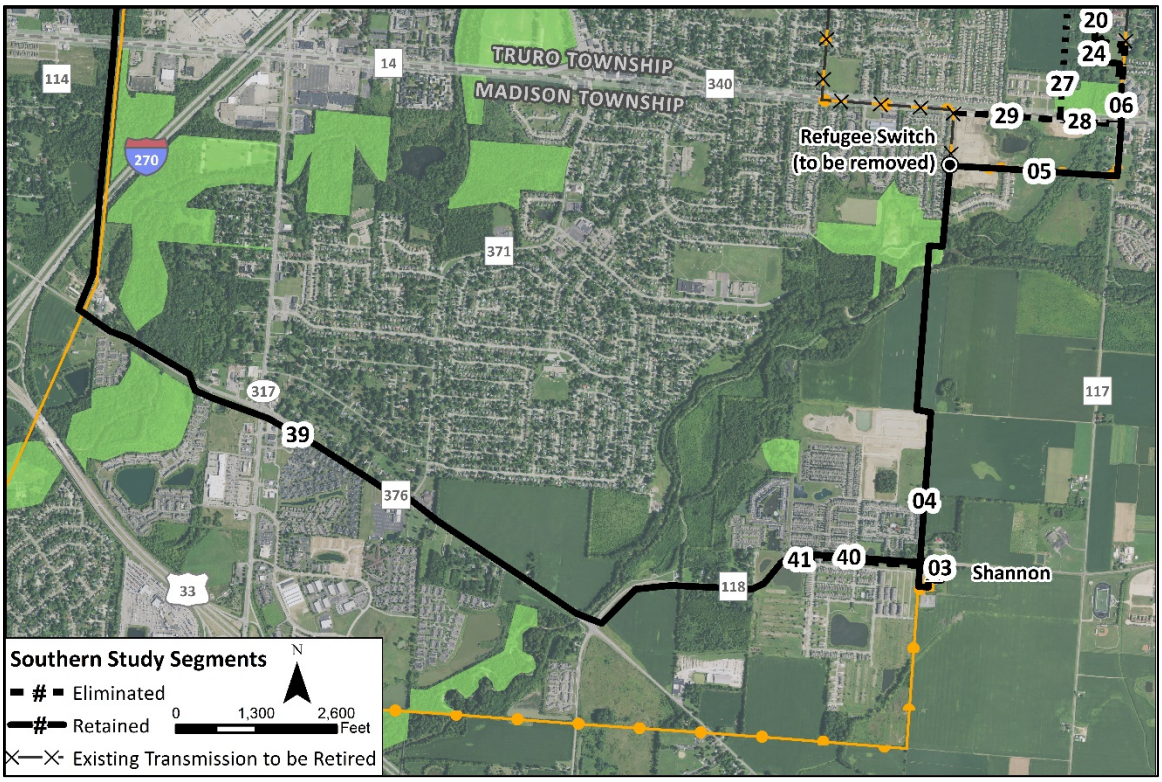
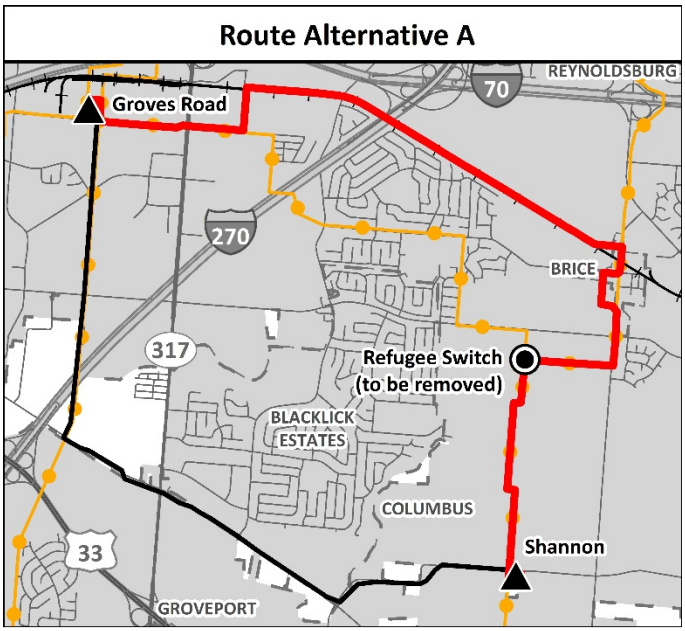


Figure 7b. Southern Study Segments

Map 4, Attachment A shows the Revised Study Segments from this review, resulting in two Route Alternatives, which are discussed in **Section 4.0** and compared in **Section 5.0**.

4.0 ROUTE ALTERNATIVES

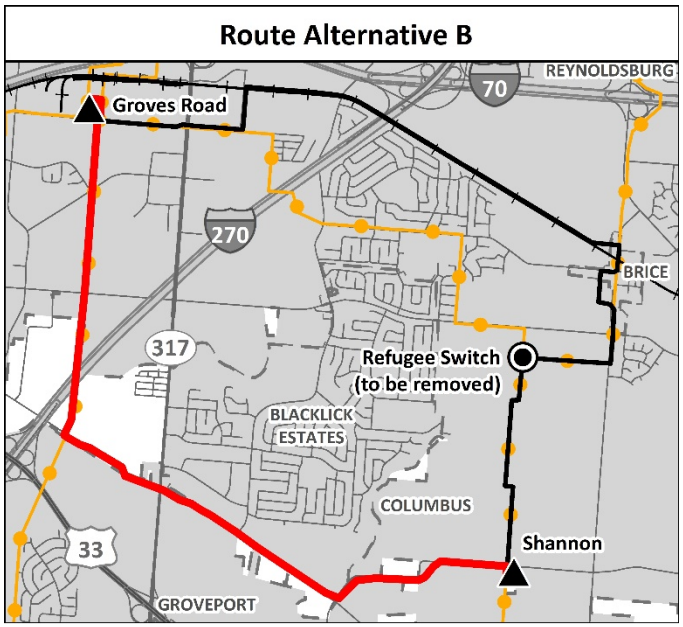
The Siting Team met and communicated frequently throughout the route development process, continually reviewing, modifying, and sometimes eliminating Study Segments based on field inspections, analysis, and engineering reviews. At the end of the process, the Siting Team compiled the remaining Study Segments into two complete Route Alternatives (Routes A and B) for analysis and comparison. These two Route Alternatives are described in the following sections and are shown in more detail on **Map 4, Attachment A**.



4.1.1 Route Alternative A

Route Alternative A is the northeastern routing option, measuring approximately 6.6 miles in length. Route Alternative A was selected for analysis because it proposes to use more existing maintained ROW, by double circuiting with a portion of the Shannon – Astor 138 kV transmission line. Route Alternative A begins at the Groves Road Station and proposes to rebuild approximately 0.7 mile of the existing Refugee – Groves Road 138 kV transmission line as double circuit and in existing ROW. Before crossing OH-317, Route Alternative A shifts to single circuit construction on new ROW and parallels Groves Road to the north. At Cloverleaf Street, Route Alternative A turns north towards the railroad corridor. At this point, Route Alternative A travels in a general southeastward direction for approximately 2.3 miles by paralleling the northside of the railroad corridor. For its remaining approximately 3 miles, Route Alternative A is a double circuit rebuild of the Shannon – Astor 138 kV transmission line and the Project, mostly within existing, maintained ROW. A small portion of this three mile section cannot use the existing Shannon – Astor 138 kV transmission line ROW. A 0.4 mile greenfield re-route area near the intersection of 117 and the railroad is needed to minimize impacts to a residential area; the greenfield re-route is parallel to road and parcel boundaries. Lastly, a 0.1 mile greenfield portion is needed where the circuits split at the Shannon Station and is fully located on AEP Ohio Transco property. Route Alternative A would require approximately 27.3 acres of new ROW and would use approximately 21 acres of existing, maintained 138 kV transmission line ROW.

4.1.2 Route Alternative B



Route Alternative B is the southwestern and shortest routing option, approximately 5.2 miles long. Route Alternative B parallels local roads and an existing 138 kV transmission line within existing, unmaintained ROW owned by the Company for approximately half of the route's entire length. Route B begins at Groves Road Station and routes southward by rebuilding the existing Refugee – Groves Road 138 kV transmission line for 0.2 mile. Route Alternative B continues south for approximately two miles by paralleling the westside of the existing Bixby – Groves Road 138 kV transmission line within unmaintained ROW. At this point, Route Alternative B turns southeastward primarily paralleling Winchester Pike and Shannon Road for approximately three miles; Route Alternative B crosses from one side of the road to the other to avoid encroaching residential or commercial properties. The remaining 0.1 mile of Route Alternative B proposes rebuild within the existing Astor-Shannon 138 kV transmission line ROW for tie-in to Shannon Station. Route Alternative B would require approximately 21.3 acres of new ROW and would use approximately 16.2 acres of an existing AEP-owned 200-foot-wide easement.

5.0 ROUTE ALTERNATIVE COMPARISON

The Route Alternative comparison provides a quantitative and qualitative analysis of potential impacts to local communities, environment, and cultural resources and considers engineering and constructability concerns. The Route Alternatives were reviewed in detail and compared using a combination of information collected in the field, GIS data sources, public input, supporting documents, and the collective knowledge and experience of the Siting Team.

5.1 Natural Resources

Natural resource considerations include potential effects on vegetation and habitat, surface waters, threatened and endangered species, and conservation and recreation lands. Potential effects discussed in this section are based on publicly available maps and data as well as consultation with federal and state agencies. A comparison of the natural environment considerations for the Route Alternatives is presented at the end of this section in **Table 1**.

5.1.1 Geological, Soil, and Water Resources

Resource Characteristics

The US Environmental Protection Agency (USEPA) maps the Study Area within the Loamy, High Lime Till Plains Level IV Ecoregion (55b) of the Eastern Corn Belt Plains Level III Ecoregion (55) [4]. The Loamy, High Lime Till Plains Level IV Ecoregion contains soils that developed from loamy, limy, glacial deposits of the Wisconsinan age, which support natural drainage and fertility. There are 46 USDA National Resources Conservation Service (NRCS) soil mapping units of the Alexandria, Bennington, Cardington, Celina, Crosby, Eel, Eldean, Genesee, Kendallville, Kokomo, Medway, Miamian, Pewamo, Ross, Shoals, Sleeth, Thackery, Udorthents, or Westland consociations and/or complexes within the Study Area. Soil mapping units within the Study Area do not exceed slopes greater than 12 percent. Elevation within the Study Area ranges from approximately 725 to 800 feet above mean sea level (msl).

The US Army Corps of Engineers ("USACE") and OPEA regulates lakes, rivers, streams, wetlands, and ponds in Ohio. The Study Area is within the USACE Huntington District and the Upper Scioto [Hydrologic Unit Code ("HUC") 05060001] watershed. As shown on **Map 5, Attachment A,** the USGS National Hydrology Database ("NHD") maps Mason Run flowing southward through the western portion of the Study Area, in addition to Big Walnut Creek and Blacklick Creek flowing generally southwestward through the central and eastern portions of the Study Area,

[4] USEPA Level III and Level IV Ecoregions of Ohio and Indiana, https://gaftp.epa.gov/EPADataCommons/ORD/Ecoregions/oh/ohin_eco_lg.pdf

respectively. The NHD also identifies smaller unnamed headwater tributaries of Big Walnut Creek, Blacklick Creek, and Mason Run sparingly throughout the Study Area.

The FEMA National Flood Hazard Layer ("NFHL") maps regulatory floodway and 100-year floodplains within the Study Area, primarily along riparian corridors of Big Walnut Creek, Blacklick Creek, and Mason Run. The USFWS National Wetland Inventory ("NWI") also identifies several palustrine emergent ("PEM"), palustrine forested ("PFO"), palustrine scrub-shrub ("PSS"), and palustrine unconsolidated bottom ("PUB") wetlands throughout the Study Area, primarily along riparian corridors or floodplains of Big Walnut Creek, Blacklick Creek, and Mason Run. No designated waters for special protection are located within the Study Area.

In addition to a desktop review of available wetland and water databases, a Wetland and Waters Delineation of an approximately 362-acre Environmental Survey Corridor ("ESC") of the Route Alternatives occurred in June and July 2021[5]. During the pedestrian surveys, ecologists verified the locations and lengths of Big Walnut Creek, Blacklick Creek, and Mason Run within the ESC, and delineated 5 additional streams within the ESC. The Wetland and Waters Delineation pedestrian surveys also identified 8 PEM wetlands, two PSS wetlands, three PFO wetlands, two PEM/PFO wetland complexes, one PEM/PSS wetland complex, one PEM/PUB wetland complex, and 17 ponds within the Project's ESC. The locations of these field verified wetlands and waters were utilized for analyzing streams and waterbodies crossed by the proposed centerline and wetlands in the proposed ROW (see **Table 1**).

Transmission line construction activities, such as vegetation clearing, access road construction, grading, and foundation construction, can affect soil and water resources by disturbing the native structure of the soil, and thereby creating areas of higher erosion potential, compaction, and lower soil permeability/fertility, and by delivering eroded soil to nearby streams through sedimentation. Therefore, flat terrain is preferred to mitigate erosion potential, and the Routing Study considers prime farmland soils[6] and slopes as factors when comparing routes.

Wetland disturbance can be minimized by avoiding wooded wetlands and avoiding or spanning PEM and PSS designated wetlands. Spanning PFO wetlands does not avoid impacts as the trees must be removed within new uncleared ROW, changing the wetland status. AEP Ohio Transco will obtain all necessary permits and employ specified best management practices ("BMPs") to minimize potential impacts on jurisdictional wetlands, as well as soil erosion and sedimentation during construction activities. Areas cleared within the ROW will be re-vegetated with compatible

[5] Additional delineated resources were previously identified in the Project Area in January and February 2020, for areas that coincide with the Shannon – Astor, Refugee – Groves Road, and Bixby – Shannon portions of the overall Southeast Columbus Area Improvements Project.

[6] Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops.

species and maintained in accordance with AEP's Vegetation Management Plan. Constructability and geotechnical issues are discussed in **Section 4.3**. In general, flat terrain away from rivers, streams, and waterbodies with good access and minimal hydric soil is desired.

PFO wetlands are an important constraint for overhead transmission siting, as they are typically the only wetland type that is permanently altered by ROW clearing. PFO wetlands within the ROW are permanently cleared of trees, changing PFO to PEM or PSS, and would likely require permitting from the USACE and OEPA. A goal during siting is to minimize the need for wetland permitting through reducing wetland acreage impact and minimize impacts to forested (or wooded/PFO) wetlands. AEP Ohio Transco often uses synthetic or wood matting for temporary access across such areas, requiring a pre-construction notification ("PCN") with the USACE for the temporary impact to wetlands. AEP Ohio Transco will minimize in-stream and wetland impacts, regardless of the route selected, by spanning or avoiding them to the best extent practical. Wetland, riparian, and flood hazard mitigation for permanent impacts to regulated areas are required, regardless of the route selected.

Route Alternative Comparison

Route Alternatives were compared in terms of number of delineated stream crossings, number of field delineated waterbodies crossed, acres of field delineated PEM, PSS, or PFO wetlands within the ROW, acres of FEMA-designated floodway or 100-year floodplains within the ROW, and acres of prime farmland within the ROW. A field wetland delineation was conducted for the route alternatives to account for any un-inventoried wetlands and/or streams, in addition to confirming the actual acreage of any wetlands and/or streams within the Project's ESC.

As shown in **Table 1**, Route Alternative B would require fewer delineated stream crossings (4), compared to Route Alternative A (7 total). Of the 7 stream crossings by Alternative Route A, one is located within the existing Refugee – Groves Road 138 kV Transmission Line ROW and two others are located within the existing Shannon – Astor 138 kV ROW, which are already within maintained ROW.

Route Alternative B parallels existing road for over half of its alignment (2.7 miles), where existing culverts and bridges were observed during field surveys. Route Alternatives A and B cross a similar amount of PFO wetlands in the ROW (0.3 and 0.2 acres, respectively); however, Route Alternative B contains more PEM wetlands (0.8 acres) in the ROW.

Route Alternative A contains less 100-year floodplain in the ROW (4.8 acres) and Route Alternative B contains 7.6 acres. By contrast, Route Alternative A contains more FEMA-designated floodway in the ROW (4.9 acres to 4.0 acres). Route Alternative A contains more prime farmland soils (41.8 acres); however, the majority of these soils are already either located

within commercial/industrial properties and/or within the existing Shannon – Astor 138 kV Transmission Line ROW.

Preliminary engineering plans for the Project estimates that Route Alternative B will require installing nine structures within FEMA-designated floodway areas and 19 structures within FEMA-designated 100-year floodplain. Route Alternative A will require the installation of 11 structures within FEMA-designated floodway areas and 13 structures within FEMA-designated 100-year floodplain; of these combined 24 structures, nine will be replaced in locations already disturbed by existing Shannon – Astor 138 kV Transmission Line structures. Therefore, Route Alternative A proposes less impact to FEMA-designated areas when compared with Route Alternative B.

Route Alternative B fares slightly more favorably for soil and hydrological criteria, as the proposed centerline crosses fewer streams and the ROW crosses a lesser amount prime farmland soils, PFO wetlands, and FEMA regulatory floodway.

5.1.2 Wildlife Habitat and Sensitive Species

Resource Characteristics

The potential for disturbance to vegetation and wildlife habitats can be generally assessed by comparing tree clearing along each Route Alternative. Other than in areas requiring tree clearing, permanent vegetation loss is limited to the transmission structure footprint, and construction of the Project would result in minimal permanent habitat changes. No karst features, sinkholes, or caves are documented within the Study Area. Contiguous areas of forest cover are generally limited to the riparian corridors of Big Walnut Creek, Blacklick Creek, and Mason Run. Small patches of urban forest are scattered throughout the Study Area, primarily along local roads and in residential areas. Agricultural land is generally confined to the southeastern portion of the Study Area.

Agency coordination was initiated with the Ohio Department of Natural Resources (ODNR) and USFWS in August 2021 to inform them of the Project and request data to assist route planning. Responses were received by ODNR and USFWS on September 13, 2021 and August 27, 2021, respectively. Copies of agency correspondence letters for the Study Area are included in **Attachment C**, in addition to the Project's threatened and endangered species field survey results. The ODNR Environmental Review response included comments and recommendations from the Division of Wildlife ("DOW") and results of an Ohio Natural Heritage Database ("ONHD") search. The ONHD identified four managed areas within a one-mile radius of the Project: Pickerington Ponds Metro Park, Three Creeks Metro Park, Big Walnut Greenway, and Blacklick Creek Greenway Trail – Columbus and Franklin County Metro Parks. USFWS indicated that there are no federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of the Project.

Freshwater Mussel Species

The ODNR response was typical in its recommendation of implementing seasonal tree cutting; avoidance or minimize impacts to streams, wetlands, and other water resources to the fullest extent possible; and that best management practices be used to minimize erosion and sedimentation. The ONHD identified records of identified two state-listed mussel species: the state species of concern elktoe (*Alasmidonta marginata*) and the state species of concern wavy-rayed lampmussel (*Lampsilis fasciola*), in addition to the state threatened Tippecanoe darter (*Etheostoma tippecanoe*) fish within a 1-mile radius of the Study Area.

The DOW further identified that the Study Area is within the ranges of 15 additional state or federally listed freshwater mussels: the federally endangered purple cat's paw (*Epioblasma o. obliquata*), the federally endangered clubshell (*Pleurobema clava*), the federally endangered northern rifffleshell (*Epioblasma torulosa rangiana*), the federally endangered rayed bean (*Villosa fabalis*), the federally endangered snuffbox (*Epioblasma triquetra*), the federally threatened rabbitsfoot (*Quadrula c. cylindrica*), the state endangered elephant-ear (*Elliptio c. crassidens*), the state endangered long solid (*Fusconaia maculate maculate*), the state endangered Ohio pigtoe (*Pleurobema cordatum*), the state endangered pocketbook (*Lampsilis ovata*), the state endangered washboard (*Megalonaias nervosa*), the state threatened black sandshell (*Ligumia recta*), the state threatened fawnsfoot (*Truncilla donaciformis*), the state threatened pondhorn (*Uniomerus tetralasmus*), and the threehorn wartyback (*Obliquaria reflexa*).

Ohio Mussel Survey Protocol Group 2, 3, and 4 streams will require a mussel survey. Group 1 streams and unlisted streams with a watershed greater than five square miles (mi^2) (e.g., Big Walnut Creek, Blacklick Creek) should be assessed using a reconnaissance survey to determine the presence of freshwater mussels. Further mussel surveys may be recommended for Group 1 streams following completion of a reconnaissance effort. Requirements of freshwater mussel reconnaissance and survey efforts are explained in the Ohio Mussel Survey Protocol. If in-water work is planned in any stream with a watershed greater than 5 mi^2 at the point of impact, DOW recommends that information indicating that mussel impacts will not occur be provided. If this is not possible, the DOW recommends that a professional malacologist conduct survey and relocation efforts in accordance with the Ohio Mussel Survey Protocol. No in-water work is anticipated for the Project; therefore, no adverse impacts to protected mussel species is anticipated.

Freshwater Fish Species

The DOW indicated that the Study Area is within the ranges of 11 state or federally listed freshwater fish species: the federally endangered Scioto madtom (*Noturus trautmani*), the state threatened goldeye (*Hiodon alosoides*), the state threatened Iowa darter (*Etheostoma exile*), the

state threatened popeye shiner (*Notropis ariommus*), the state endangered northern brook lamprey (*Ichthyomyzon fossor*), the state endangered spotted darter (*Etheostoma maculatum*), the state endangered shortnose gar (*Lepisosteus platostomus*), the state endangered tonguetied minnow (*Exoglossum laurae*), the state threatened lake chubsucker (*Erimyzon sucetta*), the state threatened paddlefish (*Polyodon spathula*), and the state threatened Tippecanoe darter. The DOW recommends in-water work restriction dates from April 15 to June 30 in perennial streams to avoid adverse impacts to these species. During the previous waters and wetland delineation for the Project, eight perennial streams were identified within the ESC, including Big Walnut Creek, Blacklick Creek, and Mason Run. If no in-water work is proposed in a perennial stream, the Project is not likely to affect these fish or other aquatic species.

Bird Species

The DOW also indicated that the Study Area is located within ranges of 8 state listed bird species: the state endangered American bittern (*Botaurus lentiginosus*), the s the state endangered cattle egret (*Bubulcus ibis*), the state threatened black-crowned nigh-heron (*Nycticorax nycticorax*), the state threatened least bittern (*Ixobrychus exilis*), the state endangered northern harrier (*Circus cyaneus*), the state endangered lark sparrow (*Chondestes grammacus*), and the state threatened sandhill crane (*Grus canadensis*). Results of the threatened and endangered species portion of the Environmental Survey Report indicate that no suitable habitat for these bird species were identified within the ESC; therefore, no adverse impacts to the state or federally listed bird species or their habitat are anticipated as a result of the Project.

Bat Species

As anticipated, the DOW indicated that the entire state of Ohio is within the range of the Indiana bat, northern long-eared bat, little brown bat, and tricolored bat. Between April 1 and September 30, these species predominantly roost in trees behind loose, exfoliating bark, in crevices and cavities, or in leaves; however, the DOW advised that these species are also dependent on the forest structure surrounding roost trees. Therefore, the DOW recommends that any tree cutting activity occurs only between October 1 through March 31, conserving suitable roost trees as well as trees greater than 20 inches dbh whenever possible.

Similarly, USFWS identified the Indiana bat and northern long-eared bat in their response. USFWS also recommends seasonal tree clearing for the Project. Both agencies require presence/absence surveys if suitable habitat is present and seasonal tree clearing cannot be implemented. In addition to seasonal tree cutting recommendations, the DOW also recommended that a desktop assessment is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the Project area. As part of the Project's threatened and

endangered species survey, ecologists performed a desktop review to address this recommendation. The desktop review did not identify any potential hibernacula for the Project.

The potential for disturbance to vegetation and wildlife habitats can be generally assessed by comparing each Route Alternative with respect to the anticipated acreage of tree clearing. As previously mentioned, other than in areas requiring tree clearing, permanent vegetation loss is limited to the transmission structure footprint, and construction of the Project would result in minimal permanent changes to habitat. Where required by the USFWS and/or ODNR, AEP Ohio Transco will complete species-specific field surveys and submit a survey report to the USFWS and/or ODNR. To minimize potential construction-related effects on federal and state listed plant and wildlife species, AEP Ohio Transco would adhere to permit conditions imposing seasonal work restrictions based on sensitive life stages.

Route Alternative Comparison

Although both alternatives use existing ROW for most of their alignment, Route Alternative A would require more tree clearing (11.2 acres), which is predominantly located along the northside of the railroad corridor. Consequently, Route A has the greatest potential to impact state and/or federally protected bat habitat due to the additional tree clearing. As shown below in **Table 1**, Route Alternative B would require less amount of tree clearing (2.8 acres); therefore, Route Alternative B has less potential to impact state and/or federally protected bat species habitat; however, for either route alternative trees will be cut between October 1 through March 31 to minimize impacts. Additionally, as previously mentioned above, no potential hibernacula were identified for the Project as part of a desktop review.

Neither of the route alternatives cross any other known federal wilderness area, wildlife refuge, or critical habitat area designated by the USFWS.

Table 1. Natural Resource Evaluation Criteria

Route Alternative	Unit	A	B
General			
Length	miles	6.6	5.2
Total 60-foot ROW	acres	48.3	37.5
Greenfield ROW	acres	27.3	21.3
Water Resources			
Field Delineated Streams Crossed by Centerline	count	7	4
Field Delineated Waterbodies Crossed by Centerline	count	1	1
Field Delineated PEM Wetlands in the ROW	acres	0.3	0.8
Field Delineated PFO Wetlands in the ROW	acres	0.3	0.2
Field Delineated PSS Wetlands in the ROW	acres	0	0.02
FEMA-designated Floodway Crossed by ROW	acres	4.9	4.0

Table 1. Natural Resource Evaluation Criteria			
Route Alternative	**Unit**	**A**	**B**
FEMA-designated 100-year Floodplain Crossed by ROW	acres	4.8	7.7
Geological, Topographical, and Soil Resources			
Not Prime Farmland in the ROW[7]	acres	12.2	15.7
All Areas Are Prime Farmland in the ROW	acres	5.6	4.5
Prime Farmland Under Specific Conditions in the ROW	acres	30.5	17.3
Wildlife and Habitat			
Tree clearing required in the ROW (based on field survey observation)	acres	11.2	2.8
Pasture/rangeland crossed within 1,000 feet (based on NLCD data)	percent	2.5	1.3

5.2 Human Environment

Land use considerations may include direct and indirect effects on residential, commercial, and industrial development, institutional uses (e.g., schools, places of worship, cemeteries, and hospitals), cultural resources, and land use. Construction of a new transmission line can result in changes in land use and aesthetic impacts to residents, commuters and travelers, employees, and recreational users. A comparison of the land use considerations for the Route Alternatives is presented at the end of this section in **Table 2.** Land use within the Study Area is shown on **Map 6.**

5.2.1 Existing and Proposed Developed Land Use

The human environment impacts may include direct and indirect impacts to residential, commercial, and industrial development, institutional uses (e.g., schools, places of worship, cemeteries, and hospitals), cultural resources, and land use. A RSS goal is to avoid or minimize conflicts with existing and proposed land uses that are not compatible with a new transmission line. A comparison of the human environment considerations for the Route Alternatives is presented at the end of this section in **Table 2.** Land use within the Study Area is shown on **Map 6, Attachment A.**

Resource Characteristics

The Study Area is located within Madison and Truro townships, Franklin County, Ohio. The Study Area contains the Census Designated Place ("CDP") of Blacklick Estates as well as portions of the Village of Brice and City of Columbus. As shown on **Map 6, Attachment A**, much of the Project Area is developed, ranging from open space/low to high intensity. Subdivided residential neighborhoods, such as Blacklick Estates, Crosscreek Village, Edgewater Park, Independence

[7] Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops.

Village, Shannon Green, Three Rivers, Walnut Heights, and Winchester, are generally concentrated southeast of I-270 and mixed-use commercial/industrial land use areas are generally concentrated to the north, adjacent to the southwest and southeast of the I-70/I-270 interchange. Additional commercial and industrial properties occur but at a lower density in the southwestern portion of the Study Area along OH-317 and Winchester Pike (CR 376). Agricultural land is generally confined to the southeastern portion of the Project area near the Shannon Station; however, recent residential development is visible within these areas on recent and current aerial imagery and site reconnaissance.

13 schools or academies are located within the Study Area:

- A+ Arts Academy [formerly known as ("FKA") Maybury Elementary School] – addressed 2633 Maybury Road, located approximately 0.5-mile northeast of Noe Bixby Road (CR 371) and Old Refugee Road (CR 14).
- Ashbury Elementary School – addressed 5127 Harbor Boulevard, distanced approximately 0.9-mile northwest of OH-317 and Winchester Pike (CR 376).
- Columbus Arts and Technology Academy – addressed 2255 Kimberly Parkway East, distanced approximately 0.3 mile southwest of Groves Road (CR 510) and South Hamilton Road (OH-317).
- Dunloe Elementary School – addressed 3200 Dunloe Road, distanced approximately 0.4 mile southeast of Refugee Road (CR 14) and Noe Bixby Road (CR 371).
- Eastland Performance Academy – addressed 2220 South Hamilton Road (OH-317), located adjacent southeast of OH-317 and Groves Road (CR 510).
- First Class Driving Academy – addressed 3456 South Hamilton Road (OH-317), distanced approximately 0.3 mile north of Winchester Pike (CR 376) and OH-317.
- Groveport-Madison Middle School – addressed 5474 Sedalia Drive, distanced approximately 0.8 mile southwest of Chatterton Road (CR 340) and Noe Bixby Road (CR 371).
- Independence High School – addressed 5175 Refugee Road, distanced approximately 0.6-mile northeast of Chatterton Road (CR 340) and Noe Bixby Road (CR 371).
- Liberty Elementary School – addressed 2901 Whitlow Road, located adjacent southeast of Independence High School.
- Little Scholars Club Early Childhood Development Center (FKA Lindora Children's Academy) – addressed 5000 Lindora Road, distanced approximately 0.4-mile northeast of Noe Bixby Road (CR 371) and Old Refugee Road (CR 14).
- Madison Elementary School – addressed 4600 Madison School Drive, located approximately 0.6 mile southeast of South Hamilton Road (OH-317) and Refugee Road (CR 14).

- Sedalia Elementary School – addressed 5400 Sedalia Drive, located adjacent west of Groveport-Madison Middle School.
- Zenith Academy East – addressed 2261 South Hamilton Road (OH-317).

Two cemeteries and 11 places of worship are within the Study Area:

- Asbury South United Methodist Church – addressed 4760 Winchester Pike (CR 376).
- Asbury Methodist Episcopal Cemetery is located adjacent south across Winchester Pike.
- Brice United Methodist Church – addressed 3160 Brice Road (CR 117), distanced approximately 0.1-mile northeast of Chatterton Road (CR 340).
- Ebenezer Baptist Church – addressed 4500 Refugee Road, distanced approximately 0.3-mile northwest of the intersection of Refugee Road (CR 14) and South Hamilton Road (OH-317).
- Faithway Baptist Church – addressed 3001 Brice Road (CR 117), located adjacent southwest of the intersection of Brice Road and Old Refugee Road (CR 14).
- Fellowship Baptist Church – addressed 4701 Winchester Pike, located adjacent west of Asbury Methodist Episcopal Cemetery.
- Gethsemane United Methodist Church – addressed 5081 Carbondale Road, distanced approximately 0.5-mile northeast of Noe Bixby Road (CR 371) and Old Refugee Road (CR 14).
- Iglesia tabernáculo de fuego (Church) – addressed 2234 South Hamilton Road (OH-317), distanced approximately 0.1-mile southeast of the intersection of OH-317 and Groves Road (CR 510).
- Meeting Point Ministries Church – addressed 2866 Noe Bixby Road (CR 371), distanced approximately 0.2-mile north of the intersection of Noe Bixby Road and Old Refugee Road (CR 14).
- New Faith Church – addressed 2879 Brice Road (CR 117), distanced approximately 0.1-mile north of the intersection of Brice Road and Old Refugee Road (CR 14).
- Our Lady of the Miraculous Medal Church – addressed 5225 Refugee Road (CR 14), located adjacent east of Independence High School.
- Truro Cemetery is located approximately 320 feet southeast of the intersection of Noe Bixby Road (CR 371) and Refugee Road (CR 14).
- Watpa Thavone Dhammaram (Buddhist Temple) – addressed 5810 Shannon Road (CR 118), distanced approximately 0.1-mile north of the Shannon Station.

Open space, recreational parks, and easements are common throughout the Project area, especially along riparian corridors and floodplains of Big Walnut Creek, Blacklick Creek, and Mason Run (see **Attachment A, Map 1**). As previously described above in **Section 3.2**, 12 City of

Columbus parks and three park easements are located along the Big Walnut Creek corridor in the western portion of the Study Area; five parks and two park easements are present along the Blacklick Creek corridor in the eastern portion of the Study Area; as well as one park and one park easement along the Mason Run corridor in the southwestern portion of the Study Area. The Blacklick Creek Trail also traverses the southeastern portion of the Study Area, providing walking and biking paths adjacent to Blacklick Creek. Three additional locally or privately owned parks identified within the northern portion of the Study Area.

An active Norfolk Southern railroad runs along the northern boundary of the Study Area, which has smaller spurs splitting off to industrial properties north and east of the Groves Road Station. No inactive railroads, active or abandoned quarries, or active or abandoned mines are within the Study Area. Two FCC towers are within the northeastern portion of the Study Area (Eastland), which are generally located between Groves Road and I-70. One additional FCC tower was identified in the southwestern portion of the Study Area, along the eastside of OH-317 and approximately 0.5 mile south of Refugee Road (CR 14). One private helipad is within one mile of Route Alternative A, distanced approximately 0.16-mile northwest of Brice Road (CR 117) and I-70. No pipelines were identified on the National Pipeline Mapping System (NPMS); however, during the public communications and open house period (see **Section 3.6.1**), landowners confirmed the presence of a high-pressure gas line along the southside of Winchester Pike (CR 376). No active or abandoned oil/gas wells were identified within the Study Area.

Route Alternative Comparison

Land uses along the routes were identified based on a desktop review of aerial imagery and USFWS National Land Cover Database ("NLCD") coverage, in addition to field site reconnaissance. Route Alternative A is primarily composed of mixed-use commercial/industrial land uses from Groves Road Station to the Shannon – Astor 138 kV transmission line. Residential, recreational, or agricultural land uses dominate the rebuild area along the existing Shannon – Astor 138 kV transmission line. Route Alternative B is primarily located near residential, recreational, and forested land use areas where it is parallel to the existing Bixby – Groves Road 138 kV transmission line. The remainder of Route Alternative B primarily parallels Winchester Pike (CR 376) or Shannon Road (CR 118) and thus is primarily composed of residential and mixed-use commercial/industrial land uses, with smaller amounts of agricultural or recreational land uses.

The Siting Team previously noted that Route Alternative A is in proximity to denser populated areas when compared to Route Alternative B. As shown in **Table 2**, Route Alternative A subsequently crosses more parcels (123) and more landowners (86), while Route Alternative B crosses almost half as many (54 and 40, respectively). It is worthy to note, however, that 87 of the 123 parcels and 64 of the 86 landowners are currently crossed by the Shannon – Astor 138 kV Transmission Line ROW. Route Alternative A also contains more single-family and multi-family

dwellings within 100 feet and more single-family dwellings within 250 feet of the centerline compared to Route Alternative B. Route Alternative A also contains two outbuildings and a walk up restaurant within the 60-foot ROW, while Route Alternative B contains none. Neither route contains any single-family or multi-family dwellings within the 60-foot ROW.

Overall, Route Alternative A is longer and generally in closer proximity to developed land uses compared to Route Alternative B; however, it is within an existing, maintained 138 kV ROW for almost half its length. Route Alternative B is within an existing, unmaintained 138 kV ROW for less than half of its length. Neither alternative cross any protected land identified in PADUS. The land use impacts of both routes are generally mitigated by paralleling and rebuilding existing infrastructure for the majority of their alignments.

Table 2. Land Use Evaluation Criteria

Route Alternative	Unit	A	B
General			
Length	miles	6.6	5.2
Number of parcels[8] crossed by ROW	count	123	54
Landowners crossed by ROW	count	86	40
Residential			
Barns, Outbuildings, Sheds, Garages and silos in the ROW (excludes abandoned features)	count	2	0
Single-Family Dwellings within 100 feet of the Centerline	count	18	0
Multi-Family Dwellings within 100 feet of the Centerline	count	10	0
Single-Family Dwellings within 250 feet of the Centerline	count	236	132
Multi-Family Dwellings within 250 feet of the Centerline	count	31	43
Commercial/Industrial			
Commercial/Industrial Buildings within the ROW	count	1	0
Commercial/Industrial Buildings within 250 feet of the Centerline	count	50	18
Railroads Paralleled	miles	2.3	0
Community/Recreational Facilities			
Schools within 500 feet of the Centerline	count	1	0
Places of Worship within 500 feet of the Centerline	count	5	3
Cemeteries within 500 feet of the Centerline	count	0	1
City of Columbus Park Easements within the ROW	acres	0	0.03
City of Columbus Park Properties within the ROW	acres	1.1	0

[8] The number of parcels crossed refers to the number of individual plots of owned land recorded by each County. The number of landowners within the ROW represent the number of individual landowners, who each may own one or more parcels.

Table 2. Land Use Evaluation Criteria			
Route Alternative	**Unit**	**A**	**B**
City of Columbus Parks within 500 feet of the Centerline	count	5	6
Protected Land			
No protected lands crossed by the ROW			
Agriculture and Forestry			
Pasture/rangeland and cropland in the ROW (based on NLCD data)	acres	7.9	3.6
Forested land cover in the ROW (based on field survey observation)	acres	11.2	2.8
Cultural Resources			
NRHP-eligible architectural sites within 0.25 mile of the centerline	count	0	1
Known architectural sites within 0.25 mile of centerline*	count	14	7
NRHP-eligible architectural sites within one mile of the centerline	count	0	1
Known architectural sites within one mile of centerline*	count	38	27
Known archaeological sites within the ROW*	count	0	3
Known archaeological sites within 0.25 mile of the centerline*	count	4	36

*known architectural and archaeological sites do not have a designated status and therefore could not be dismissed at this time, as potentially NRHP-eligible.

5.2.2 Agricultural and Forestry Resources

Resource Characteristics

Agricultural land use is generally limited to the southeastern portion of the Study Area (**Map 6, Attachment A**). During construction there are potential impacts, but these are considered temporary, and agricultural production can continue after the new 138 kV transmission line is made operational. Impacts to agricultural land use can be ranked by general degree of potential impact, with less potential impact occurring in areas where cultivation is not the primary use (pastureland/grassland), followed by cultivated croplands, which have a higher degree of potential impact. Contiguous areas of forested cover are generally limited to the riparian corridors of Big Walnut Creek, Blacklick Creek, and Mason Run. Urban forestry is scattered throughout the Study Area in smaller amounts, primarily located along local roads and within subdivided residential areas. According to publicly accessible data, none of the forested areas consists of federal or state forested lands, as most appear to be reserved for either recreational areas or screening between agricultural fields and residential neighborhoods.

Route Alternative Comparison

As shown above in **Table 2**, Route Alternative A crosses approximately 3.5 acres more agricultural land than Route Alternative B; however, the majority of these areas (concentrated north, east, and south of Shannon Station) are already impacted by the existing Shannon – Astor 138 kV Transmission Line ROW (see **Map 6, Attachment A**). Therefore, Route Alternative B proposes more new permanent impacts to agricultural properties. The route alternatives do not cross areas designated as agricultural easements or security areas based on the National Conservation Easement Database (NCED). Minimal vegetation clearing is required in agricultural areas and permanent impacts would be limited to the foundations of the structures and areas requiring permanent access roads. Access to these agricultural areas is adequate, as farm tracks and adjacent local roads are present. Furthermore, the terrain is flat, reducing complications related to construction on steep slopes. Design and engineering efforts will be made to reduce impacts to the agricultural fields by reducing the number of heavy angled structures, increasing span distances, and placing fewer structures in farm fields.

Neither of the route alternatives require crossing large areas of forested cover, given the dominant residential and mixed-use commercial/industrial land uses of the Study Area. As shown above in **Table 1**, Route Alternative A would require more tree clearing (11.2 acres), largely due to the northside of the railroad corridor. Route Alternative B significantly reduces impacts to forestry resources within the Study Area as it requires 2.8 acres of ROW tree clearing. Neither route alternative proposes new impacts to forestry resources within parks or easements designated by the City of Columbus or PADUS. Approximately 1.1 acres of Route Alternative A crosses the City of Columbus Chatterton Parkland; however, this area is already periodically maintained within the existing Shannon – Astor 138 kV Transmission Line ROW. If tree clearing would be required for the selected route, the cleared area would be maintained in accordance with AEP's Vegetation Management Program.

5.2.3 Aesthetic Impacts to Recreation and Conservation Lands

Resource Characteristics

As previously discussed throughout this report, recreational parks and conservation land are a dominant land use within the Study Area and are generally located either along riparian corridors and/or near subdivided residential neighborhoods (see **Attachment A, Map 5**). The City of Columbus Williams Park and Mason Run Parkland conservation easement are located within the southwestern portion of the Study Area, along Mason Run.

The following recreational or conservation areas or easements are located within the central portion of the Study Area along the Big Walnut Creek riparian corridor, listed from north to south:

- Sol Shenk Parkland – a City of Columbus conservation park
- Winding Creek – a City of Columbus conservation easement
- Deer Lake Parkland – a City of Columbus conservation park
- Catalpa Park – a City of Columbus park
- Nafzger Park – a City of Columbus park, also identified as a private-owned scenic area (PADUS)
- Noe Bixby Park – a locally owned park (PADUS)
- Amberfield Parkland – a City of Columbus conservation park
- Refugee Preservation Area – a City of Columbus conservation easement
- Refugee Preserve – a City of Columbus conservation park
- Big Walnut Creek Corridor – a City of Columbus conservation park
- Deems Parkland – a City of Columbus conservation park
- Helsel Park – a City of Columbus par, also identified as a locally owned scenic area (PADUS)
- Big Walnut-Edgewater Parkland – a City of Columbus conservation park

The following recreational or conservation areas or easements are located within the southeastern portion of the Study Area along the Blacklick Creek riparian corridor, listed from northeast to southwest:

- Shelbourne Parkland – a City of Columbus conservation park area, also identified as a locally owned park (PADUS)
- Chatterton Brice Parkland – a City of Columbus park
- Chatterton Parkland – a City of Columbus park
- Shannon Parkland – a City of Columbus conservation park
- Shannon Road – a City of Columbus park access easement
- M-Five Parkland – a City of Columbus conservation park and easement

In addition to the above-listed recreational areas, the City of Columbus and PADUS also identify Maybury Park and Walnut View Park within the Walnut Heights neighborhood of the northern portion of the Study Area.

Construction of transmission lines can have impacts on access to recreational areas by temporarily: (1) blocking access roads, trails, or other facility entrances; (2) closing roads during specific construction activities; (3) disrupting traffic; and (4) creating detours, possibly making access more difficult. The proposed transmission line will be supported on new, steel monopole structures with an average height of 90 feet above ground level. The topography within the Study Area is characterized as flat terrain. Existing topography and the relative location of a transmission line can affect the scenic integrity of the Project area. Scenic integrity refers to the

degree of intactness and wholeness of the landscape character. Routes that use or parallel existing transmission lines would generally result in fewer land use or aesthetic impacts than those that parallel roads, railroads, or require greenfield ROW.

Route Alternative Comparison

As shown above in **Table 2**, Route Alternative B has one more City of Columbus parks or easements within 500 feet of the proposed centerline (6) compared to Route Alternative A. Route Alternative B crosses within 30 feet of the southern-most portion of the existing City of Columbus' Shannon Road park easement, where the route is parallel to Shannon Road (CR 118) west of the existing Shannon Station. Route Alternative A proposes rebuilding approximately 3.1 miles of the Shannon – Astor 138 kV transmission line in maintained, existing ROW, of which approximately 0.2-mile (or 1.1 acres) crosses the City of Columbus Chatterton Parkland. Neither route crosses any protected land identified in PADUS. Route Alternative A is anticipated to result in fewer aesthetic impacts to recreational and conservation lands because it uses a maintained existing 138 kV transmission ROW and has less recreational and conservation areas within 500 feet of the proposed alignment.

Constructing greenfield transmission line adjacent to residences or commercial/industrial dwellings that do not currently have a view of an electrical line will result in new aesthetic impacts. Route Alternative A proposes approximately 3.1 miles of transmission line within existing 138 kV ROW and approximately 3.4 miles of greenfield transmission line, which parallels existing transportation ROW or parcel boundaries to the highest extent practicable. Route Alternative B proposes approximately 1.9 miles of transmission line within existing unmaintained ROW and 2.9 miles of greenfield transmission line, which parallels roads to the highest extent practicable.

Although Route Alternative A contains more single-family and multi-family dwellings within 100 feet of the proposed centerline and more commercial/industrial buildings and single-family dwellings within 250 feet of the proposed centerline, many of these properties already have a view of the existing Refugee – Groves Road or Shannon – Astor 138 kV transmission line. No homes are located within the proposed 60-foot ROW for either Route Alternative. The length of rebuild within existing maintained 138 kV ROW proposed for Route Alternative A is approximately 1.2 miles more than the 1.9 miles of transmission line parallel to existing 138 kV within existing unmaintained ROW proposed for Route Alternative B. The new structures needed for the rebuilt 138 kV transmission line will look different than the existing structures, as they would be double circuit, where they are now single circuit. It is important to note that if Route Alternative B was selected the Shannon-Astor 138 kV transmission would still need to be rebuilt as single-circuit line. Additionally, the existing railroad bed is raised and the southside of its corridor is primarily forested, reducing viewshed impacts to many of the residential and

commercial buildings within 100 and 250 feet of Route Alternative A. Therefore, Route Alternative B has the potential for more aesthetic changes to adjacent developed land use areas when compared to Route Alternative A.

5.2.4 Historic and Archaeological Resources

Resource Characteristics

Cultural resources generally refer to historic and prehistoric archaeological resources and historic architectural resources. Known architectural resources (i.e., historic buildings, structures, districts, and roads) in the vicinity of the Route Alternatives are shown on **Map 7**. Known archaeological resources are not shown on the figures in this study to protect any such sites.

Potential effects on historic properties would likely be primarily visual resulting from the construction of new structures and transmission line. The visual landscape change would vary based on local topography, height of existing vegetation, current infrastructure, and any intervening recent development. Physical impacts to historic architectural properties are not anticipated.

Initial analysis of the Project's potential to affect cultural resources involved a review of data provided by Ohio State Historic Preservation Office. There are 20 known architectural resources within the Study Area, one of which is eligible for the National Register of Historic Places (NRHP). Two cemeteries are present within the Study Area according to Ohio State Historic Preservation Office data; the Asbury Cemetery is identified as a historic cemetery.

Buried archaeological resources can generally be avoided as the poles can be sited to avoid specific sites and the impact footprint is small. Further, matting can be used during construction to protect any underground resources. Above-ground archaeological sites can also be avoided where possible. Where practical, archeological resources identified in the transmission line corridor, in the direct path of any needed access roads, or at the locations of proposed work areas will be avoided by spanning the resource or, if necessary, by shifting tower positions, re-routing roads, and reconfiguring or relocating work areas. Cultural resource surveys will be completed to identify and mitigate any resources found.

Route Alternative Comparison

No architectural sites are located within the ROW of the route alternatives. As shown above in **Table 2**, Route Alternative A does not contain any NRHP-eligible architectural sites within a one-mile buffer area of the proposed alignment; however, Route Alternative A contains more known architectural sites within 0.25 mile (14) and one mile of the proposed alignment (38). Route Alternative B contains one NRHP-eligible architectural site within 0.25 mile of its proposed

alignment. The Graham House, addressed 4680 Winchester Pike, is approximately 60 feet northeast of Route Alternative B (**Attachment A, Map 7**). Route Alternative B contains less architectural resources within 0.25 mile (7) and one mile of the proposed alignment (27).

As summarized above in **Table 2**, Route Alternative B contains more archaeological resources within 30 feet (3) and 0.25 mile of its proposed alignment (36). A total of 38 known archaeological resources were identified within 0.25 mile of the route alternatives, which are identified below in **Table 3**, with their distances listed in measurements of linear feet. Route Alternative A appears to present the more favorable option regarding cultural resources, as there are no nearby eligible architectural sites and no known archaeological resources crossed by the ROW. However, archaeological data should be treated with caution, as resources are only identified where they have been actual studies. Lack of recorded sites does not necessarily mean none are present. None of the identified archaeological resources have been determined to be NRHP-listed, eligible, or potentially eligible at this time. AEP Ohio Transco may conduct further evaluations for the Preferred Route to determine the eligibility and impacts to these resources.

Table 3. Archaeological Resources within 0.25 mile

Resource No.	Distance from Route A	Distance from Route B	NRHP Status
FR0128	> 0.25 mile	40 feet	Unknown
FR0129	> 0.25 mile	Crossed by Route	Unknown
FR0130	> 0.25 mile	300 feet	Unknown
FR0131	> 0.25 mile	150 feet	Unknown
FR0132	> 0.25 mile	380 feet	Unknown
FR0133	> 0.25 mile	170 feet	Unknown
FR0134	> 0.25 mile	Crossed by Route	Unknown
FR0135	> 0.25 mile	Crossed by Route	Unknown
FR0136	1,100 feet	150 feet	Unknown
FR0137	> 0.25 mile	750 feet	Unknown
FR0419	630 feet	> 0.25 mile	Unknown
FR0420	520 feet	> 0.25 mile	Unknown
FR1650	> 0.25 mile	1,280 feet	Unknown
FR1651	> 0.25 mile	1,150 feet	Unknown
FR1652	> 0.25 mile	1,040 feet	Unknown
FR1653	> 0.25 mile	960 feet	Unknown
FR1654	> 0.25 mile	850 feet	Unknown
FR1655	> 0.25 mile	870 feet	Unknown
FR1656	> 0.25 mile	720 feet	Unknown
FR1657	> 0.25 mile	650 feet	Unknown
FR1658	> 0.25 mile	810 feet	Unknown
FR1659	> 0.25 mile	600 feet	Unknown
FR1660	> 0.25 mile	570 feet	Unknown
FR1661	> 0.25 mile	520 feet	Unknown

Table 3. Archaeological Resources within 0.25 mile			
Resource No.	**Distance from Route A**	**Distance from Route B**	**NRHP Status**
FR1662	> 0.25 mile	450 feet	Unknown
FR1663	> 0.25 mile	550 feet	Unknown
FR2044	> 0.25 mile	210 feet	Unknown
FR2045	> 0.25 mile	350 feet	Unknown
FR2088	> 0.25 mile	890 feet	Unknown
FR2089	> 0.25 mile	380 feet	Unknown
FR2091	> 0.25 mile	720 feet	Unknown
FR2297	> 0.25 mile	860 feet	Unknown
FR2298	> 0.25 mile	760 feet	Unknown
FR2299	> 0.25 mile	630 feet	Unknown
FR2300	> 0.25 mile	270 feet	Unknown
FR2443	> 0.25 mile	530 feet	Unknown
FR2539	> 0.25 mile	220 feet	Unknown
FR2907	530 feet	530 feet	Unknown

5.2 Constructability

Potential engineering and construction challenges are important to consider when routing a transmission line. Major factors that affect constructability include, but are not limited to, condensed ROWs, sharp turn angles, existing infrastructure, distance, and safety. These are all elements that could require extensive or non-standard engineering and lead to increases in impacts and overall cost. A comparison of the engineering and construction considerations for the Route Alternatives is presented at the end of this section in **Table 4**.

5.2.1 Engineering

Land features and characteristics that require more complicated design or construction are considered engineering constraints. These include elements of the terrain (slope, valleys/waterbodies requiring long spans), nearby communication towers, access for construction and maintenance, route turns that require more robust angle structures, and crossing of non-compatible land uses, or those needing supplemental engineering design (e.g., crossing other high-voltage transmission lines). Engineering constraints often need to be considered from multiple perspectives, since some impacts may be offset by other benefits. For example, paralleling existing infrastructure and crossing over/under transmission lines, distribution lines, and pipelines can require specialized construction techniques and scheduled outages on the existing lines. At the same time, paralleling existing infrastructure like roads and transmission lines can also reduce access road construction needs and can reduce overall right of way acquisition.

Overall, AEP Ohio Transco attempted to minimize route length and ROW acquisition by paralleling existing 138 kV transmission line or rebuilding existing 138 kV transmission line, both within existing ROW. As previously described in **Section 3.2**, there are three existing AEP-owned 138 kV transmission lines traversing the Study Area: Astor – Shannon, Bixby – Groves Road, and Refugee – Groves Road, all of which presented suitable siting opportunities for the Project. Two additional AEP-owned 40 kV transmission line and one additional AEP-owned 138 kV transmission line cross the northwestern-most portion of the Study Area, connecting to Groves Road Station; however, these transmission lines were not identified as suitable siting opportunities for the Project due to their direction and location.

Approximately 3.2 miles of the Refugee – Groves Road 138 kV transmission line will be retired as a result of the Project, regardless of the selected route. Paralleling the existing Bixby – Groves Road 138 kV transmission line within existing ROW was identified as a routing opportunity, in addition to rebuilding portions of the existing Refugee – Groves Road and Shannon – Astor 138 kV transmission lines within existing ROW. Approximately 2.8 miles of double-circuit transmission line is anticipated for Route Alternative A and approximately 0.1 miles of double-circuit transmission line is anticipated for Route Alternative B. Regardless of the route chosen, the Project will require the outage of the Shannon – Astor 138 kV Transmission Line since both route alternatives propose some amount of double circuit rebuild of Shannon – Astor; however, the outage for Route Alternative A would be longer.

Major transport corridors in the area include I-270, which runs northeast to southeast through the western half of the study area, as well as OH-317, which travels north to south. Central portions of the Study Area are crossed by Noe Bixby Road (CR 371), which travels north to south, as well as Refugee Road (CR 14) and Chatterton Road (CR 340), which run east to west. Groves Road (CR 510) and an active Norfolk Southern-owned railroad both travel in a general east to west direction within the northern portion of the Study Area; Brice Road (CR 117) runs north to south within the eastern portion of the Study Area, and Winchester Pike (CR 376) and Shannon Road (CR 118) are within the southern portion of the Study Area, which both travel in a general east to west fashion. Additional smaller township or municipal roads are visible throughout residential and mixed-use commercial/industrial land use areas of the Study Area. The Siting Team noted several opportunities to parallel existing major and local transportation corridors, including Groves Road (CR 510), Cloverleaf Street, Refugee Road (CR 14), the Norfolk Southern railroad, Shannon Road (CR 118), and Winchester Pike (CR 376). The Siting Team also sought to minimize the number of highway or railroad crossings to the highest extent practicable.

Three existing communications towers are located within the western half of the Study Area: two are within the northwestern portion, within 0.75 mile northeast of the Groves Road Station, and one is within the southwestern portion, approximately 0.5-mile north of Winchester Pike (CR

376) and South Hamilton Road (OH-317). Based on their locations the communication towers did not affect the placement of route alternatives (see **Attachment A, Map 1**). According to landowner input (see **Section 3.6.**4), a high-pressure gas line runs along the southside of Winchester Pike (CR 376), which was considered during the development of Route Alternative B.

No terrain constraints or geological hazards were identified in the study area.

Route Alternative Comparison

Paralleling existing straight roads can provide opportunities to reduce the number of angled structures. However, in some cases, paralleling road can also conflict with existing aboveground and underground utilities, bridges, and building clearances. Furthermore, not all roads are straight, and following roads that change direction and frequent requirements to cross to the other side of the road to avoid structures significantly increase the number of more expensive angle structures and greater land use impacts.

As shown below in **Table 4**, Route Alternative B parallels existing local roads (Winchester Pike and Shannon Road) for a greater extent (2.7 miles) than Route Alternative A. During the public open house (see **Section 3.6.4**), landowners indicated that an underground high-pressure gas line is located adjacent south of Winchester Pike. Landowners along the northside of Winchester Pike between OH-317 and Noe Bixby Road (CR 371) also indicated that underground telecommunication lines were recently installed along the northside of Winchester Pike. These landowner-provided locations of underground utilities are likely to negatively affect the constructability of Route Alternative B.

Although railroads can present siting constraints for transmission line projects, such as additional permitting requirements, fees, or studies, the Siting Team considered paralleling the northside of the Norfolk Southern railroad as a siting opportunity to reduce potential aesthetic changes to nearby residences. Route Alternative A requires one railroad crossing at Cloverleaf Street to parallel the northside of the railroad for approximately 2.3 miles before requiring an additional railroad crossing at Brice Road to continue southward. Route Alternative B does not cross or parallel an existing railroad.

As shown below in **Table 4**, both alternatives cross I-270 once, OH-317 once, and eleven (11) local roads. Route Alternative B does not cross any railroads but would require two high-voltage ("HV") transmission line crossings: one crossing of the existing Bixby – Groves Road 138 kV transmission line south of the Groves Road Station is required to parallel the westside of Bixby – Groves Road 138 kV within existing, unmaintained ROW and a second crossing of the Bixby – Groves Road 138 kV is required at Winchester Pike (CR 376) to route southeastward parallel to the road. Route

Alternative A would not require any existing HV transmission line crossings for its proposed alignment.

Each alternative crosses a few large agricultural properties in the southeastern portion of the Study Area. Based on the availability of existing farm tracks and adjacent local roads in this area, no access concerns were identified. It is possible that longer spans and access from existing dirt roads may reduce the number of access roads required.

Both alternatives either parallel existing transportation corridors and parallel or rebuild existing linear transmission infrastructure within existing ROW for the majority of their alignment. Based on preliminary engineering, Route Alternative B is the shortest route (5.2 miles) and requires substantially fewer heavy angle structures (greater than 45°) than Route Alternative A (**Table 4**). Still, Route Alternative A presents a more favorable option regarding constructability criteria, as it involves more rebuild within maintained 138 kV transmission line ROW. Additionally, Route Alternative A does not require any existing HV transmission line crossings by using maintained 138 kV transmission line ROW for approximately 3.1 miles and requiring approximately 2.8 miles of double-circuit 138 kV transmission line along the Shannon – Astor rebuild portion of its alignment.

Table 4. Constructability Evaluation Criteria			
Route Alternative	**Unit**	**A**	**B**
General			
Total Length	miles	6.6	5.2
Single Circuit 138 kV Length	miles	3.8	5.1
Double Circuit 138 kV Length	miles	2.8	0.1
Total 60-foot ROW	acres	48.3	37.5
Greenfield ROW	acres	21.3	27.3
Transportation Resources			
Interstate Highways Crossed	count	1	1
State Highways Crossed	count	1	1
Local Roads and Streets Crossed	count	11	11
Railroad Crossed	count	2	0
Utility Resources			
Existing 138 kV Transmission Line Crossings	count	0	2
Heavy angles, greater than 45°	count	26	10
Rights-of-Way Parallel/Rebuild			
Existing 138 kV Parallel (within existing, unmaintained ROW)	miles	0	1.9
Existing 138 kV Rebuild (within existing, maintained ROW)	miles	3.1	0.3
Road Parallel	miles	0.7	2.7
Railroad Parallel	miles	2.3	0
Parcel Boundary Parallel	miles	0.3	0
Total length paralleled	miles	6.3	4.9
Total percentage paralleled	percent	96%	96%

5.2.2 Topographic and Geotechnical

Topography in the Study Area is relatively flat. The Study Area is within the Ohio Shale, which is characterized by a black-shale, carbonaceous to clayey laminated to thin bedded, fissile parting, carbonate and/or siderite concretions in the lowermost 50 feet, petroliferous odor, ranging 250 to 500+ feet thick (USGS, n.d.)[9]. Ohio Shale is not characterized by karst and no significant geologic hazards were identified. No sinkholes, mines, or quarries are located within the Study Area.

Route Alternative Comparison

From a topographic and geotechnical perspective, both routes cross similar conditions. Since the landscape is generally flat with no sinkholes, mines, or quarries present within the Study Area.

[9] U.S. Department of the Interior, United States Geologic Survey (USGS), n.d. Geologic maps of US states. Retrieved on December 21, 2021 from: https://mrdata.usgs.gov/geology/state/

5.2.3 Access Roads

Permanent access roads are not anticipated for the Project. Access to routes across agricultural fields could pose a challenge if conditions become wet, compared to access across those same fields to routes that parallel local road. In some cases, existing dirt access roads and local roads may require improvements to accommodate construction equipment. Permanent and temporary earth disturbance may require appropriate National Pollutant Discharge Elimination System (NPDES) and other permits with federal, state, and local jurisdictions.

Route Alternative Comparison

Proximity to existing roads is important for construction access and future maintenance. Given the predominant developed land uses within the Study Area, both route alternatives traverse areas with adjacent local roads suitable for access for the majority of their alignment. As previously mentioned above in **Section 5.2.1**, both route alternatives cross agricultural properties in the southeastern portion of the Study Area; however, there are several existing dirt or gravel tractor paths suitable for structure access. Several wetlands and streams were field delineated within the unmaintained portion of the 200-foot-wide Bixby – Groves Road 138 kV Transmission Line corridor, which could require possibly longer access roads as this area is more remote without existing maintained roads in close proximity. Overall, Route Alternative A is most favorable for suitable access, as it proposes more rebuild in maintained 138 kV transmission line ROW.

5.2.4 Right-of-Way

During the conceptual route development phase of the Project, existing compatible linear ROWs (roads, electrical transmission lines, and property boundaries) were identified and utilized or paralleled when feasible. From an engineering/construction perspective, advantages to utilizing or paralleling these features typically include readily available access for construction and maintenance and limited additional conflicts with airfields and airport airspace. At the same time, long parallel alignments and/or multiple crossings of other high-voltage transmission lines can increase the potential for localized severe weather events to damage both lines, or damage one line in a manner that forces outages on both lines.

Route Alternative Comparison

Both Route Alternatives require a 60-foot-wide ROW. As shown above in **Table 4**, Route Alternative B requires less amount of new ROW (21.3 acres), and Route Alternative A requires more (27.3 acres). Route Alternative A uses maintained 138 kV transmission ROW for approximately 3.1 miles and Route Alternative B parallels the existing Bixby – Groves Road 138 kV transmission line within unmaintained ROW for approximately 1.9 miles. Route Alternative A

contains more outbuildings (2) and commercial buildings (1) within the ROW. The commercial structure is within the existing Shannon – Astor 138 kV Transmission Line ROW and has been deemed an allowable encroachment by the Company's Engineering and ROW departments. One outbuilding is located on residential property and would be removed. The second outbuilding is a maintenance shed located in the Norfolk Southern railroad corridor and the Preferred Route would be designed around the feature.

The proposed ROW for Route Alternative A also crosses more parcels (130) and more landowners (86); however, the majority of these parcels and landowners are already impacted by the Shannon – Astor 138 kV Transmission Line Project, which would need to be rebuilt as part of the larger Southeast Columbus Area Project regardless, as mentioned above in **Section 5.2.3**. Neither route alternative contains residential dwellings within the ROW.

5.2.5 Operation, Maintenance, and System Considerations

Paralleling existing transmission lines is regarded as a routing opportunity but crossing other high voltage transmission lines presents a routing constraint. Crossing HV transmission can pose reliability concerns and require potential higher structures, which could require additional coordination with the FAA. After reviewing the three existing 138 kV transmission lines in the Study Area: Bixby – Groves Road (north to south within the western portion), Refugee – Groves Road (northwest to southeast in the northern portion), and Shannon – Astor (north to south in the eastern portion), the Siting Team identified suitable rebuild opportunities for portions of the Shannon – Astor and Refugee – Groves Road 138 kV transmission line and suitable paralleling opportunities for the Bixby – Groves Road 138 kV transmission line within the existing AEP-owned 200-foot-wide easement.

For human environment criteria, paralleling existing railroad corridors is considered an opportunity to reduce viewshed impacts; however, paralleling active railroads often requires additional permitting requirements, fees, or studies which may constrain the Project construction schedule. Based on landowner-provided information (see **Section 3.6.4**), an underground high-pressure gas line passes through the southern portion of the Study Area, adjacent south of Winchester Pike (CR 376). No other infrastructure exists within the Study Area that the Siting Team deemed viable for parallel.

Route Alternative Comparison

As previously mentioned, the Shannon – Astor 138 kV Transmission Line will experience an outage regardless of the selected route. Route Alternative A uses maintained 138 kV transmission line ROW for approximately 3.1 miles and would require approximately 2.8 miles of double-circuit 138 kV transmission line along the Shannon – Astor rebuild portion of its alignment. However, Route Alternative B would only require approximately 0.1 miles of double

circuit with the Shannon-Astor 138 kV Transmission Line, which would require a shorter outage on the line. In addition, Route Alternative B requires one existing transmission line crossing over the Bixby – Groves Road 138 kV transmission line in order to parallel Winchester Pike (376). The southern portion of Route Alternative B that parallels the southside of Winchester Pike (CR 376) may encounter the existing underground high-pressure gas line. Overall, Route Alternative B presents less favorable option regarding reliability concerns from a high-voltage transmission line perspective.

6.0 IDENTIFICATION OF THE PREFERRED AND ALTERNATE ROUTE

At the beginning of this report, AEP's stated goal was to find a Preferred Route and Alternate Route for the Project, per the OPSB application requirements. The Preferred Route presents the Route Alternative that minimizes potential impacts on the natural and human environment while avoiding indirect routes, unreasonable costs, and special design requirements. However, in practice, it is not usually possible to minimize all potential impacts at all times.

AEP Ohio Transco conducted a routing study and collected, reviewed, and interpreted information before even beginning to generate potential routes. Although a majority of the route segments proved to be viable, there were noteworthy differences between the proposed options. The rationale presented below is derived from the accumulation of the routing decisions made throughout the process, the local knowledge and experience of the Siting Team, input provided by landowners and stakeholders, and the comparative analysis of potential impacts presented in **Section 4.0**.

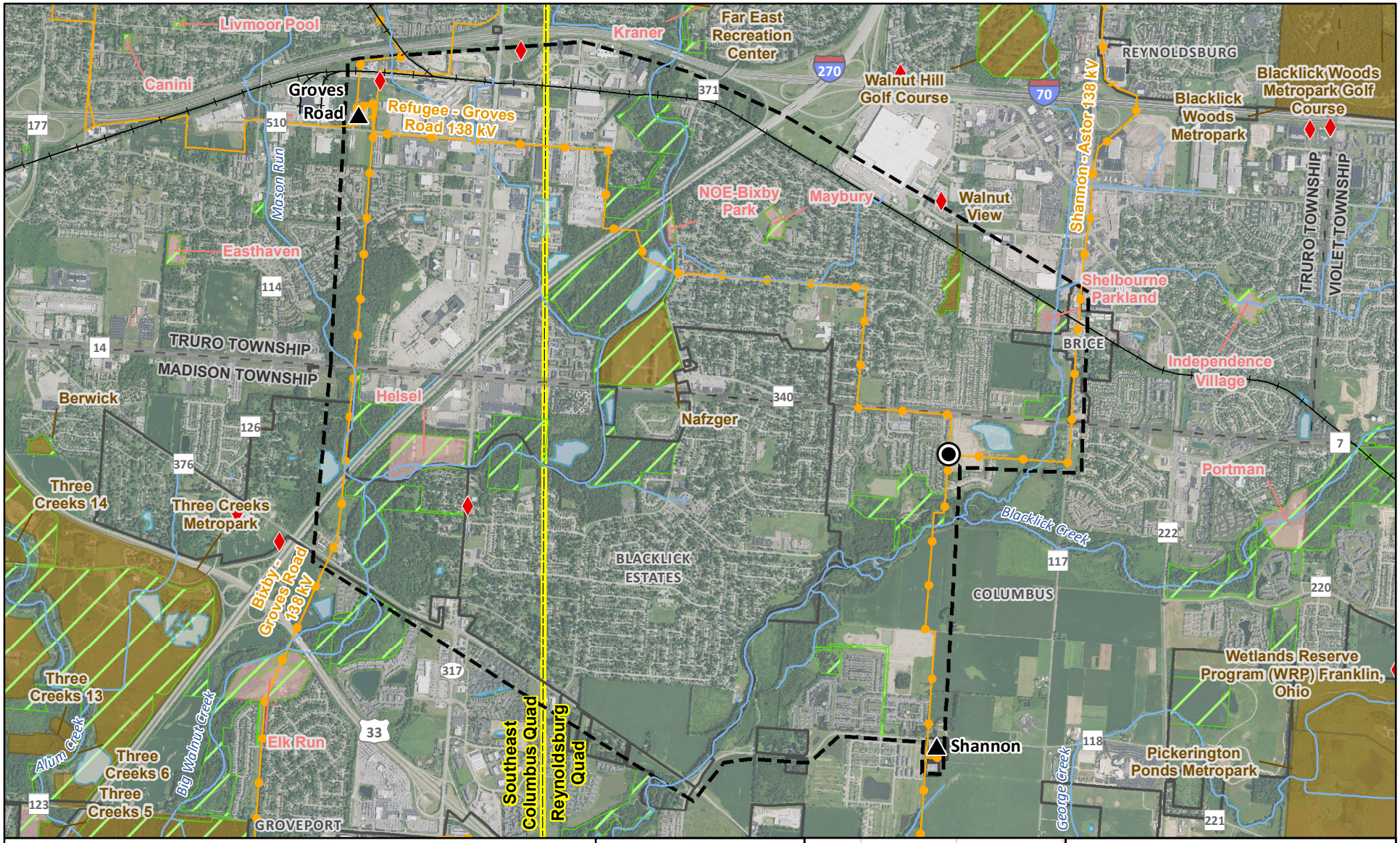
Based on the data gathered, route development, and the comparative analysis process completed to date, the Routing Team identified **Route Alternative A as the Preferred Route**, as shown in **Map 8**, **Attachment A**. Route Alternative B is identified as the **Alternate Route.**

- Route A minimizes effects on existing buildings, visual aesthetics, and existing aboveground and underground utilities, thereby reducing overall effects on the natural and built environments, for the following reasons:
    - Route A proposes rebuilding within existing maintained 138 kV transmission ROW to the highest extent practicable.
    - Route A parallels the northside of an existing railroad corridor for 2.3 miles. The existing railroad bed is raised and the southside of its corridor is primarily forested, which will reduce viewshed impacts to many of the residential and commercial buildings within 100 and 250 feet of Route Alternative A.
    - Route A reduces effects on existing residential and commercial properties, as most parcels and landowners crossed by the Route A ROW are currently impacted by the Company's Shannon – Astor 138 kV Transmission Line ROW.
- Route A presents a more favorable option for overall constructability because it does not require any high-voltage transmission crossings and proposes rebuilding within existing maintained 138 kV transmission ROW to the highest extent practicable.

- Route A proposes to rebuild 2.8 miles of the existing Shannon – Astor 138 kV Transmission Line, which needs to be rebuilt as part of the larger Southeast Columbus Area Improvements.

Although all routes are constructible, based on the comparison conducted for this Route Selection Study, AEP Ohio Transco believes the Preferred Route is (1) most consistent with the siting guidelines; (2) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner.

Attachment A: Maps



Station
Refugee Switch
FCC Tower
Railroad

Existing Transmission Line

69 kV and below
138 kV

NHD Stream or River
Study Area
NHD Waterbody
Municipal Boundary
Township Boundary
USGS Quad Boundary

City of Columbus Park Boundary or Easement

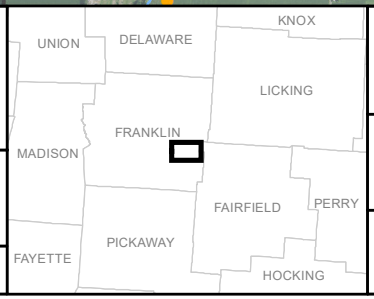
PADUS

Private or Regional Agency Special District
Local Government

Data Sources:
Census Boundaries (ESRI 2021)
NHD & PADUS (USGS 2021)
Topo Quads (USGS 2013)
Transmission (AEP 2017)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

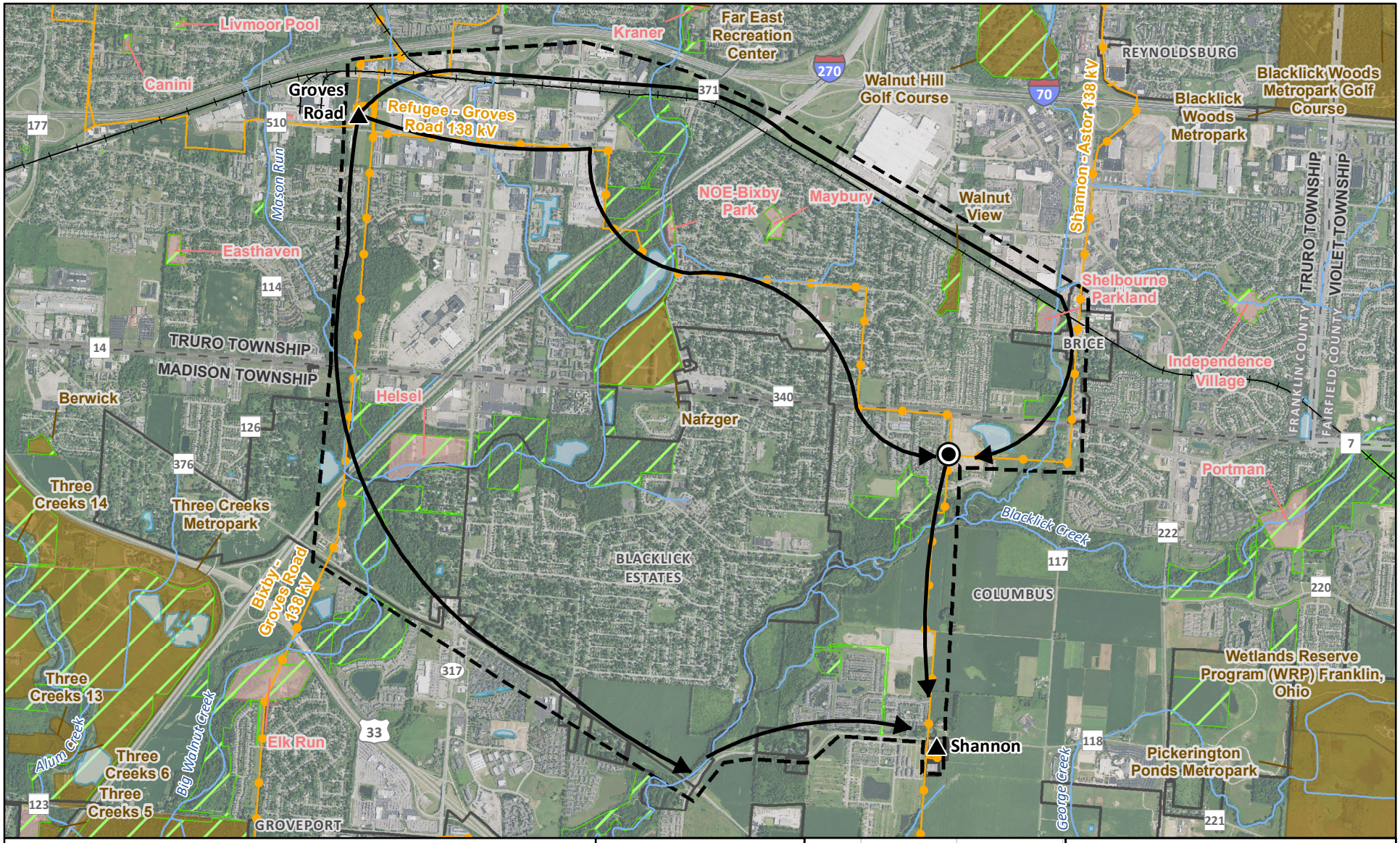


Map 1
Study Area

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.55 1.1
Miles



Station
Refugee Switch
Railroad
Conceptual Route

Existing Transmission Line

69 kV and below
138 kV
NHD Stream or River
Study Area
NHD Waterbody
Municipal Boundary
Township Boundary
County Boundary
City of Columbus Park Boundary or Easement

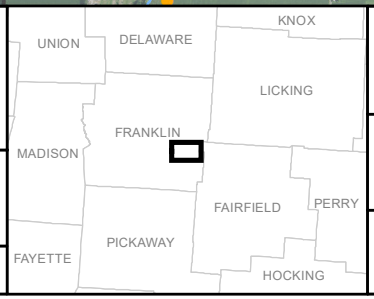
PADUS

Private or Regional Agency Special District
Local Government

Data Sources:
Census Boundaries (ESRI 2021)
NHD & PADUS (USGS 2021)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

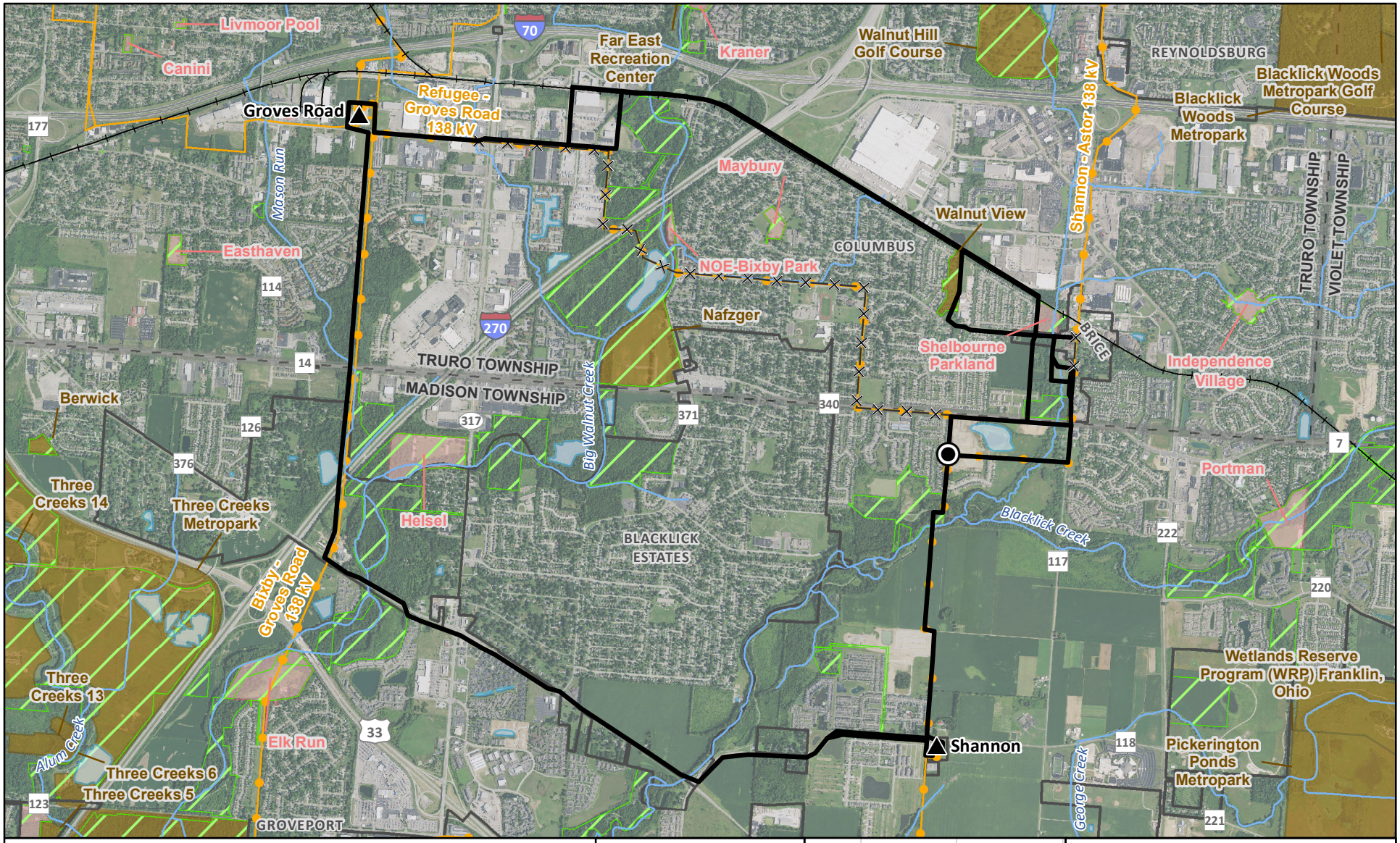


Map 2
Conceptual Routes

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.55 1.1
Miles



- Station
- Refugee Switch (to be removed)
- Railroad
- Preliminary Study Segment
- Existing Transmission to be Retired

Existing Transmission Line

- 69 kV and below
- 138 kV
- NHD Stream or River
- NHD Waterbody
- Municipal Boundary
- Township Boundary

- City of Columbus Park Boundary or Easement

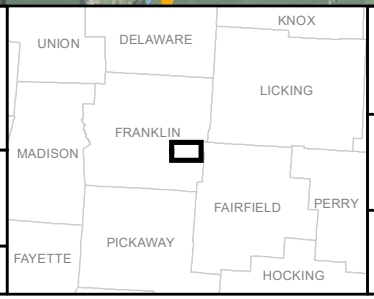
PADUS

- Private or Regional Agency Special District
- Local Government

Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NHD & PADUS (USGS 2021)
Transmission (AEP 2017)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

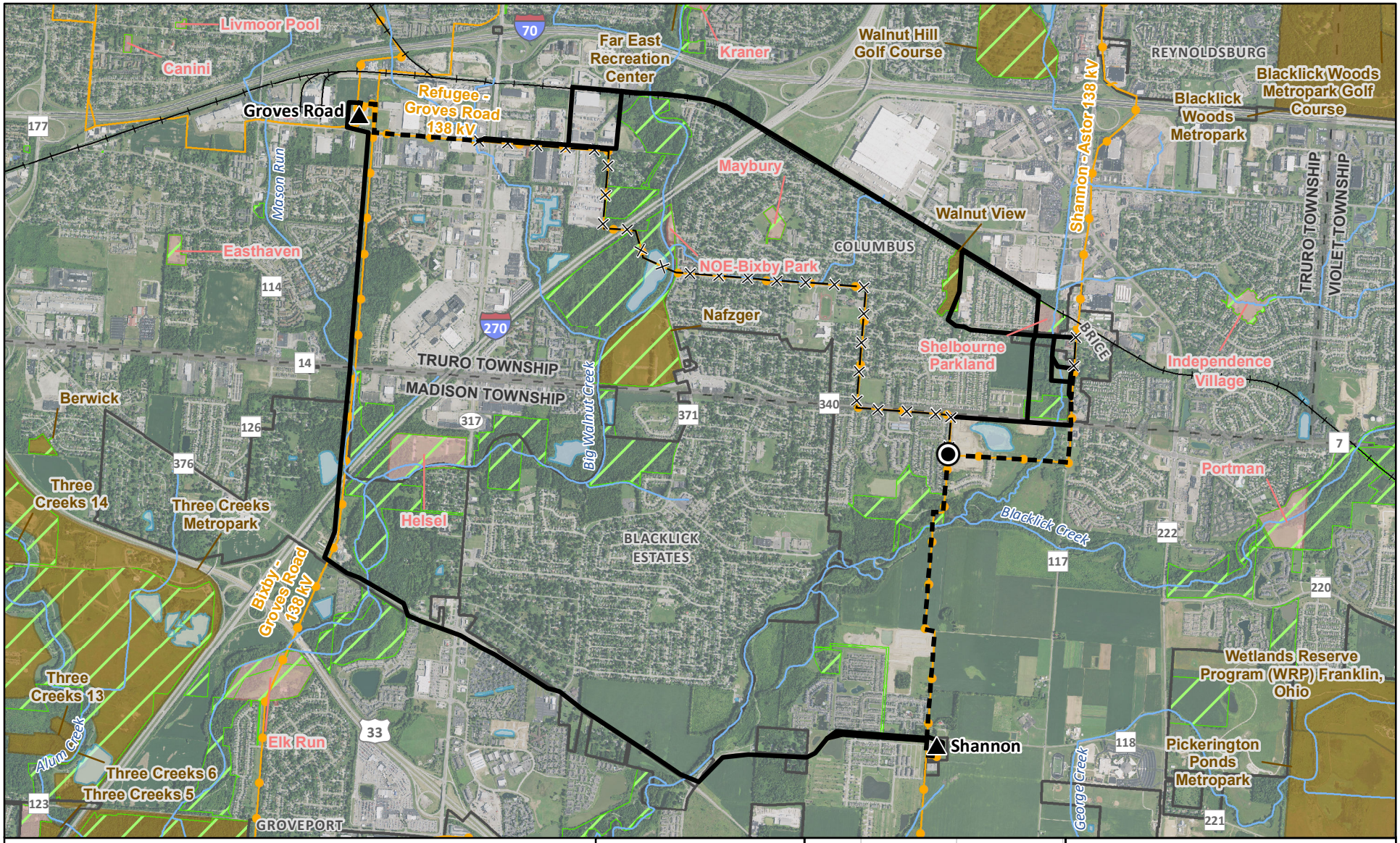


Map 3a
Preliminary Study Segment Network

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.55 1.1
Miles



- Station
- Refugee Switch (to be removed)
- Railroad
- Existing Transmission to be Retired
- Greenfield Study Segment
- Rebuild Study Segment

Existing Transmission Line

- 69 kV and below
- 138 kV
- NHD Stream or River
- NHD Waterbody
- Municipal Boundary
- Township Boundary
- City of Columbus Park Boundary or Easement

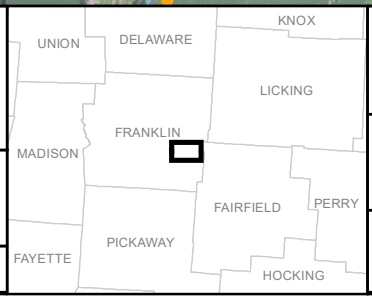
PADUS

- Private or Regional Agency Special District
- Local Government

Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NHD & PADUS (USGS 2021)
Transmission (AEP 2017)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

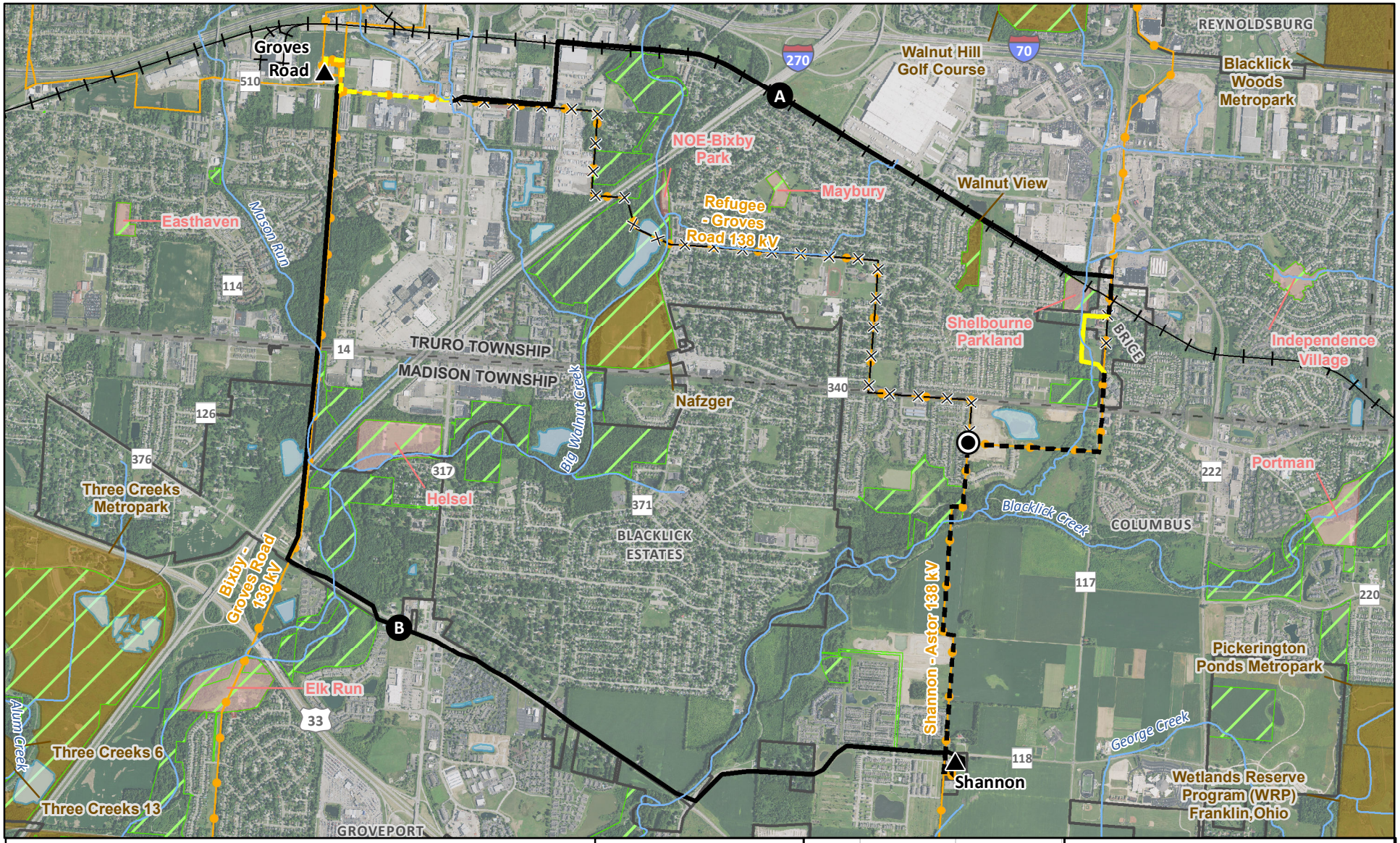


Map 3b
Revised Study Segment Network

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.55 1.1
Miles



Station
Refugee Switch (to be Removed)
NHD Stream or River
Railroad

Route Alternative

Double Circuit, Greenfield

Double Circuit, Rebuild
Single Circuit, Greenfield
Single Circuit, Rebuild
Existing Transmission to be Retired

Existing Transmission Line

69 kV and below
138 kV
345 kV
NHD Waterbody
Municipal Boundary

City of Columbus Park Boundary or Easement

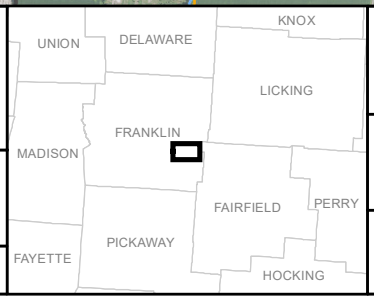
PADUS

Private or Regional Agency Special District
Local Government
Township Boundary

Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NHD & PADUS (USGS 2021)
Topo Quads (USGS 2013)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

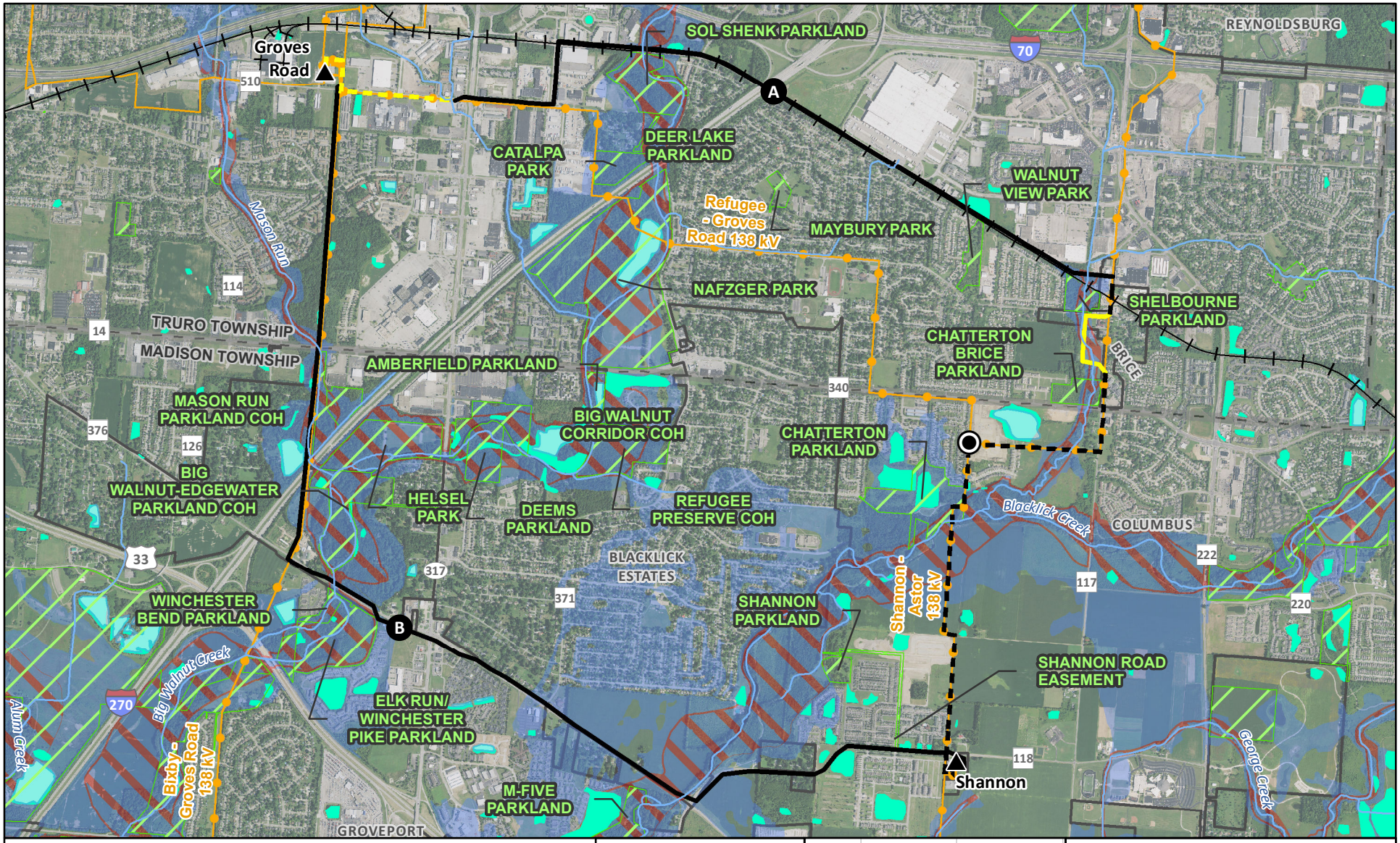


Map 4
Route Alternatives

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV Transmission Line Project

0 0.5 1
Miles



Station
Refugee Switch (to be Removed)
Railroad

Route Alternative
Double Circuit, Greenfield
Double Circuit, Rebuild

Single Circuit, Greenfield
Single Circuit, Rebuild

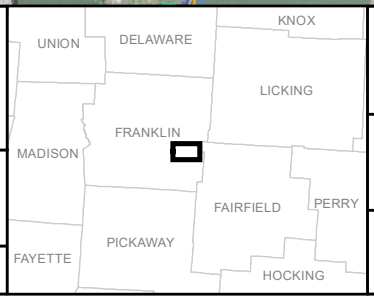
Existing Transmission Line
69 kV and below
138 kV
NHD Stream or River
NHD Waterbody
NWI Wetland

NFHL 100-year Floodplain
NFHL Regulatory Floodway
City of Columbus Park Boundary or Easement
Municipal Boundary
Township Boundary

Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NFHL (FEMA 2021)
NHD & PADUS (USGS 2021)
NWI (USFWS 2021)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

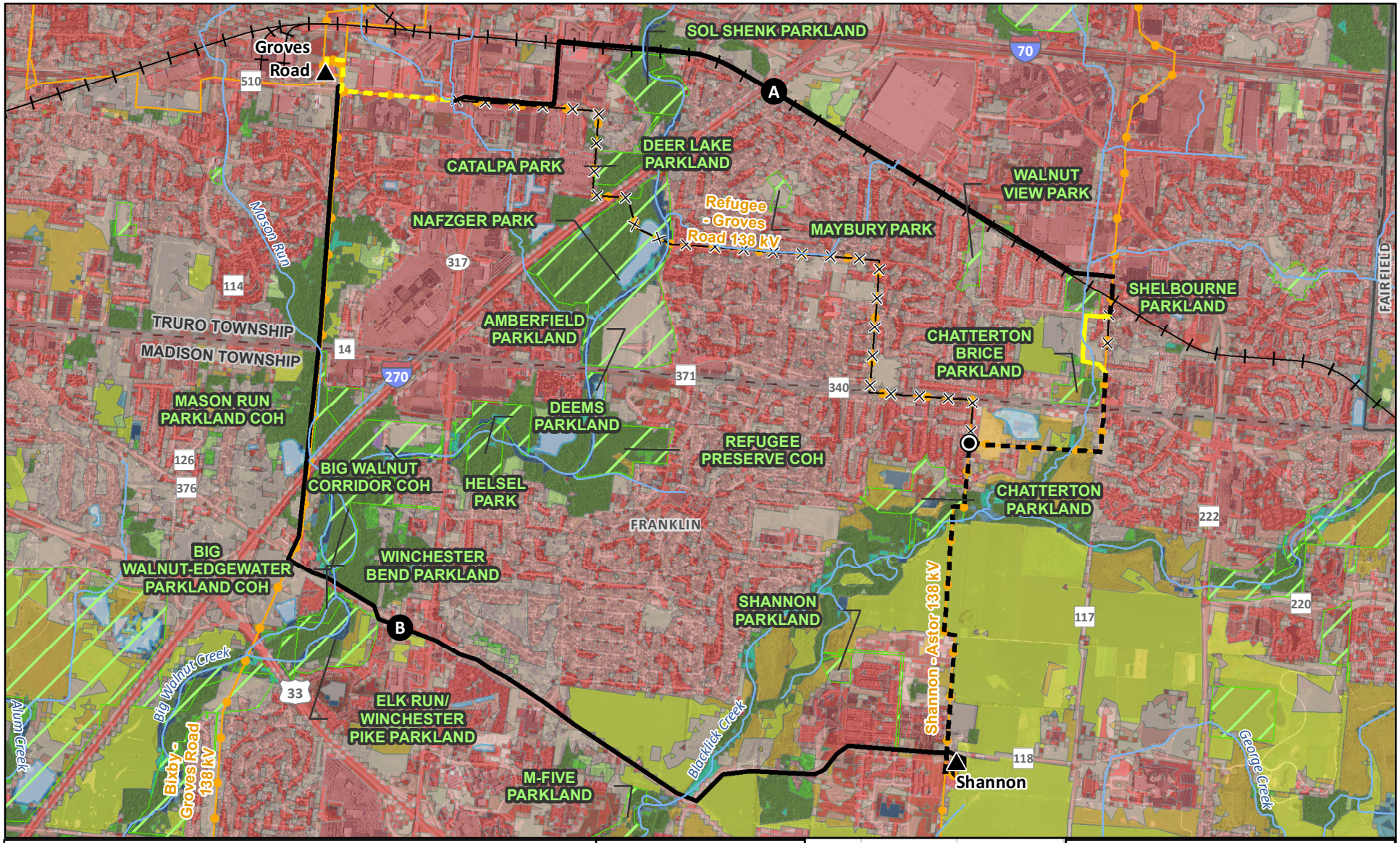


Map 5
Natural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.5 1
Miles



Station
Refugee Switch (to be Removed)
NHD Stream or River
Railroad

Route Alternative

Double Circuit, Greenfield
Double Circuit, Rebuild
Single Circuit, Greenfield
Single Circuit, Rebuild
Existing Transmission to be Retired
City of Columbus Park Boundary or Easement

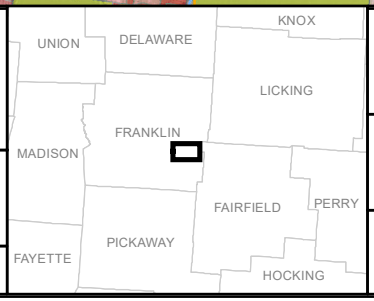
NCLD Description

Barren Land
Cultivated Crops
Deciduous Forest
Developed, High Intensity
Developed, Low Intensity
Developed, Medium Intensity
Developed, Open Space
Emergent Herbaceous Wetlands
Evergreen Forest
Grassland/ Herbaceous
Mixed Forest
Open Water
Pasture/Hay
Shrub/Scrub
Woody Wetlands
Municipal Boundary
Township Boundary

Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NCLD (USGS 2016)
NHD (USGS 2021)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

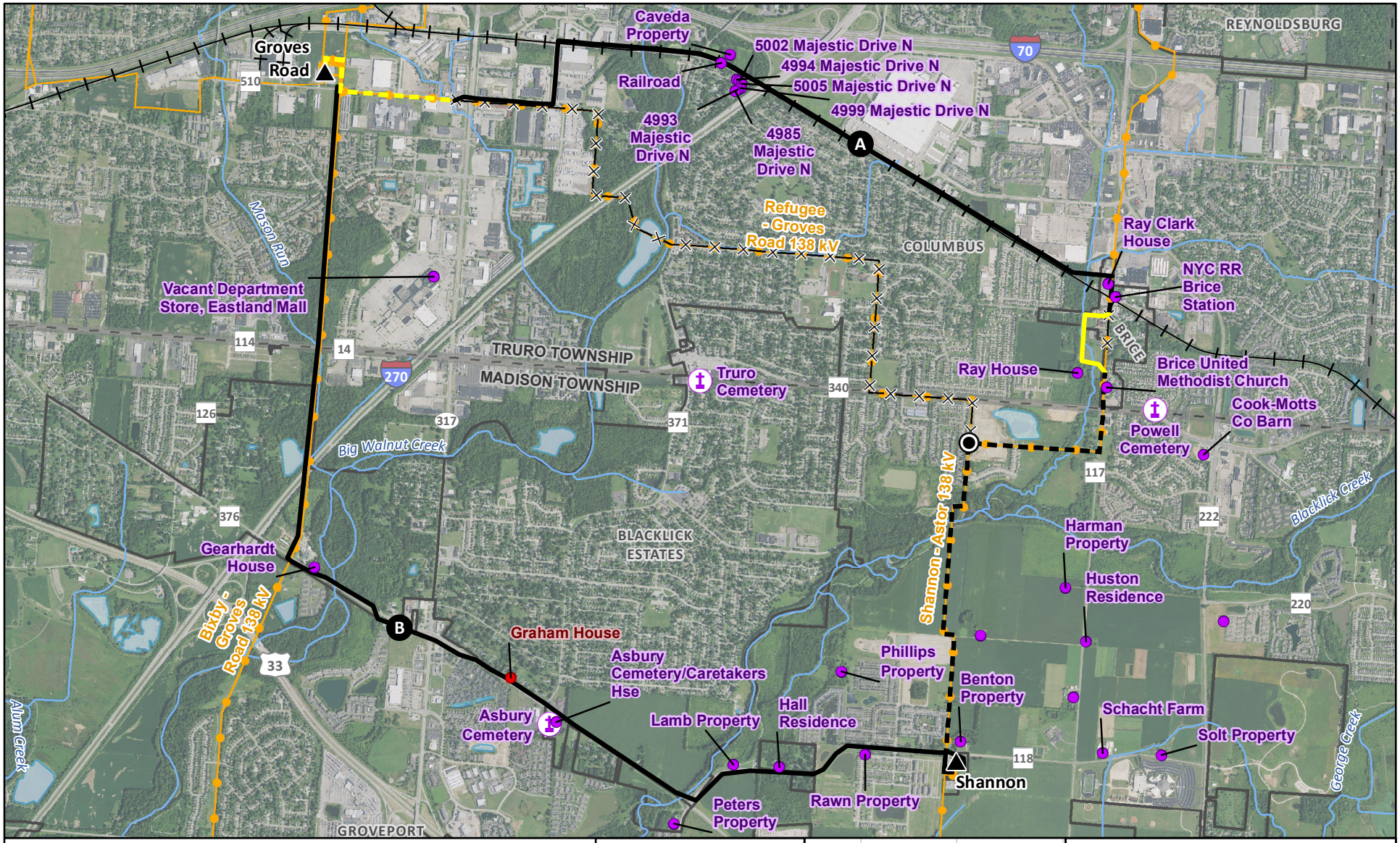


Map 6
Land Use

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV Transmission Line Project

0 0.5 1
Miles



Station
Refugee Switch (to be Removed)
NRHP Eligible Architectural Site
Known Architectural Site
Cemetery

Railroad

Route Alternative
Double Circuit, Greenfield
Double Circuit, Rebuild
Single Circuit, Greenfield

Single Circuit, Rebuild
Existing Transmission to be Retired

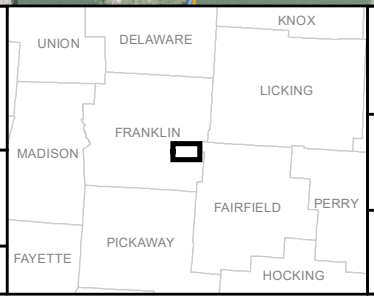
Existing Transmission Line
69 kV and below
138 kV

NHD Stream or River
NHD Waterbody
Municipal Boundary
Township Boundary

Data Sources:
Architectural Sites (OSHPO 2021)
Cemeteries (USGS 2021)
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NHD & PADUS (USGS 2021)
Transportation (ODOT 2021)

State Plane Ohio South
NAD 83

March 03, 2022

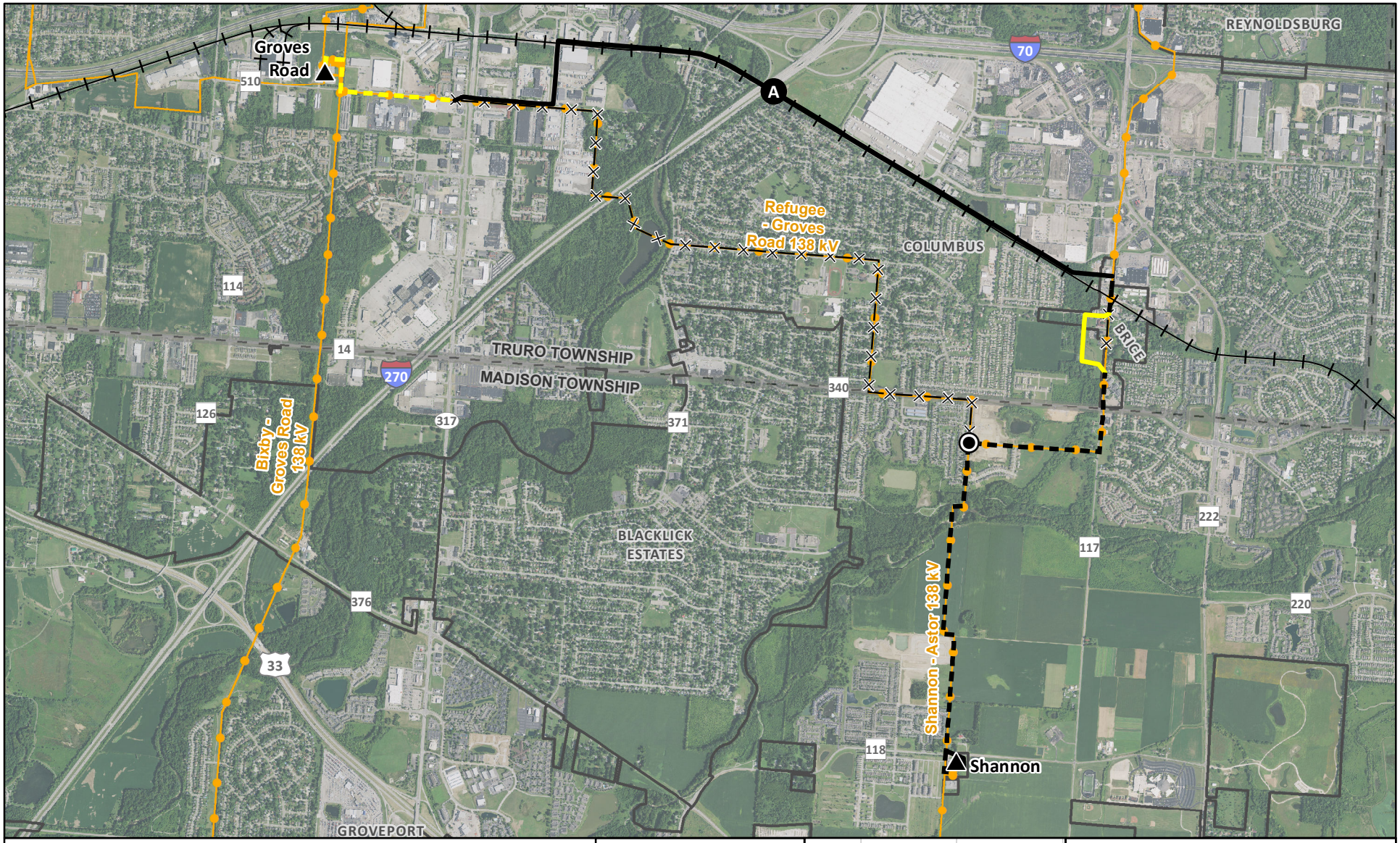


Map 7
Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 0.5 1
Miles


Groves Road
510
A
70
REYNOLDSBURG
Refugee - Groves Road 138 kV
COLUMBUS
BRICE
114
14
270
TRURO TOWNSHIP
MADISON TOWNSHIP
340
126
317
371
Bixby - Groves Road 138 kV
BLACKLICK ESTATES
222
117
220
376
33
Shannon - Astor 138 kV
118
Shannon
GROVEPORT
Station
Refugee Switch (to be Removed)
Railroad
Preferred Route
Double Circuit, Greenfield
Double Circuit, Rebuild
Single Circuit, Greenfield
Single Circuit, Rebuild
Existing Transmission to be Retired
Existing Transmission Line
69 kV and below
138 kV
345 kV
Municipal Boundary
Township Boundary
Data Sources:
Census Boundaries (ESRI 2021)
Imagery (OGRIP 2019)
NHD & PADUS (USGS 2021)
Transportation (ODOT 2021)
State Plane Ohio South
NAD 83
March 03, 2022
UNION
DELAWARE
KNOX
LICKING
FRANKLIN
MADISON
FAIRFIELD
PERRY
PICKAWAY
FAYETTE
HOCKING
Map 8
Preferred Route
AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY
Groves Road - Shannon 138 kV
Transmission Line Project
0
0.5
1
Miles

Attachment B: GIS Data Sources

Attachment B. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Land Use		
Number of parcels and landowners crossed by the ROW	Franklin County (2021)	Count of the number of parcels crossed by the ROW
Number of outbuildings or residential dwellings within 250 feet of the route centerline	Microsoft "US Building Footprints" downloaded 2019 and field verified from points of public access.	Count of the number of single-family and multi-family dwellings within the ROW, within 100 and 250 feet of potential routes
Number of commercial/industrial buildings within 250 feet of the route centerline	Microsoft "US Building Footprints" downloaded 2019 and field verified from points of public access.	Count of the number of commercial/industrial buildings within the ROW, within 100 and 250 feet of potential routes
Land use acreage and distance crossed by the ROW	National Land Cover Database (NLCD) (2016)	The NLCD 2016 (NLCD 2016) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed	National Conservation Easement Database (NCED) (2020)	Private conservation easements crossed by the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies
Number of archeological resources within the ROW and within 1 mile	Ohio State Historic Preservation Office (SHPO) (2021)	Previously identified archeological resources listed or eligible on the National Register of Historic Places (NRHP) acquired through the state historic preservation office.
Number of historic architectural resources within the ROW and within 1 mile	SHPO (2021)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP or included in the Indiana Historic Sites and Structures Inventory
Institutional uses (schools, places of worship and cemeteries) within 500 feet of the route centerline	U.S. Geological Survey (USGS) Geographic Names Information System (GNIS) (2021)	This dataset includes the locations of cemeteries, churches, hospitals, parks, and schools. Features within 1,000 feet of potential routes were field verified.
Airfield and heliports within 1 mile of the route centerline	GNIS (2021) and the Federal Aviation Administration (FAA) database (2020)	Distance from airfields and heliports
Natural Environment		
Forest clearing within the ROW	WSP	Acres of forest within the ROW observed by ecologists

Attachment B. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Field delineated streams and waterbodies crossed	WSP	Count the number of streams and waterbodies delineated by ecologists via Trimble Global Navigation Satellite System (GNSS)
Field delineated wetlands within the ROW	WSP	Acres of wetlands delineated by ecologists via Trimble GNSS
Acres of 100-year floodplain and regulatory floodway within the ROW	National Flood Hazard Layer (NFHL) (FEMA) (2019)	Acres of FEMA-designated 100-year floodplain (Zone A) and regulatory floodway (Zone AE) within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2019)	Miles of federal, state and local lands crossed by the ROW
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (2019)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Technical		
Route length	Measured in GIS	Length of route in miles
Number and severity of angled structures	Developed in GIS	Anticipated number of angled structures < 3 degrees, 3 to 45 degrees and over 45 degrees based on preliminary design
Number of road crossings	Ohio Department of Transportation (ODOT) Transportation Information Mapping System (TIMS) (2021)	Count of federal, state and local road crossings
Number of pipeline crossings	U.S. Department of Transportation National Pipeline Mapping System (2021)	Number of known pipelines crossed by the transmission ROW
Number of transmission line crossings	AEP Ohio Transco (2017)	Number of high voltage (100 kV or greater) transmission lines crossed by the ROW
Length of transmission line parallel	AEP Ohio Transco (2017)	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	U.S. Department of Transportation National Pipeline Mapping System (2019)	Miles of the route parallel to existing pipelines
Length of road parallel	ODOT TIMS (2021)	Miles of the route parallel to existing roads

Attachment C: Agency Correspondence

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

September 13, 2021

Bradley Rolfes
WSP USA
Suite 2500
312 Vine Street
Cincinnati, OH 45202

Re: 21-0780; Groves Road – Shannon 138 kV Transmission Line Rebuild Project Preferred Route

Project: The proposed project involves the extension of the existing transmission line exiting Groves Road Station east and south to existing transmission lines in the vicinity and ultimately to the Shannon Station.

Location: The proposed project is located in Madison Township, Franklin County, Ohio.

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

Natural Heritage Database: The Natural Heritage Database has the following data at or within a one mile radius of the project area:

Tippecanoe darter (*Etheostoma tippecanoe*), T
Pickerington Ponds Metro Park – Columbus & Franklin Co. Metro Parks
Blacklick Greenway Trail – Columbus & Franklin Co. Metro Parks

The review was performed on the project area specified in the 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. Additional comments on some of the features may be found in pertinent sections below.

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.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; U = state status under review; X = presumed extirpated in Ohio; FE = federal endangered, and FT = federal threatened.

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 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 Erin Hazelton at Erin.hazelton@dnr.ohio.gov).

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 is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the project area. Direction on how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that a potential hibernaculum is present within 0.25 miles of the project area, please send this information to Erin Hazelton 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 the 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 following listed mussel species.

Federally Endangered
purple cat's paw (*Epioblasma o. obliquata*)
clubshell (*Pleurobema clava*)
northern riffleshell (*Epioblasma torulosa rangiana*)
rayed bean (*Villosa fabalis*)
snuffbox (*Epioblasma triquetra*)

Federally Threatened
rabbitsfoot (*Quadrula cylindrica cylindrica*)

State Endangered
elephant-ear (*Elliptio crassidens crassidens*)
Long solid (*Fusconaia maculata maculate*)
Ohio pigtoe (*Pleurobema cordatum*)
pocketbook (*Lampsilis ovata*)
washboard (*Megalonaias nervosa*)

State Threatened
black sandshell (*Ligumia recta*)
fawnsfoot (*Truncilla donaciformis*)
pondhorn (*Uniomerus tetralasmus*)
threehorn wartyback (*Obliquaria reflexa*)

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:
https://ohiodnr.gov/static/documents/wildlife/permits/dow-protocol-ohio-mussel-survey.pdf

The project is within the range of the following listed fish species.

Federally Endangered
Scioto madtom (*Noturus trautmani*)

State Endangered
goldeye (*Hiodon alosoides*)
Iowa darter (*Etheostoma exile*)
popeye shiner (*Notropis ariommus*)
northern brook lamprey (*Ichthyomyzon fossor*)
spotted darter (*Etheostoma maculatum*)
shortnose gar (*Lepisosteus platostomus*)
tonguetied minnow (*Exoglossum laurae*)

State Threatened
lake chubsucker (*Erimyzon sucetta*)
paddlefish (*Polyodon spathula*)
Tippecanoe darter (*Etheostoma tippecanoe*)

The DOW recommends no in-water work in perennial streams from March 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 American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their

foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the cattle egret (*Bubulcus ibis*), a state endangered bird. Cattle egrets are not strictly wetland birds. They often forage in dry pastures and fields. Egrets nest in colonies and will build a nest out of sticks and other materials wherever it can be supported. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 through August 15. If no wetland habitat will be impacted, the project is not likely to impact this 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 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

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

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through august 31. If this habitat will not be impacted, this project is not likely to have an impact on 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 through 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 US Fish & Wildlife Service.

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 Mike Pettegrew at mike.pettegrew@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

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

September 13, 2021

Bradley Rolfes
WSP USA
Suite 2500
312 Vine Street
Cincinnati, OH 45202

Re: 21-0781; Groves Road – Shannon 138 kV Transmission Line Rebuild Project Alternate Route

Project: The proposed project involves the extension of the line from the Groves Road Station south and east to Shannon Station.

Location: The proposed project is located in Madison Township, Franklin County, Ohio.

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

Natural Heritage Database: The Natural Heritage Database has the following data at or within a one mile radius of the project area:

Elktoe (*Alasmidonta marginata*), SC
Wavy-rayed lampmussel (*Lampsilis fasciola*), SC
Tippecanoe darter (*Etheostoma tippecanoe*), T
Three Creeks Metro Park – Columbus & Franklin Co. Metro Parks
Blacklick Creek Greenway Trail – Columbus & Franklin Co. Metro Parks
Big Walnut Greenway – Columbus & Franklin Co. Metro Parks

The review was performed on the project area specified in the 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. Additional comments on some of the features may be found in pertinent sections below.

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.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; U = state status under review; X = presumed extirpated in Ohio; FE = federal endangered, and FT = federal threatened.

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 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 Erin Hazelton at Erin.hazelton@dnr.ohio.gov).

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 ≥ 20 if possible.

The DOW also recommends that a desktop habitat assessment is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the project area. Direction on how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that a potential hibernaculum is present within 0.25 miles of the project area, please send this information to Erin Hazelton 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 the 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 following listed mussel species.

Federally Endangered	Federally Threatened
purple cat's paw (*Epioblasma o. obliquata*)	rabbitsfoot (*Quadrula cylindrica cylindrica*)
clubshell (*Pleurobema clava*)	
northern riffleshell (*Epioblasma torulosa rangiana*)	
rayed bean (*Villosa fabalis*)	
snuffbox (*Epioblasma triquetra*)	

State Endangered
elephant-ear (*Elliptio crassidens crassidens*)
Long solid (*Fusconaia maculata maculate*)
Ohio pigtoe (*Pleurobema cordatum*)
pocketbook (*Lampsilis ovata*)
washboard (*Megalonaias nervosa*)

State Threatened
black sandshell (*Ligumia recta*)
fawnsfoot (*Truncilla donaciformis*)
pondhorn (*Uniomerus tetralasmus*)
threehorn wartyback (*Obliquaria reflexa*)

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:
https://ohiodnr.gov/static/documents/wildlife/permits/dow-protocol-ohio-mussel-survey.pdf

The project is within the range of the following listed fish species.
Federally Endangered
Scioto madtom (*Noturus trautmani*)

State Endangered
goldeye (*Hiodon alosoides*)
Iowa darter (*Etheostoma exile*)
popeye shiner (*Notropis ariommus*)
northern brook lamprey (*Ichthyomyzon fossor*)
spotted darter (*Etheostoma maculatum*)
shortnose gar (*Lepisosteus platostomus*)
tonguetied minnow (*Exoglossum laurae*)

State Threatened
lake chubsucker (*Erimyzon sucetta*)
paddlefish (*Polyodon spathula*)
Tippecanoe darter (*Etheostoma tippecanoe*)

The DOW recommends no in-water work in perennial streams from March 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 American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during

the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the cattle egret (*Bubulcus ibis*), a state endangered bird. Cattle egrets are not strictly wetland birds. They often forage in dry pastures and fields. Egrets nest in colonies and will build a nest out of sticks and other materials wherever it can be supported. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 through August 15. If no wetland habitat will be impacted, the project is not likely to impact this 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 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

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

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through august 31. If this habitat will not be impacted, this project is not likely to have an impact on 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 through 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 US Fish & Wildlife Service.

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 Mike Pettegrew at mike.pettegrew@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

Rolfes, Brad

From: Ohio, FW3 <ohio@fws.gov>
Sent: Friday, August 27, 2021 10:07 AM
To: Rolfes, Brad
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate; Thomayer, Matthew; Grant S Stuller
Subject: AEP - Groves Road – Shannon Transmission Line Rebuild Alternate Route, Franklin County, Ohio

TAILS# 03E15000-2021-TA-2140

Dear Mr. Rolfes,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

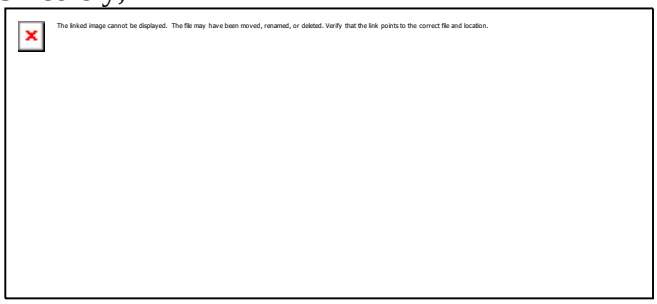
Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

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

Sincerely,



Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

Rolfes, Brad

From: Ohio, FW3 <ohio@fws.gov>
Sent: Friday, August 27, 2021 10:11 AM
To: Rolfes, Brad
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate; Thomayer, Matthew; Grant S Stuller
Subject: AEP - Groves Road – Shannon Transmission Line Preferred Route, Franklin County, Ohio

TAILS# 03E15000-2021-TA-2141

Dear Mr. Rolfes,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

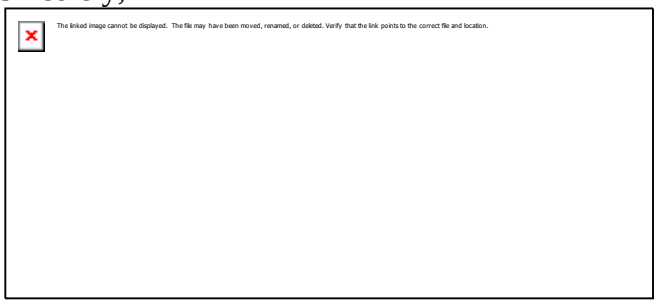
Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

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

Sincerely,



Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-05 PROJECT DESCRIPTION 5-1

(A) DESCRIPTION OF THE PROJECT AREA 5-1

(1) Geography and Topography 5-1

(2) Proposed Right-of-Way, Transmission Length, and Properties Crossed 5-4

(B) LAYOUT AND CONSTRUCTION 5-5

(1) Proposed clearing, construction methods, and reclamation operations 5-5

(2) Facility Layout 5-7

(C) TRANSMISSION EQUIPMENT 5-8

(1) Electric Transmission Line Data 5-8

(2) Electric Transmission Station Data 5-9

(3) Gas Transmission Line Data 5-9

4906-5-05 PROJECT DESCRIPTION

(A) PROJECT AREA DESCRIPTION

This section provides a description of the Project area's geography, topography, populated centers, major industries, and landmarks.

(1) Project Area Map

Figure 5-1A through **Figure 5-1J** provides maps at 1:12,000 scale, showing an overview of the Preferred and Alternate Routes for the Project. These maps include the area 1,000 feet on each side of the proposed transmission centerlines. These maps depict the proposed transmission line, roads, parks, and recreational areas that are publicly owned, existing electric transmission line corridors, named lakes, reservoirs, streams, canals, rivers, and land use.

The information on the maps were updated through review of digital and georeferenced aerial photography, property parcel data from the Franklin County Auditor, and field reconnaissance completed in August 2020. The aerial photographs are georeferenced, orthocorrected color images derived from ESRI ArcGIS Online.

(a) Proposed Transmission Line Alignments: The proposed alignments for the Preferred and Alternate Routes for the Project, including the proposed turning points, are shown in **Figure 5-1A** through **Figure 5-1J**. Detailed descriptions of the routes are provided in Section 4906-5-02(A) (3).

(b) Proposed Station Locations: This section is not applicable for this Project.

(c) Major Highways and Railroad Routes: Major highways within 1,000 feet of the Preferred and Alternate Routes include Interstate Highway 70 (I-70), which crosses the Project area in an east-west direction, is located north of the Preferred Route and is not crossed by either route. Interstate Highway 270 (I-270) travels northeast to southwest across the Project and is crossed by both routes once. South Hamilton Road/State Highway 317 (OH-317) crosses the western portion of the Project area and is crossed by both routes once. Several county, township, and other local roads are also located within 1,000 feet of the routes.

One active railroad is located within 1,000 feet of the Preferred and Alternate Routes. The Norfolk Southern West Virginia Branch Railroad is active and crosses the Project area from west to southeast. Several shorter branch lines are also present within the main railroad corridor and adjacent south of the West Virginia Branch, beginning approximately 1,600 feet east of Cloverleaf Street (MR 451) and continuing west until splitting off to the south and terminating at industrial properties west of the Groves Road Station. The Preferred Route parallels the railroad corridor to the north between Cloverleaf Street (MR 451) and Brice Road (CR 117). Overall, the Preferred Route requires two railroad corridor crossings, and the Alternate Route does not require any railroad corridor crossings. Major roads and railroads are shown on **Figure 5-1A** through **Figure 5-1J**.

(d) Publicly identified and owned institutions, parks and recreational areas: Two government offices are located within 1,000 feet of the Preferred Route. The Brice Government Office is approximately 270 feet northeast of Old Refugee Road (CR 14) and Brice Road (CR 117), addressed 5990 Columbus Street, and the Brice Post Office is located approximately 575 feet southwest of Old Refugee Road (CR 14) and Brice Road (CR 117), addressed 3045 Brice Road. No other public buildings were identified in the Project area.

Five public, City of Columbus, parks are located within 1,000 feet of the Preferred Route, including: (1) Sol Shenk Parkland, located approximately 0.3 mile northeast of Cloverleaf Street (MR 451) and Groves Road (MR 957); (2) Walnut View Park, located approximately 0.5 mile northwest of Old Refugee Road (CR 14) and Brice Road (CR 117); (3) Shelbourne Parkland, located approximately 360 feet northwest of Old Refugee Road (CR 14) and Brice Road (CR 117); (4) Chatterton Brice Parkland, located adjacent northwest of the intersection of Chatterton Road (CR 340) and Brice Road (CR 117), and (5) Chatterton Parkland, located approximately 0.6 mile southwest of Chatterton Road (CR 340) and Brice Road (CR 117). Two of these five public parks are also identified on the United States Geological Survey (USGS) Protected Areas Database of the US (PADUS): Walnut View Park is identified as a private recreation or education scenic area and Shelbourne Parkland is identified as a local government park.

Six public City of Columbus parks are located within 1,000 feet of the Alternate Route: Mason Parkland COH, Helsel Park, and Big Walnut Parkland are located approximately 0.4 mile northeast

of I-270 and Winchester Pike (CR 376); Winchester Bend Parkland and Elk Run Park are located approximately 0.4 mile southeast of I-270 and Winchester Pike (CR 376), and M-Five Parkland is located approximately 0.2 mile west of Winchester Pike (376) and Shannon Road/Ebright Road (CR 118). Of these six public parks, Helsel Park is also identified on PADUS; however, the PADUS boundaries are not located within 1,000 feet of the Alternate Route.

(e) Utility Corridors: There are seven existing transmission line corridors within 1,000 feet of the Preferred and Alternate Routes. The Bixby – Groves Road 138 kV Transmission Line traverses south to north along the western portion of the Project area and connects into the Groves Road Station. The Bixby – Shannon 138 kV Transmission Line intersects the southeastern-most portion of the Project area, connecting to the Shannon Station from the south. The Groves Road – Bexley 138 kV, Groves Road – Etna 40 kV, and Groves Road – Livingston Avenue 40 kV transmission lines intersect the northwestern-most portion of the Project area, connecting to Groves Road Station either from the north or east. The Refugee – Groves Road 138 kV Transmission Line crosses the central Project area southeast to northwest, connecting to the Groves Road Station. The Shannon – Astor 138 kV Transmission Line traverses southwest to northeast along the eastern portion of the Project area and connects into the Shannon Station.

The Preferred Route includes a proposed rebuild of approximately 2.4 miles of the existing Shannon – Astor 138 kV Transmission Line and approximately 0.6 mile of the existing Refugee – Groves 138 kV Transmission Line within existing and maintained ROW. The Alternate Route includes a proposed rebuild of approximately 0.2 mile of the existing Refugee – Groves Road 138 kV Transmission Line and approximately 0.1 mile of the existing Shannon – Astor 138 kV Transmission Line within existing and maintained ROW. The Alternate Route also proposes paralleling the westside of the existing Bixby – Groves Road 138 kV Transmission Line for approximately 1.9 miles within existing, unmaintained ROW.

According to the National Pipeline Mapping System (“NPMS”), there are no known natural gas pipelines or hazardous liquid pipelines within the Study Area.

The alignments of existing transmission lines are identified on **Figure 5-1A** through **Figure 5-1J**.

(f) Lakes, Ponds, Reservoirs, Streams, Canals, and Rivers: There are no named lakes, reservoirs, or canals within the Project area. There are three named major streams within 1,000 feet of the Preferred and Alternative Routes: Big Walnut Creek flows north to southwest through the central portion of the Project area, Blacklick Creek flows northeast to southwest through the eastern portion of the Project area, and Mason Run flows northwest to south through the western portion of the Project area. The Preferred Route and Alternate Route both require one crossing of Big Walnut Creek and Blacklick Creek. The Alternate Route requires one crossing of Mason Run.

A full description of the lakes, ponds, reservoirs, streams, canals, rivers, and swamps (i.e. wetlands) located within 1,000 feet of the Preferred and Alternate Routes is provided in Section 4906-05-08(B)(1) of this Application. Maps at 1:6,000 scale showing water bodies mapped by the USGS and in the Project area, in addition to streams, ponds, and wetlands delineated within 260 feet of the Preferred and Alternate Routes are included displayed in **Figure 8-2A** through **8-2J**.

(g) Population Centers and Legal Boundaries: Population centers and legal boundaries within the vicinity of the proposed transmission line locations are shown on **Figure 5-1A** through **Figure 5-1J**. Legal boundaries within 1,000 feet of the Preferred and Alternate Routes include Truro and Madison Townships; the City of Columbus, the Village of Brice Village, and the Census Designated Place (CDP) of Blacklick Estates in Franklin County, Ohio.

(2) Proposed Right-of-Way, Transmission Length, and Properties Crossed

The Preferred Route is 6.6 miles long and crosses 123 parcels. Of these 123 parcels, 74 are currently within the ROW of the existing Shannon – Astor 138 kV Transmission Line, and 5 are currently within the ROW of the existing Groves Road – Refugee 138 kV Transmission Line, which are proposed to be rebuilt as part of the Preferred Route. The Alternate Route is 5.2 miles long and crosses 54 parcels. Of these 54 parcels, four are currently within the ROW of the existing Shannon – Astor 138 kV Transmission Line, where rebuild is proposed, and 11 are within the existing Bixby – Groves Road 138 kV Transmission Line ROW. Both Route Alternatives have a proposed ROW width of 60 feet and use some amount of existing 138 kV transmission ROW. The Preferred Route requires 27.3 acres of greenfield ROW and uses 21 acres of existing, maintained

ROW, for a total ROW of 48.3 acres. The Alternate Route requires 21.3 acres of greenfield ROW and uses 16.2 acres of existing, unmaintained ROW, for a total ROW of 37.5 acres.

(B) ROUTE OR SITE ALTERNATIVE FACILITY LAYOUT AND INSTALLATION

(1) Proposed clearing, construction methods, and reclamation operations

The following paragraphs describe the proposed site clearing, construction methods, and reclamation operations of the Project.

(a) Surveying and Soil Testing

The Preferred Route has been surveyed to establish the centerline, ROW, and pole locations. The survey was completed using conventional and/or aerial methods. Topographic features and man-made structures in the vicinity of the Preferred Route that may affect the design were located during the survey. Offsets were used to survey around large trees and other large obstructions. Profile measurements were obtained by conventional or aerial methods. If the Alternate Route is selected surveying will be required using the same process outlined above. The centerline and ROW will be staked prior to construction.

Soil and rock tests may be performed along portions of the final approved route, if foundations for poles are necessary. Augered test borings will be achieved using a machine-driven auger at least 4 inches in diameter. Soil samples will be obtained continuously to an approximately 11-foot depth and then 5-foot intervals below 11 feet, and at any change in subsurface strata. Sampling will include split barrel samples in non-cohesive soils and thin-walled tube samples in cohesive soils. Typically, the testing will perform to a depth of 30 to 40 feet. If rock is encountered, a carbide-tipped bit will be drilled 5 to 10 feet into the rock.

(b) Grading and Excavation

Soil surface grading for the Project is not anticipated. It is anticipated that several self-supporting steel pole locations will be installed by direct-embed methods. Due to site-specific requirements, some self-supporting steel poles may require concrete foundations. The excavation for each

foundation will be approximately 5.5 to 8 feet in diameter and 20 to 35 feet deep. The Company will backfill around the foundation as necessary with clean fill, which consists of stone and stand. The remaining excavated material will be hauled off-site to an approved soils disposal site.

(c) Construction of Access Roads and Trenches

Construction access will be required for installation of the pole structures and stringing of the conductor cable or wire. Access roads will require the landowner's input and approval. Preliminary access roads are presented on **Figure 8-2A** through **Figure 8-2J**. Note that these access roads cannot be fully planned and identified until after a final route is approved and contact with affected landowners for the transmission line easements has been completed by the Company. Where access across wetlands or streams is necessary, timber mats or equivalent will be used where possible to minimize the environmental impacts. If field conditions necessitate the modification of the finalized access road locations during construction, the concurrence of the property owner will be obtained, necessary environmental field studies will be performed, and necessary permits will be updated.

(d) Stringing of Cable

During wire stringing operations, areas along the transmission line will be used as setup locations for the wire pulling equipment (such as conductor reels, groundwire reels, and the wire tensioner). Conductor will be installed using the tension stringing method. Lightweight cables or ropes will be fed through the stringing sheaves mounted on the poles. Conductors will be pulled through under sufficient tension to keep the conductor off the ground to prevent any damage to the conductor. Temporary guard or clearance poles will be used as a safety precaution at locations where the conductors could create a hazard to either crewmembers or the public. The locations and heights of clearance poles will be such that conductors are held clear of other electric distribution lines, communication cables, railroads and roadways. The stringing operation will be under the observation of transmission line construction crewmembers at all times. The observers will be in radio or visual contact with the operator of the stringing equipment.

(e) Installation of Electric Transmission Line Poles and Structures, including Foundations

The Project will be constructed using steel poles of varying types. Most pole locations will involve direct embed installation. Where necessary, due to site-specific conditions, installation of a concrete foundation may be used. The excavation of each concrete foundation will be approximately 5.5 to 8 feet in diameter and 20 to 35 feet deep.

(f) Post Construction Reclamation

Topsoil at pole excavations will be stockpiled when necessary and protected from erosion. Topsoil will be redistributed over disturbed areas to foster re-vegetation following construction (except in wetland areas). Restoration, including temporary and permanent seeding, will be coordinated with the construction activities to provide re-vegetation and soil stabilization at the earliest reasonable time. Following construction, all pole locations, material storage sites, and temporary access roads will be seeded with a suitable grass seed mixture as specified in the erosion and sediment control plan.

Re-vegetation techniques will enhance the ROW for use as possible wildlife habitat. Where stream banks are disturbed, they will be restored by planting of low-growing species, where necessary in order to reduce bank erosion. Lawn or garden areas, or paved areas damaged during the construction of the transmission line, will be restored to pre-construction conditions. Landscaping or landscape plantings damaged during construction will also be restored to pre-construction conditions or replaced as directed by affected property owners. After restoration is complete, the Company will periodically inspect the ROW for areas of erosion, sedimentation and inadequate re-vegetation conditions, if any. If such conditions are identified, corrective actions will be implemented.

(2) Facility Layout

No new associated facilities such as new stations or switch stations are proposed for the Project.

(a) Transmission Line Route Map

Figure 8-2A through **Figure 8-2J** show maps at 1:12,000 scale of the Preferred and Alternate Routes. These maps illustrate the data required by OAC 4906-5-05(A)(1). Although the additional information required by OAC 4906-5-05(B)(2)(a) (e.g., pole structure locations) will not be

finalized until a final route is approved by the OPSB and the final engineering design is complete, preliminary locations are provided for the Preferred and Alternate Routes. The data and information defined in OAC 4906-5-05(B)(2)(a) includes temporary access roads and proposed locations for transmission line poles. No buildings or fenced-in or secured areas are planned for the transmission line Project.

The Company is currently identifying staging areas and laydown areas for the Project. To date, none have been identified within the Project area. After sites are identified, the Company will provide final locations that support this Project.

(b) Reasons for Proposed Layout and Unusual Feature

A detailed description of the reasons for the proposed layout (i.e., the Preferred Route and Route Alternative) are presented in the RSS in **Appendix 4-1**. There are no unusual features within the Project area beyond the generally developed land use.

(c) Future Modification Plans: The Company's planning engineers generally forecast future transmission projects in a five-year planning window. The Company currently has no plans for future modifications of the proposed Groves Road-Shannon 138 kV Transmission Line.

(C) TRANSMISSION EQUIPMENT

(1) Electric Transmission Line Data

(a) Design Voltage: The Groves Road-Shannon 138 kV Transmission Line will be designed for and operated at 138 kV.

(b) Pole, Conductor, and Insulator Design: The majority of the line will be composed of a tangent, Alternating Delta monopole structures (Figure 5-1) with an estimated aboveground height of 86 feet (116 feet total length). The conductor used for the new transmission line will be a 795 thousand circular mil ("kcm") 26/7 aluminum conductor steel-reinforced cable ("ACSR") per phase. This conductor has a maximum strength of approximately 31,500 pounds ("lbs."). The new line will utilize one 7#10 Alumoweld shield wire. The 7#10 shield wire has a maximum strength of 10,020 lbs. Both the phase conductors and the shield wire will be installed in accordance to the

latest version of the National Electric Safety Code. The conductors will be supported by aluminum clamps which will be attached to the insulators. Aluminum suspension clamps will support the shield wires. At dead-end locations, compression dead-end clamps will be used on both the conductor and the shield wire.

(c) Base and Foundation Design: All medium to heavy angle locations may require installation of one concrete foundation. The excavation for each concrete foundation will be approximately 5.5 to 8 feet in diameter and 20 to 35 feet deep.

(d) Underground Cable: There are no underground cables associated with this Project; therefore, this section is not applicable.

(e) Other Major Equipment or Special Structures: There is no other major equipment or special structures associated with this Project; therefore, this section is not applicable.

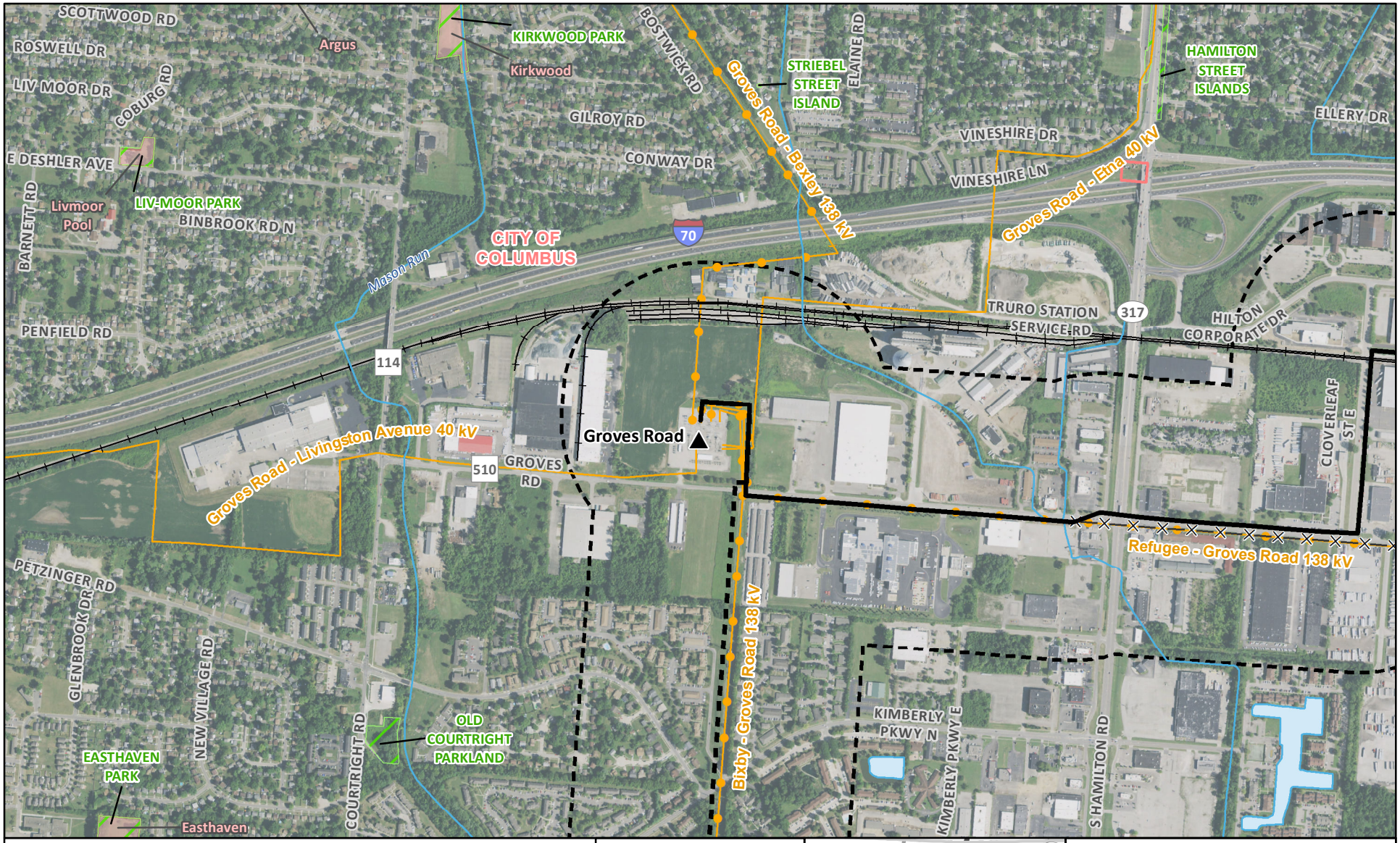
(2) Electric Transmission Station Data

Not applicable.

(3) Gas Transmission Line Data

Not applicable.

FIGURES



- Existing Station
- Railroad
- Preferred Route
- Alternate Route
- Existing Transmission to be Retired

Existing Transmission Line

- 69 kV and below
- 138 kV
- Railroad
- NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

- Local Government
- Township Boundary
- Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South NAD 83

March 03, 2022

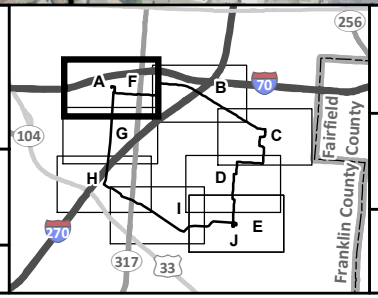
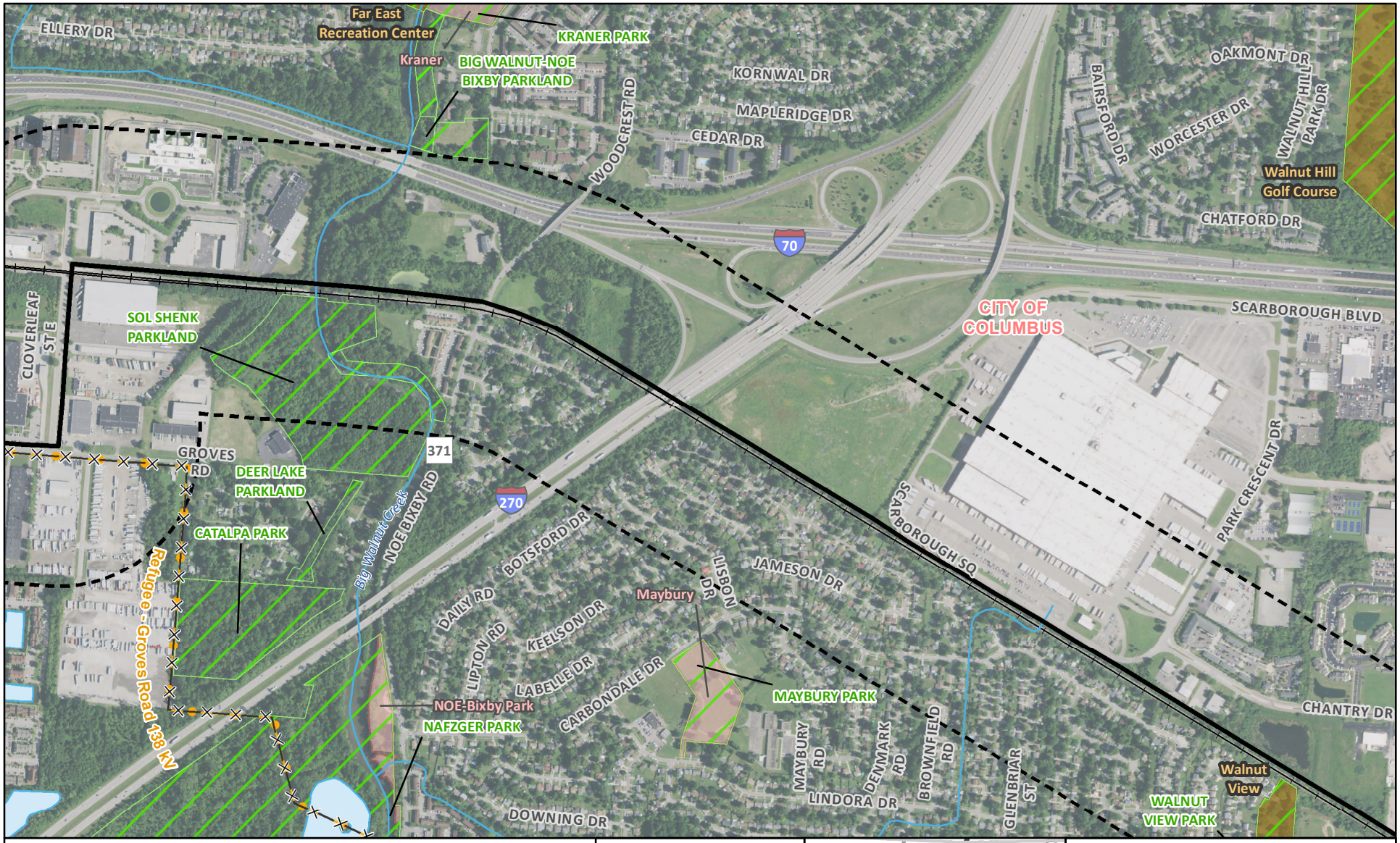


Figure 5-1A
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Railroad
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV
Railroad
NHD Stream or River
1,000 Foot Buffer

NHD Waterbody
City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type
Local Government
Private Land

Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

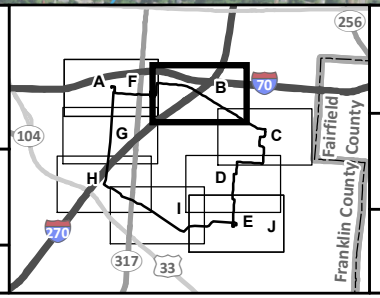
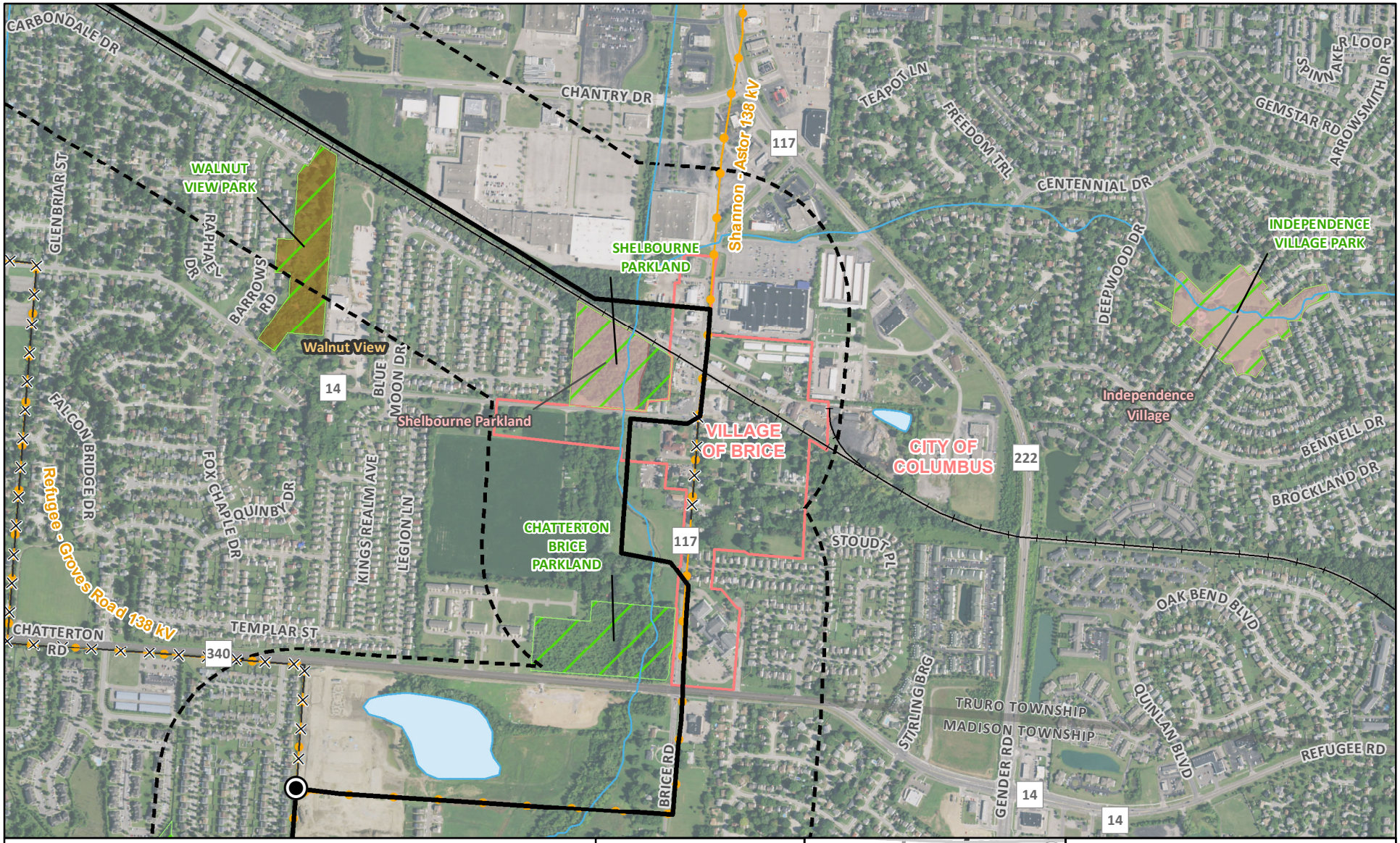


Figure 5-1B
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Refugee Switch (to be removed)
Railroad
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV

Railroad
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type
Local Government

Private Land
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

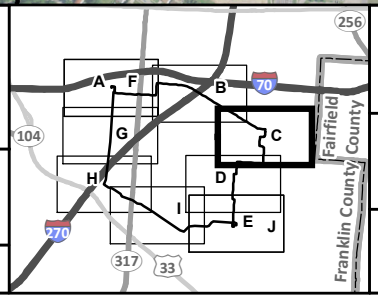
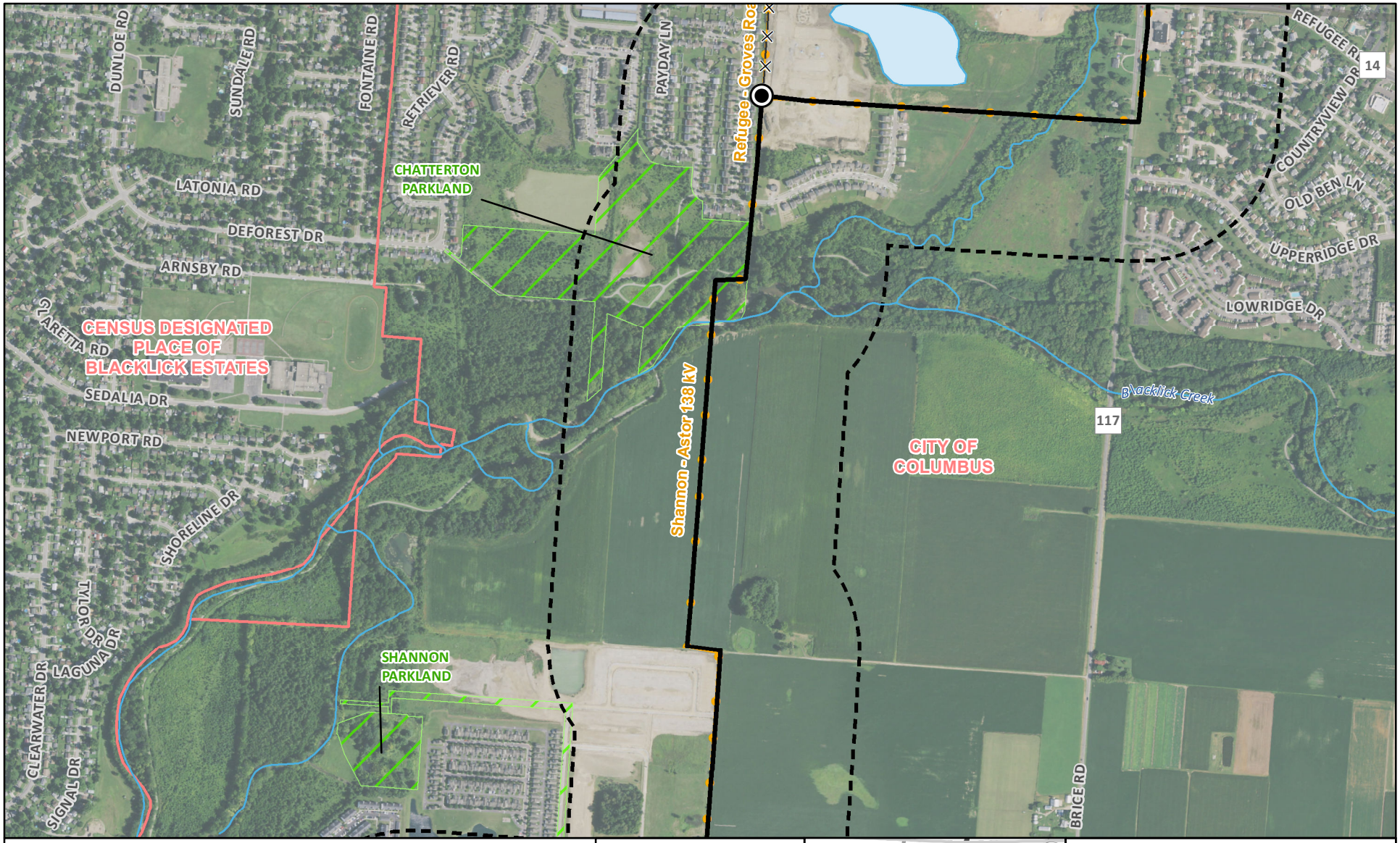


Figure 5-1C
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Refugee Switch (to be removed)
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer

NHD Waterbody
City of Columbus Park or Easement Boundary
Township Boundary

Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

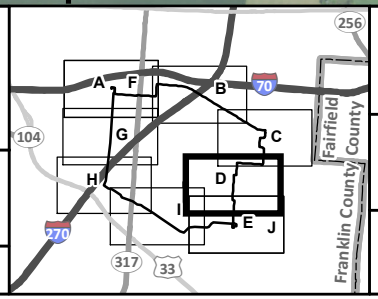
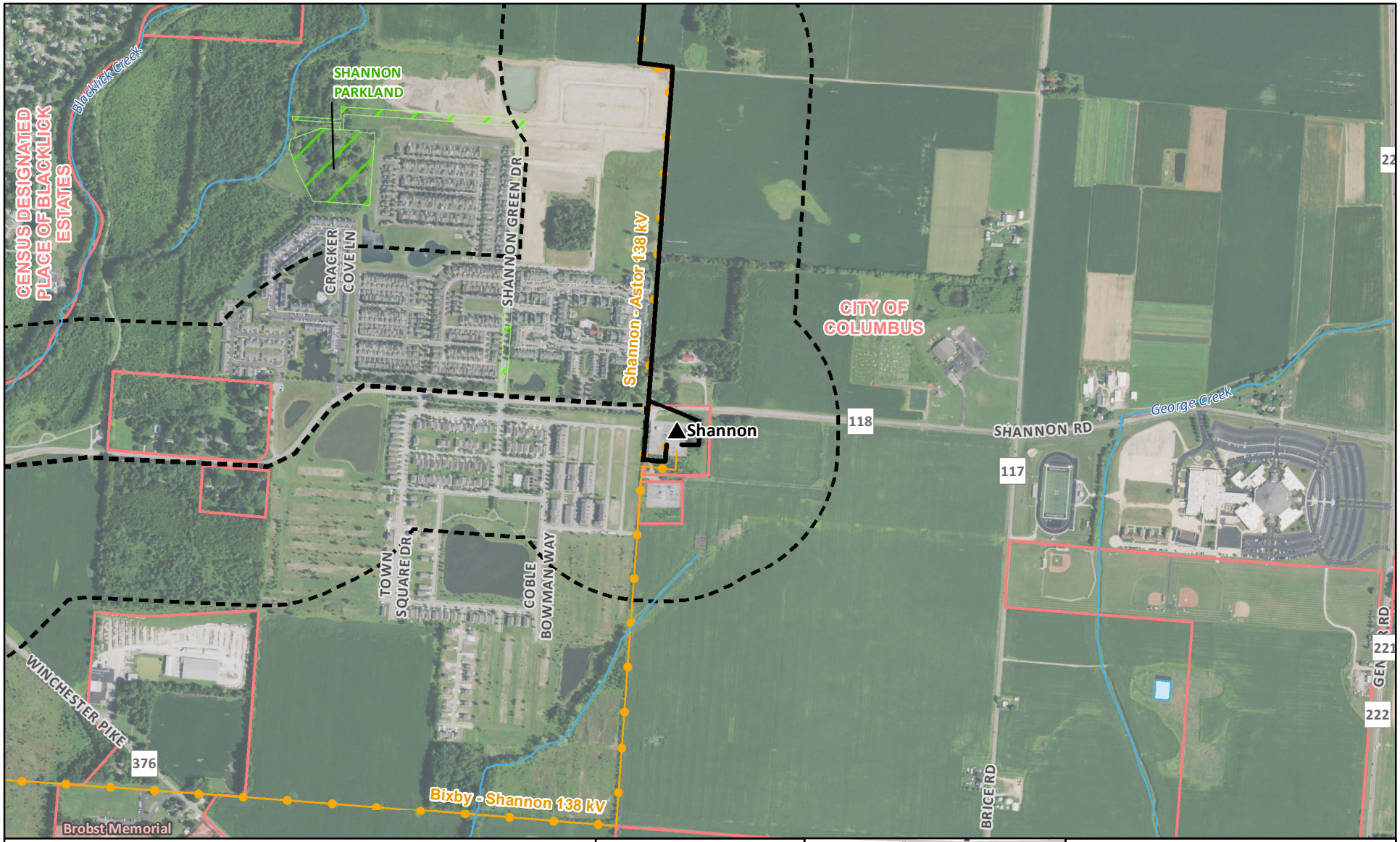


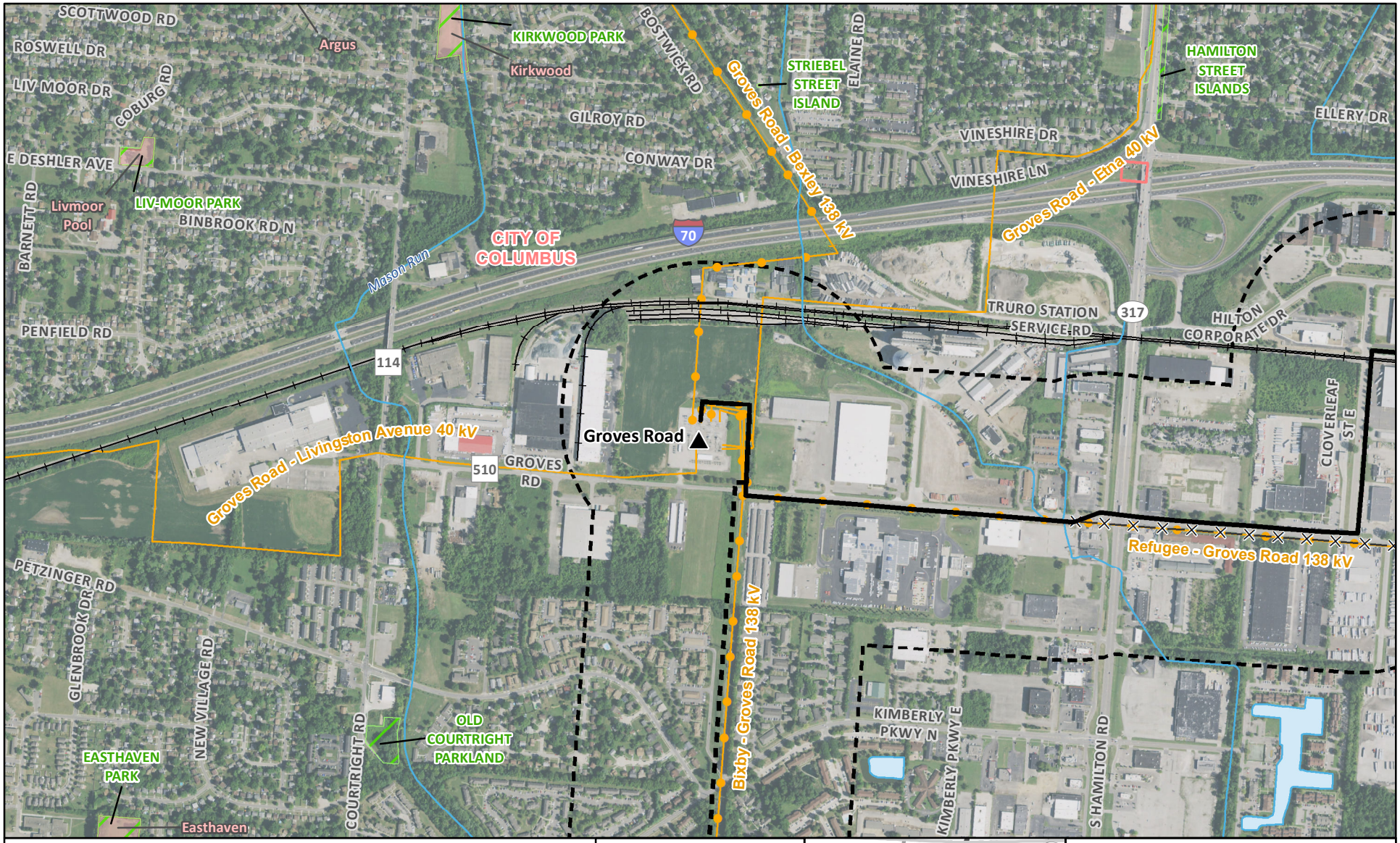
Figure 5-1D
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
Blacklick Creek
SHANNON PARKLAND
CRACKER COVE LN
SHANNON GREEN DR
Shannon - Astor 138 kV
CITY OF COLUMBUS
Shannon
118
SHANNON RD
George Creek
117
TOWN SQUARE DR
COBLE BOWMAN WAY
WINCHESTER PIKE
376
Bixby - Shannon 138 kV
Brobst Memorial
BRICE RD
222
Existing Station
Preferred Route
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
City of Columbus Park or Easement Boundary
Protected Areas - Ownership Type
Local Government
Township Boundary
Municipal Boundary
Data Sources: AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South NAD 83
March 03, 2022
Franklin County
Fairfield County
Figure 5-1E
Alternative Routes Overview
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV Transmission Line Project
0
1,000
2,000
Feet



- Existing Station
- Railroad
- Preferred Route
- Alternate Route
- Existing Transmission to be Retired

Existing Transmission Line

- 69 kV and below
- 138 kV
- Railroad
- NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

- Local Government
- Township Boundary
- Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South NAD 83

March 03, 2022

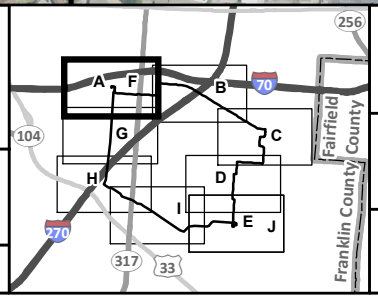


Figure 5-1F
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



- Alternate Route
- **Existing Transmission Line**
  - 138 kV
  - NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- City of Columbus Park or Easement Boundary
- **Protected Areas - Ownership Type**
  - Local Government
  - Township Boundary
  - Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

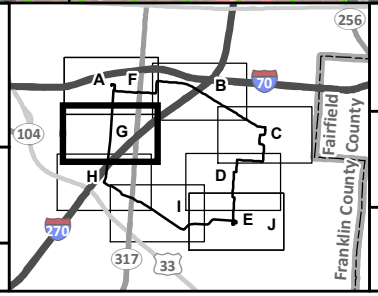
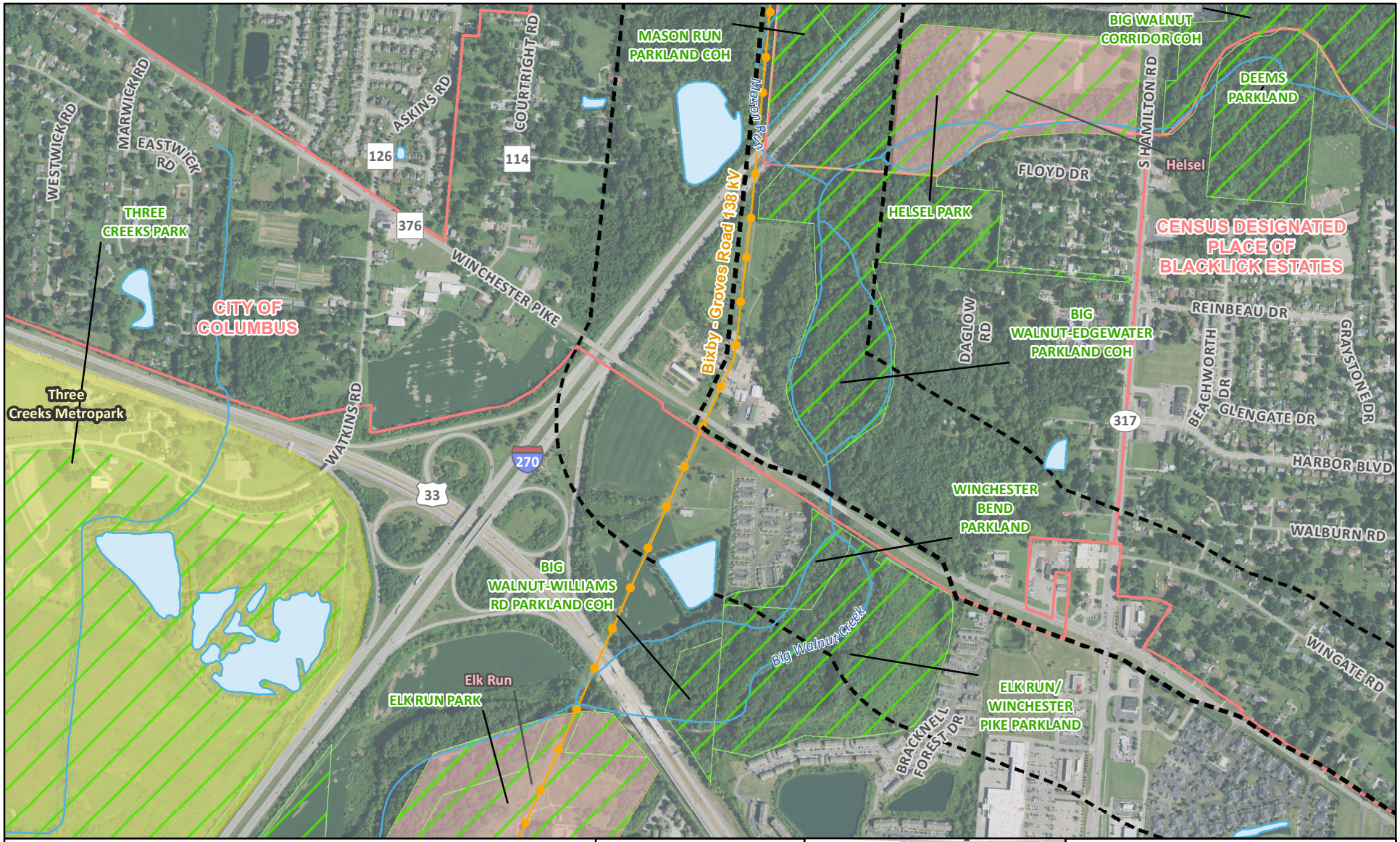


Figure 5-1G
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Alternate Route

Existing Transmission Line

138 kV

NHD Stream or River

1,000 Foot Buffer

NHD Waterbody

City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

Local Government

Regional Agency Special District

Township Boundary

Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

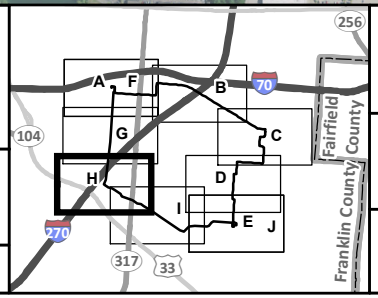
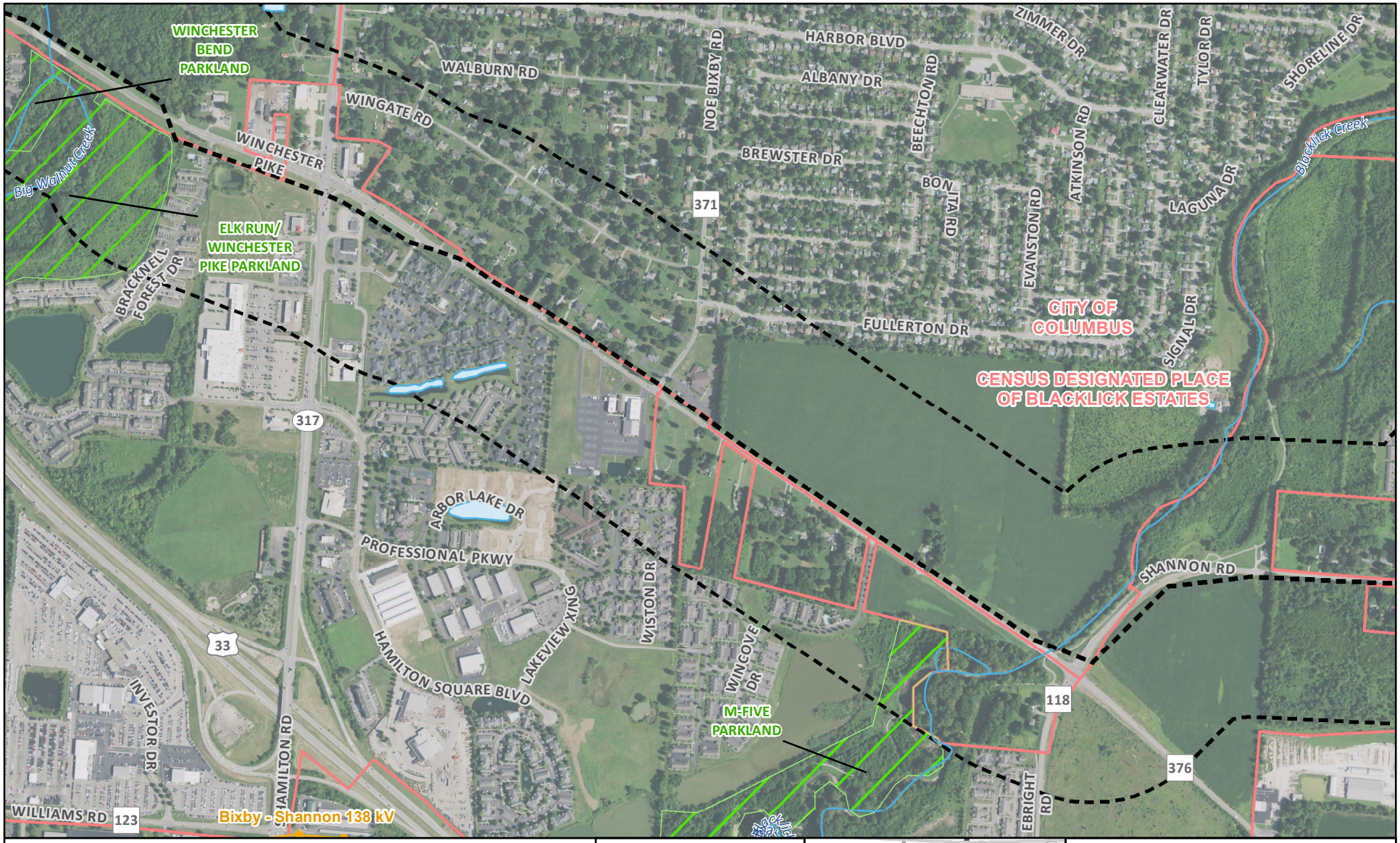


Figure 5-1H
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Alternate Route

Existing Transmission Line

- 138 kV
- NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- City of Columbus Park or Easement Boundary
- Township Boundary
- Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South NAD 83

March 03, 2022

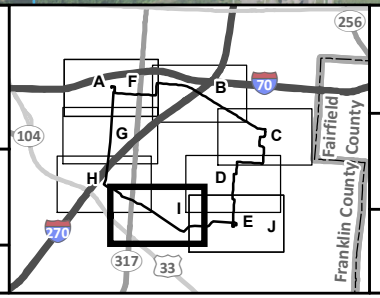
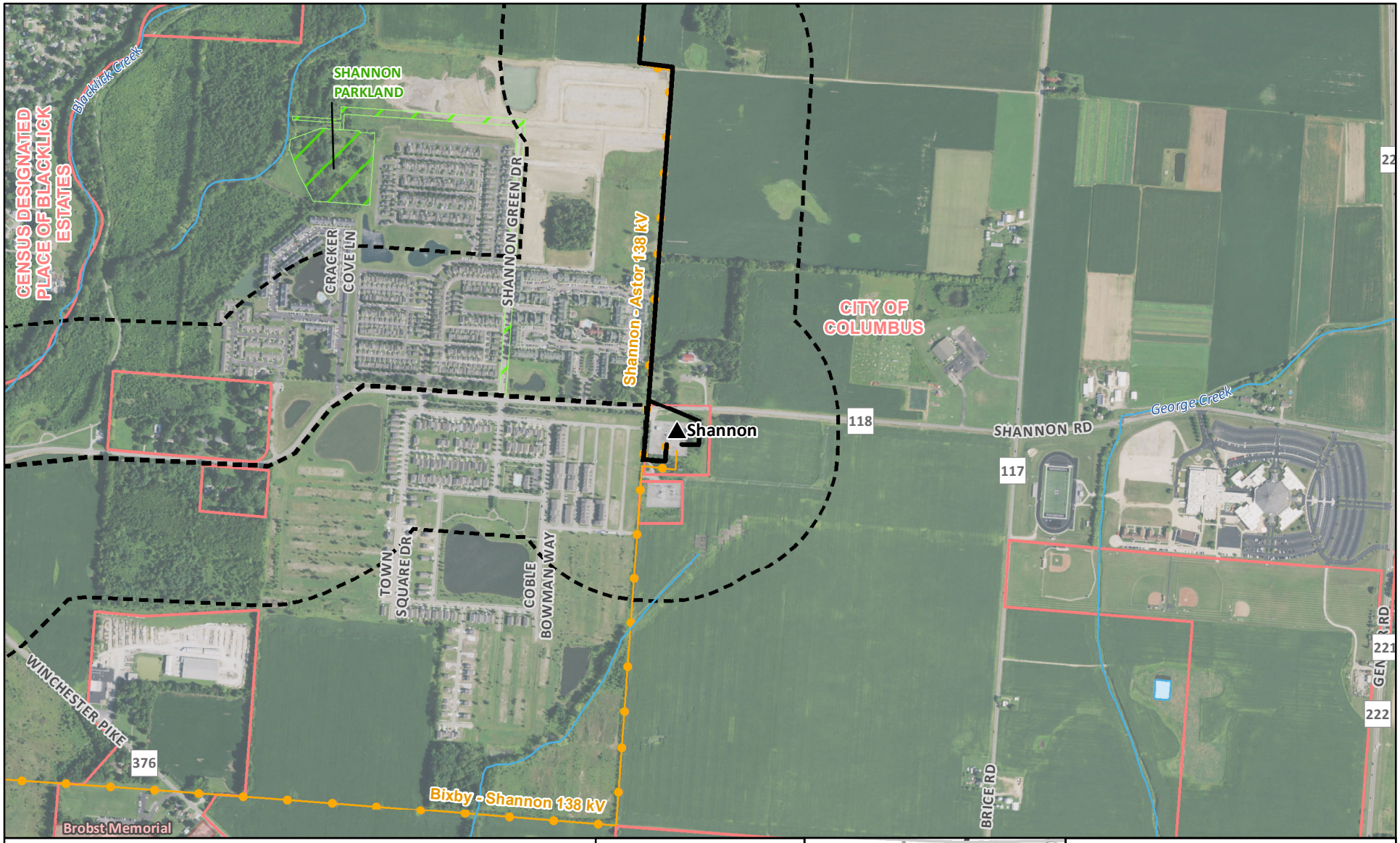


Figure 5-1l
Alternative Routes Overview

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
Blacklick Creek
SHANNON PARKLAND
CRACKER COVE LN
SHANNON GREEN DR
Shannon - Astor 138 kV
CITY OF COLUMBUS
Shannon
118
SHANNON RD
George Creek
117
TOWN SQUARE DR
COBLE BOWMAN WAY
WINCHESTER PIKE
376
Bixby - Shannon 138 kV
Brobst Memorial
BRICE RD
222
Existing Station
Preferred Route
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
City of Columbus Park or Easement Boundary
Protected Areas - Ownership Type
Local Government
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South NAD 83
March 03, 2022
Fairfield County
Franklin County
A
B
C
D
E
F
G
H
I
J
70
104
270
317
33
256
Figure 5-1J
Alternative Routes Overview
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV Transmission Line Project
0
1,000
2,000
Feet

APPENDIX 5-1:

Long-Term Forecast Report of the Company

PUCO Form FE-T9
AEP Ohio Transmission Company
Specifications of Planned Transmission Lines

LINE NAME AND NUMBER:	Groves - Shannon (s2282), TP2019017
POINTS OF ORIGIN AND TERMINATION	Groves, Shannon INTERMEDIATE STATION - N/A
RIGHTS-OF-WAY: LENGTH / WIDTH / CIRCUITS	5 mi / 100 ft / 1 circuit
VOLTAGE: DESIGN / OPERATE	138 kV/ 138 kV
APPLICATION FOR CERTIFICATE:	2021
CONSTRUCTION:	2023-2024
CAPITAL INVESTMENT:	$18M
PLANNED SUBSTATION:	N/A
SUPPORTING STRUCTURES:	Steel
PARTICIPATION WITH OTHER UTILITIES	N/A
PURPOSE OF THE PLANNED TRANSMISSION LINE	Rebuild of existing 138 kV line
CONSEQUENCES OF LINE CONSTRUCTION DEFERMENT OR TERMINATION	Increased risk of equipment failure.
MISCELLANEOUS:	

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-5-06 ECONOMIC IMPACT AND PUBLIC INTERACTION 6-2

(A) OWNERSHIP OF PROPOSED FACILITY 6-2

(B) ELECTRIC CAPITAL COST 6-2

(C) GAS CAPITAL COST 6-3

(D) PUBLIC INTERACTION INFORMATION 6-3

(1) Counties, Townships, Villages, and Cities Within 1,000 feet of the Preferred and Alternate Routes 6-3

(2) Public Officials Contacted 6-3

(3) Public Information Programs 6-3

(4) Liability Compensation 6-4

(5) Tax Revenues 6-5

Table 6-1. Estimates of Applicable Intangible and Capital Costs 6-2

4906-5-06 ECONOMIC IMPACT AND PUBLIC INTERACTION

(A) OWNERSHIP OF PROPOSED FACILITY

The Company will construct, own, operate, and maintain the proposed Groves Road-Shannon 138 kV Transmission Line.

(B) ELECTRIC CAPITAL COST

The Company developed estimates of the applicable intangible and capital costs for a variety of components of the Project. Each of the enumerated components is included in **Table 6-1**. The table also includes estimates of applicable intangible and capital costs for both the Preferred and Alternate Routes of the Project. The Preferred Route costs below include approximately 3 miles of double circuit construction, with the Shannon-Astor 138 kV line. If the Alternate Route was selected, rebuilding the single circuit Shannon-Astor 138 kV line would still be required; therefore a portion of the cost estimated, roughly $7,000,000, of the Preferred Route would be needed regardless, in order to construct the overall Southeast Columbus Area Improvement Projects. In addition, building double circuit provides some cost efficiencies by rebuilding both circuits at the same time, on ROW already acquired by the Company.

Table 6-1. Estimates of Applicable Intangible and Capital Costs

FERC Account Number	Description	Preferred Route	Alternate Route
350	Land and Land Rights	$2,431,668	$5,380,947
352	Structures and Improvements	-	-
353	Substation Equipment	-	-
354	Towers and Fixtures	-	-
355	Poles and Fixtures	$9,058,870	$5,218,803
356	Overhead Conductors and Devices	$1,729,990	$1,004,096
357	Underground Conductors and Insulation	-	-
358	Underground-to-Overhead Conversion Equipment	-	-
359	ROW Clearing and Roads, Trails or Other Access	$8,260,473	$6,187,589
	TOTAL	**$21,481,000**	**$17,791,435**

(C) GAS CAPITAL COST

This Application is for an electric transmission line; therefore, this section is not applicable.

(D) PUBLIC INTERACTION INFORMATION

This section of the application provides information regarding public interaction and the economic impact for each of the route alternatives.

(1) Counties, Townships, Villages, and Cities Within 1,000 feet of the Preferred and Alternate Routes

Madison and Truro Townships within Franklin County are crossed by both the Preferred and Alternate Routes. The Preferred Route is located within 1,000 feet of the City of Columbus and the Village of Brice. The Alternative Route is located within 1,000 feet of the City of Columbus and the Census Designated Place of Blacklick Estates. No other counties, townships, villages, or cities are located within 1,000 feet on either side of the Preferred and Alternate Routes.

(2) Public Officials Contacted

Appendix 6-1 provides a list of the local public officials, including their office addresses and office telephone numbers, who have been contacted to date and who will be provided a digital or hard copy of the Application.

(3) Public Information Programs

The Company mailed letters to landowners and elected officials, issued a public notice and a news release to the local media, created a Project website (https://aeptransmission.com/ohio/SoutheastColumbus/), hosted a virtual public open house program in November 2020, and hosted an in-person and virtual open house in December 2021.

During the construction of this Project, the Company will maintain Project updates on its website, retain ROW land agents to discuss Project timelines, construction and restoration activities, and convey this information to affected owners and tenants. Copies of informational materials available at the public open house is included in Appendix 6-2.

Throughout the duration of the Project, the public could contact Joe Demaree, Project Outreach Specialist, at 380-205-5046, or email jkdemaree@aep.com to ask questions or provide comments. To access the Project's website, please visit http://www.aeptransmission.com/ohio/ and click the Southeast Columbus Area Improvements Project link.

For copies of the Application, the public can do any of the following:

- Going to a local Columbus Metropolitan Library Branch (Reynoldsburg or Southeast Branch)
- Go to http://opsb.ohio.gov and search for this project's case number (Case No. 21-0199-EL-BTX)
- Access the project's website (https://aeptransmission.com/ohio/SoutheastColumbus) and follow the directions to obtain a copy.

On the Company's website, there is information on how to contact AEP representatives to express comments or questions regarding the Project.

The Company has logged comments and information provided through its public interaction program. This information can be shared with the OPSB Staff upon request.

At least 7 days prior to any construction activities, the Company will notify landowners or tenants by mail, telephone, or in person, depending on landowner preference.

(4) Liability Compensation

AEP's insurance program for construction and operation of the proposed facility is outlined below:

- The Company maintains bodily injury and property damage liability insurance with limits of at least $1,000,000 for each occurrence.
- The Company is a qualified self-insuring employer under the State of Ohio Worker's Compensation law. AEP maintains insurance as required by the Industrial Commission of Ohio statutes.

(5) Tax Revenues

The Preferred and Alternate Routes are located in Madison and Truro Townships within Franklin County. The local school districts, park districts, and fire departments will also receive tax revenue from the Project. The Company will pay property taxes on the utility facilities in each jurisdiction. The approximate annual property taxes associated with the Preferred and Alternate Routes over the first year after the Project is completed are $1,810,800 and $1,575,000 respectively.

Based on the 2021 tax rates, the following is an estimated distribution of taxes by township, county, and other tax districts:

Preferred Route

Franklin County	$343,500
Truro Township	$36,900
Columbus City	$50,300
Brice Corp	$4,600
Columbus City School District	$986,700
Groveport-Madison Local School District	$321,700
Columbus & Franklin County Public Library	$48,600
Columbus State Community College	$8,100
Eastland Joint Vocational School District	$10,400
TOTAL	**$1,810,800**

Alternate Route

Franklin County	$284,400
Madison Township (exc. Cw, Grvp, Obtz, Pick)	$4,200
Madison Township	$182,200
Columbus City	$23,500
Columbus City School District	$522,700
Groveport-Madison Local School District	$495,100
Columbus & Franklin County Public Library	$40,200
Columbus State Community College	$6,900
Eastland Joint Vocational School District	$15,800
TOTAL	**$1,575,000**

APPENDIX 6-1:

PUBLIC OFFICIALS CONTACTED AND

OFFICIALS TO BE SERVED A COPY OF CERTIFIED APPLICATION

Groves Road – Shannon 138 kV Transmission Line Project
Public Officials Contacted and Officials to be Served
A Copy of Certified Application

Franklin County Board of Commissioners
Ms. Erica C. Crawley, President
Mr. John O'Grady
Mr. Kevin L. Boyce
373 South High Street
Columbus, Ohio 45215
614-525-3322

Franklin County Engineer
Mr. Cornell R. Robertson, P.E., P.S.
970 Dublin Road
Columbus, Ohio 43215
614-525-3043

Franklin County Soil & Water Conservation District
Ms. Jennifer Fish, Director
1404 Goodale Boulevard, Suite 100
Columbus, Ohio 43212
614-486-9613

Village of Brice
Mr. John Mathys, Mayor
Mr. Josh Ford, Engineering
Mr. Jim McFarland, Zoning Officer
Ms. Patricia Stevens, Fiscal Officer
5990 Columbus Street, PO Box 65
Brice, Ohio 43109
614-864-8591

City of Columbus Council
Mr. Shannon Hardin, President
90 West Broad Street, 2nd Floor
Columbus, Ohio 43215
614-645-5291

Madison Township Trustees
Ms. Michele Reynolds, Chair
Ms. Katherine Chipps, Vice Chair
Mr. John Pritchard
4575 Madison Lane
Groveport, Ohio 43125
614-836-5308

Madison Township Fiscal Officer
Ms. Laurie Vermeer
4575 Madison Lane
Groveport, Ohio 43125
614-836-5308

Truro Township Trustees
Mr. Pat Mahaffey
Mr. Chris Long
Mr. Dennis Nicodemus
6900 East Main Street
Reynoldsburg, Ohio 43068
614-866-1317

Truro Township Fiscal Officer
Ms. Natalie Nicodemus
6900 East Main Street
Reynoldsburg, Ohio 43068
614-866-1317

Columbus Metropolitan Library
Mr. Patrick Losinski, CEO
96 South Grant Avenue
Columbus, Ohio 43215
614-849-1000

Groves Road – Shannon 138 kV Transmission Line Project
Public Officials Contacted and Officials to be Served
A Copy of Certified Application

City of Columbus Mayor
Mr. Andrew Ginther
90 West Broad Street, 2nd Floor
Columbus, Ohio 43215
614-645-7671

APPENDIX 6-2:

PUBLIC INFORMATION PROGRAMS

November 11, 2020

IMPORTANT INFORMATION ABOUT YOUR PROPERTY

«Owner_Name»
«Mailing_Address_MA»
«MA_City», «MA_State» «MA_Zip»

RE: Southeast Columbus Area Improvements Project Announcement & Virtual Open House Invitation

Dear Neighbor,

You are receiving this letter because you own property or live in the area where AEP Ohio representatives plan to upgrade the local power grid.

The Southeast Columbus Area Improvements Project involves:

- Building approximately 5 miles of 138-kilovolt (kV) transmission line between Groves and Shannon substations
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Astor and Shannon substations
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Bixby and Shannon substations
- Expanding Shannon Substation near the intersection of Shannon Road and Brice Road

The project helps increase electric reliability, reduce the likelihood of extended power outages and speed recovery of service when outages occur.

As a result of the COVID-19 pandemic and the social distancing recommendations made by the Centers for Disease Control and Prevention (CDC), you are invited to a virtual (online) open house to learn more and share your input, particularly on possible route options. Please visit **AEPOhio.com/SoutheastColumbus** to access project information, view an interactive map and submit comments through a "Contact Us" link. You can also complete the enclosed comment card and mail it back to us. **Please share your feedback by Friday, December 4**.

When sharing your input please feel free to include information about your property such as:

- Historically significant buildings or landmarks such as cemeteries
- Natural features such as wetlands or springs
- Future plans for your property

Please review the enclosed fact sheet for more information. Feel free to contact me if you have any questions.

Sincerely,

Brian Recker
Project Outreach Specialist
AEP Ohio
(380) 205-5381
brecker@aep.com

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY™

AEP Ohio representatives plan power grid upgrades to improve electric reliability for customers in southeast Columbus and Groveport. The Southeast Columbus Area Improvements Project involves building about 5 miles of electric transmission line, rebuilding about 9 miles of electric transmission line and expanding a substation.



WHAT

The project involves:

- Building approximately 5 miles of 138-kilovolt (kV) transmission line between Groves and Shannon substations
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Astor and Shannon substations
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Bixby and Shannon substations
- Expanding Shannon Substation near the intersection of Shannon Road and Brice Road

*This project requires Ohio Power Siting Board (OPSB) approval

WHY

The project:

- Strengthens the local electric transmission system
- Reduces the likelihood of power outages
- Speeds recovery of service when outages occur

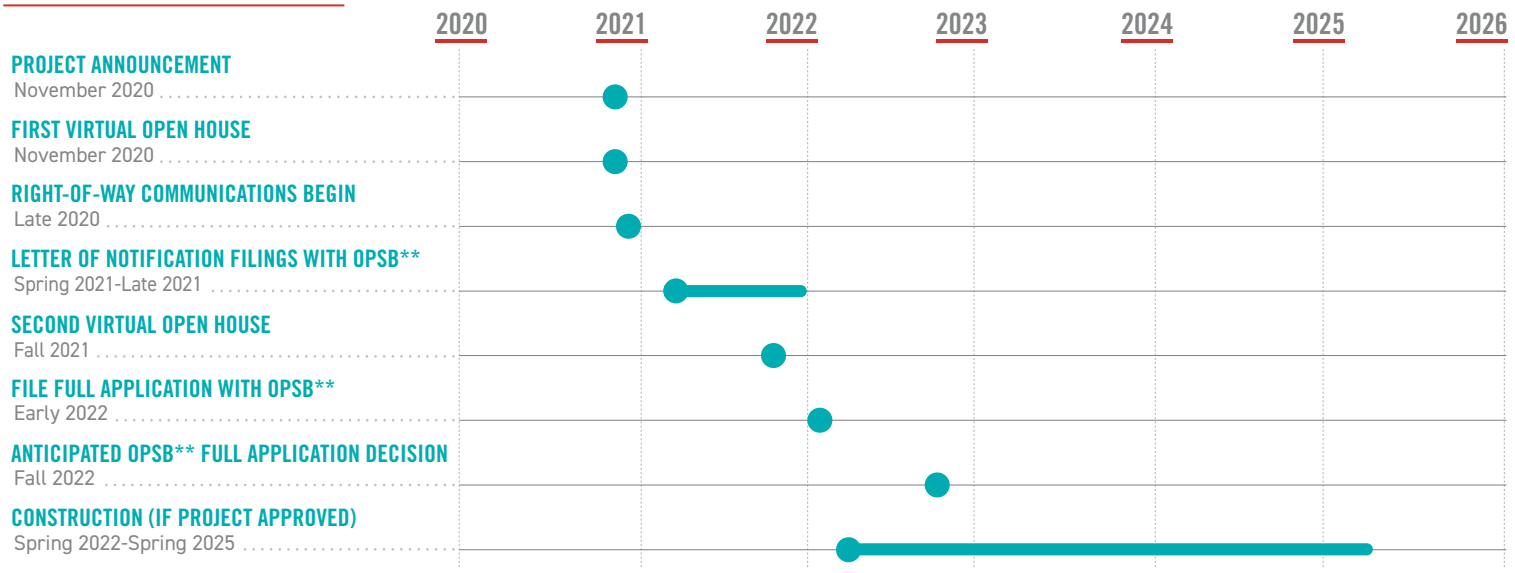
WHERE

The project area includes:

- City of Columbus
- City of Groveport
- Truro and Madison townships in Franklin County

We are requesting feedback on possible route options for the power lines. Your feedback is important to us and helps our team determine a power line route that minimizes impact to the community and environment.

PROJECT SCHEDULE



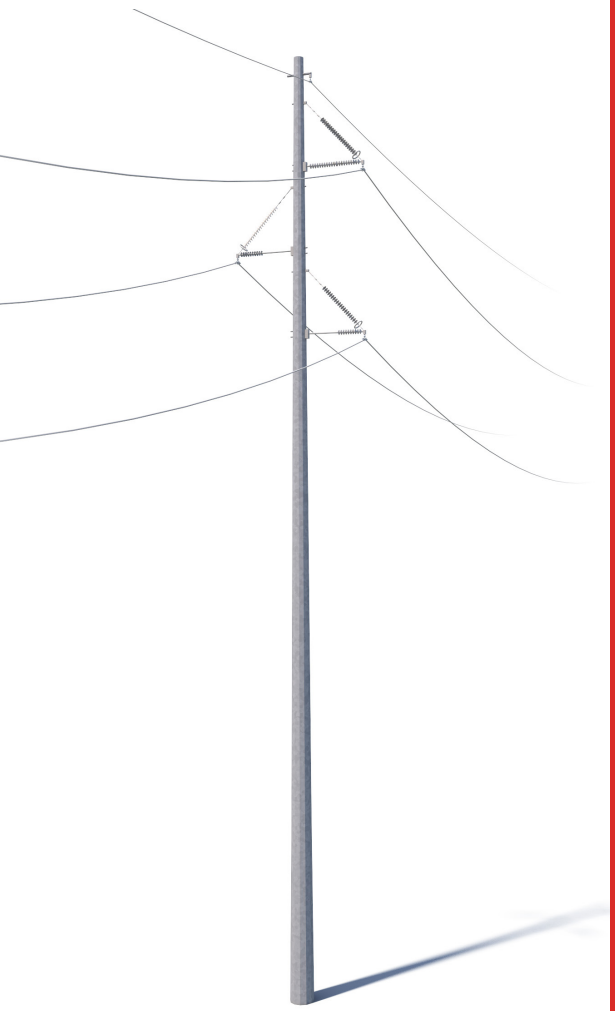
*Timeline subject to change
**Ohio Power Siting Board

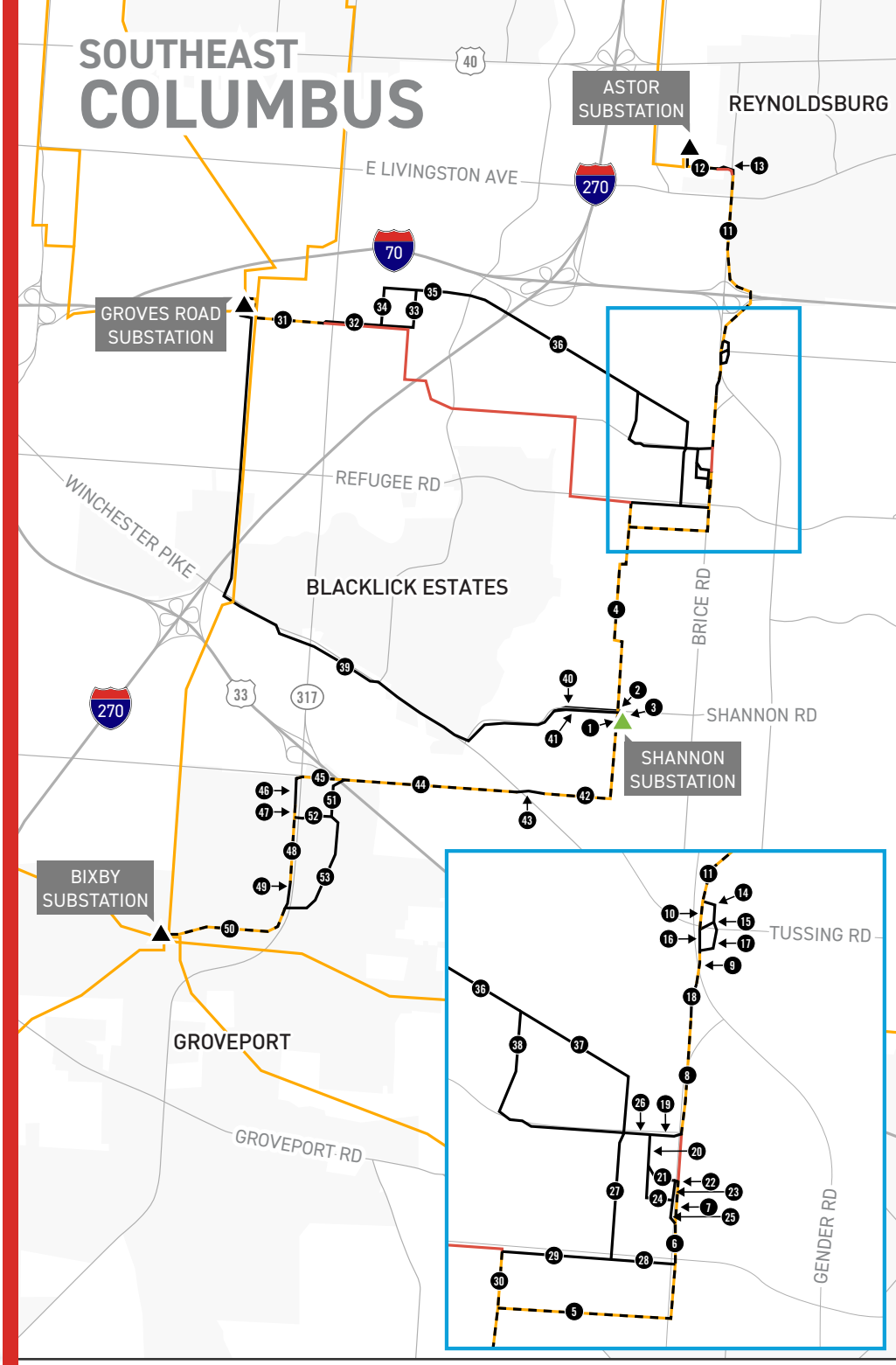
TYPICAL STRUCTURES

The project involves installing steel poles.

Structure Height: Approximately 90 feet*
Right-of-Way Width: Approximately 100 feet*

*Exact structure, height and right-of-way requirements may vary





SOUTHEAST COLUMBUS AREA IMPROVEMENTS PROJECT

- EXISTING TRANSMISSION LINE
- EXISTING TRANSMISSION LINE TO BE REBUILT
- STUDY SEGMENTS
- EXISTING SUBSTATION
- SUBSTATION TO BE EXPANDED
- TRANSMISSION LINE TO BE RETIRED

N

AEP OHIO VALUES YOUR INPUT ABOUT THIS PROJECT. PLEASE SEND COMMENTS AND QUESTIONS TO:

BRIAN RECKER
Project Outreach Specialist
380-205-5381
brecker@aep.com
AEPOhio.com/SoutheastColumbus

AEP OHIO
An AEP Company
BOUNDLESS ENERGY™

11/12/2020

AEP Ohio
8500 Smiths Mill Rd
New Albany, OH 43054

November 22, 2021

ATTN: IMPORTANT INFORMATION ABOUT YOUR PROPERTY
«Owner_Name»
«ADDRESS»
«CITY», «STATE» «ZIP»

RE: Notice of Public Information Meeting for a Proposed Major Utility Facility
AEP Ohio Transco, Inc.
Southeast Columbus Area Improvements Project Update & Open House Invitation
To be filed as Groves Road-Shannon 138 kV Transmission Line Project
Case No. 21-0199-EL-BTX

Dear Neighbor,

You are receiving this letter because public records indicate you own property or live near a proposed transmission line project. We are writing to update you on the next steps in the Southeast Columbus Area Improvements Project.

As you may recall in previous communications, the project involves:

- Building approximately 5 miles of 138-kilovolt (kV) transmission line between Groves Road and Shannon substations
- Rebuilding approximately 2 miles of 138-kV transmission line between Astor Substation and an existing power line off Brice Road (to be filed spring 2022)
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Bixby and Shannon substations (filed in September 2021 with the Ohio Power Siting Board (OPSB), Case No. 21-0850-EL-BLN)
- Expanding Shannon Substation near the intersection of Shannon Road and Brice Road

The 70-year-old transmission line has shown significant deterioration, caused multiple electrical outages during the past six years, and is unable to support continued growth in the area. Replacing the deteriorating equipment along the transmission line with modern equipment provides improved reliability and resiliency of the local electric system. These improvements reduce the amount and frequency of required maintenance and enhances the line's operational performance.

We are hosting an in-person and virtual open house and invite you to learn more and share input on the two route alternatives for the 5 miles of proposed power line between Groves Road and Shannon substations. These route alternatives are shown on the enclosed fact sheet. Please join us from **5:30 p.m. to 7:30 p.m.** on **Wednesday, December 15,** at **The Wigwam Event Center** located at **10190 Blacklick-Eastern Road in Pickerington.** Visitors can view detailed maps and talk with team members about the project. There is no formal presentation, so you can arrive at any time during the event.

At AEP Ohio, safety is our first priority. Due to COVID-19, AEP Ohio staff members plan to wear face coverings and practice social distancing at the open house to ensure safety for you and our staff. We encourage attendees to wear face coverings at the open house per the Centers for Disease Control and Prevention (CDC) guidance for vaccinated and unvaccinated individuals. We will provide masks and hand sanitizer at the open house. We ask that if you are experiencing fever, cough, body aches, or other COVID-19 symptoms, please stay home for the safety of your neighbors and our staff.

AEP Ohio
8600 Smiths Mill Rd
New Albany, OH 43054

If you are feeling unwell, you may visit the **VIRTUAL OPEN HOUSE at AEPOhio.com/SoutheastColumbus** to access information, view an interactive map, enter our virtual open house and submit comments through a "Contact Us" link.

If you prefer, you can share your input by using any of the additional communication methods below:

- Complete the enclosed comment card with your input and mail it back to Joe Demaree, Project Outreach Specialist for AEP Ohio, in the self-addressed, stamped envelope provided;
- Call Joe Demaree at (380) 205-5046;
- Send an email to Joe Demaree at: jkdemaree@aep.com;
- Send your comments directly to the OPSB at 180 East Broad Street, Columbus, OH 43215-3793. You may also visit opsb.ohio.gov or contact the OPSB at (866) 270-6772 or contactopsb@puc.state.oh.us.

When sharing your input on the two route options please feel free to include information about your property such as:

- Historically significant buildings or landmarks such as cemeteries;
- Natural features such as wetlands or springs;
- Future plans for your property.

In order to construct the project, AEP Ohio must obtain the approval of the OPSB. Following the public input period, the AEP Ohio project team prepares and submits an application to the OPSB that includes information on both a preferred and alternate route for the 5 miles of proposed power line between Groves Road and Shannon substations. Public feedback helps us finalize a preferred and alternate line route to submit to the OPSB early next year.

The OPSB is legally obligated to review the application and, if certain legal criteria are met, it may approve the project. OPSB approval is obtained through the issuance of a Certificate of Environmental Compatibility and Public Need. For more information on the OPSB, its composition and the process it follows in reviewing the application for the project, please visit www.opsb.ohio.gov. You can also contact OPSB staff via e-mail at contactopsb@puco.ohio.gov, by phone at 866-270-6722 or mailing correspondence to 180 East Broad Street, 11th Floor, Columbus, OH 43215.

A separate public hearing on the project will be scheduled in the future. You may request notice of the public hearing using any of the communication methods mentioned earlier in this letter. You can file a petition to intervene in the OPSB process with the siting board up to 30 days after the public hearing notice. The OPSB determines the final line route.

Please review the enclosed fact sheet for more information. Feel free to contact me if you have any questions.

Sincerely,

Joe Demaree

Joe Demaree
Project Outreach Specialist
AEP Ohio

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY™

AEP Ohio representatives plan power grid upgrades to improve electric reliability for customers in southeast Columbus and Groveport. The Southeast Columbus Area Improvements Project involves building about 5 miles of electric transmission line, rebuilding about 6 miles of electric transmission line and expanding a substation.



WHAT

The project involves:

- Building approximately 5 miles of 138-kilovolt (kV) transmission line between Groves Road and Shannon substations
- Rebuilding approximately 2 miles of 138-kV power line between Astor Substation and an existing power line off Brice Road
- Rebuilding approximately 4.5 miles of 138-kV transmission line between Bixby and Shannon substations
- Expanding Shannon Substation near the intersection of Shannon Road and Brice Road

*This project requires Ohio Power Siting Board (OPSB) approval

WHY

The project:

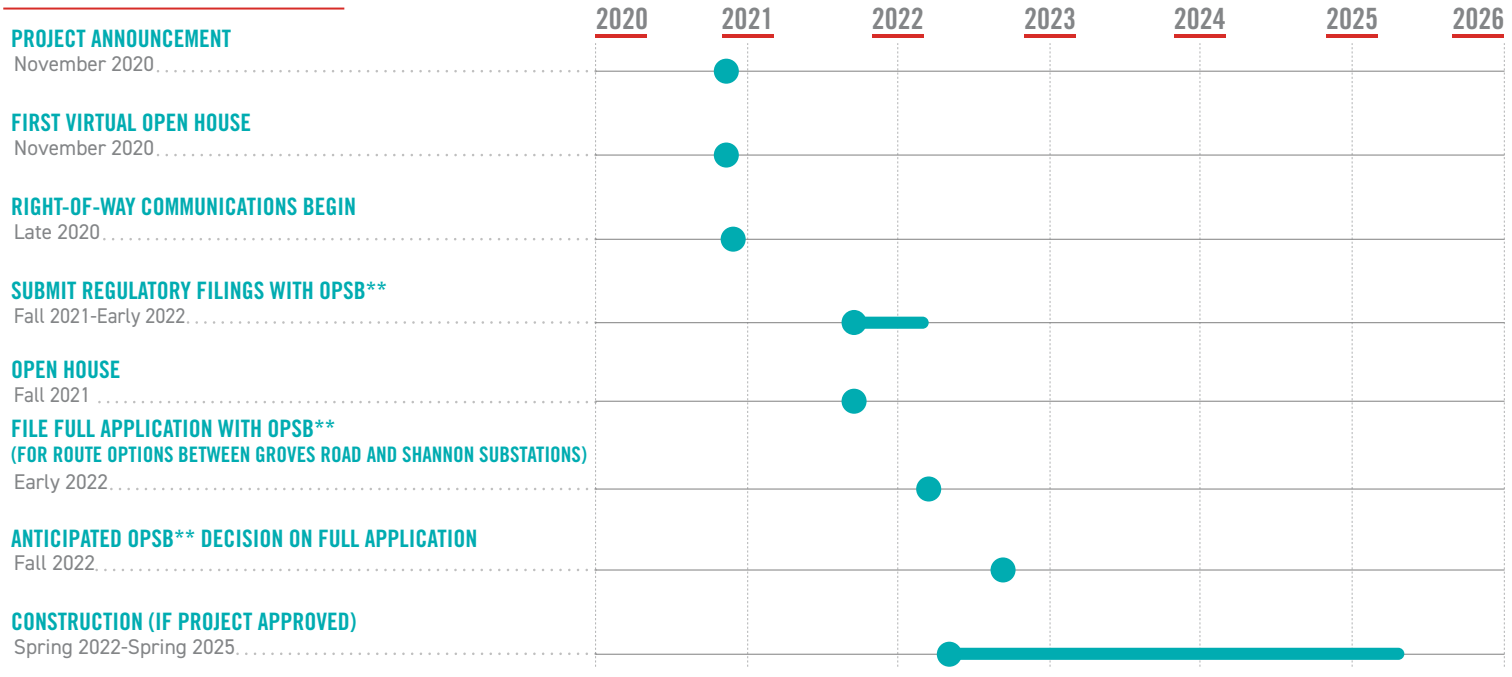
- Strengthens the electric transmission system by replacing wooden poles from the 1950s with steel poles
- Reduces ongoing maintenance of the existing power line
- Improves operational performance by installing modern equipment
- Reduces the likelihood of extended power outages
- Speeds recovery of service when outages occur

WHERE

The project area includes:

- City of Columbus
- City of Groveport
- Truro and Madison townships in Franklin County

PROJECT SCHEDULE



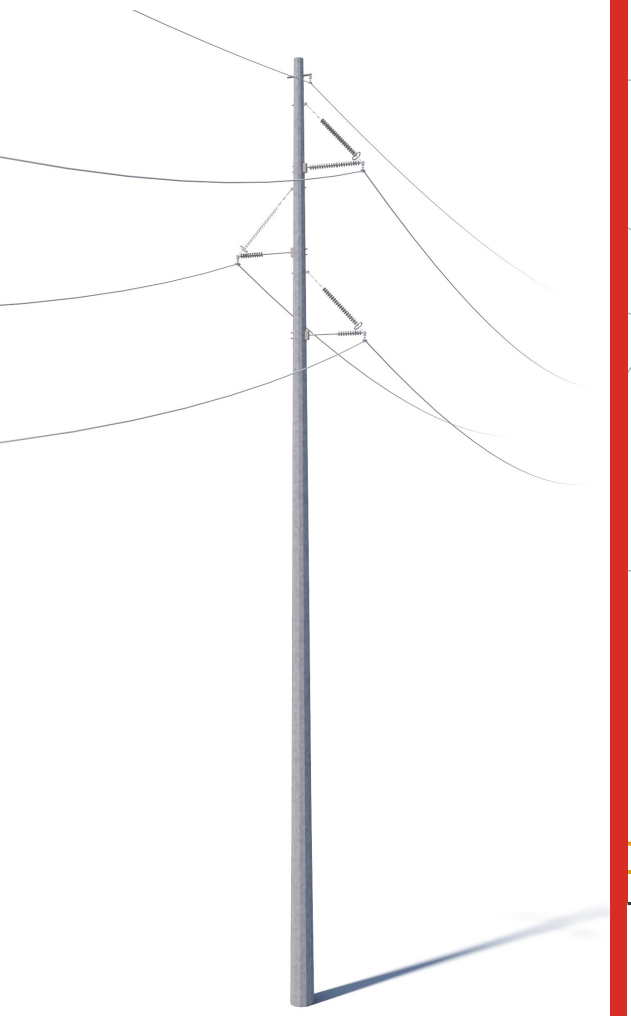
*Timeline subject to change
**Ohio Power Siting Board

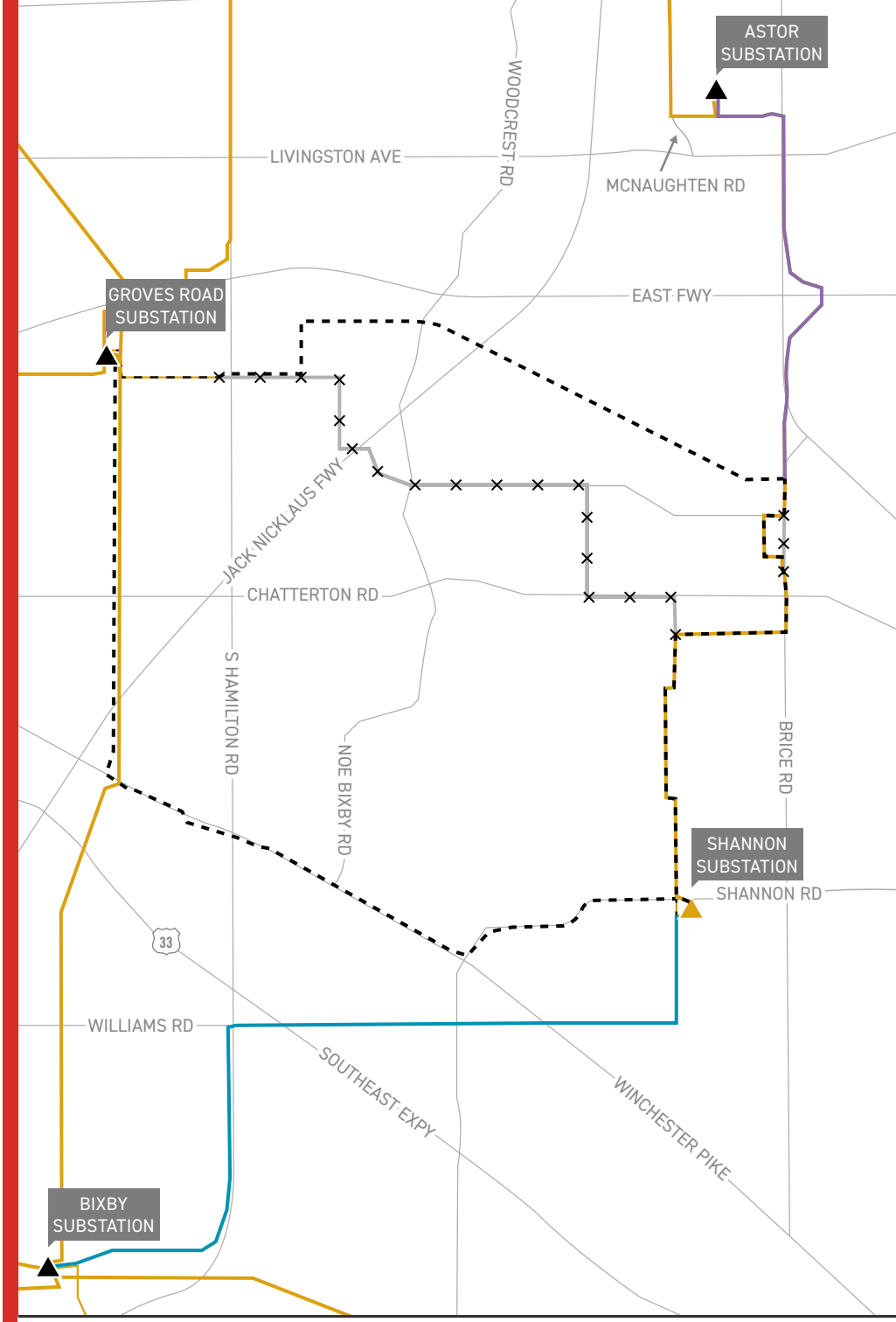
TYPICAL STRUCTURES

The project involves installing steel poles.

Structure Height: Approximately 90 feet*
Right-of-Way Width: Approximately 60 feet*

*Exact structure, height and right-of-way requirements may vary





SOUTHEAST COLUMBUS AREA IMPROVEMENTS PROJECT

- EXISTING TRANSMISSION LINE
- TRANSMISSION TO BE FILED IN 2022
- ROUTE ALTERNATIVES
- TRANSMISSION LINE REBUILD FILED WITH OPSB*
- TRANSMISSION LINE TO BE RETIRED
- EXISTING SUBSTATION
- SUBSTATION TO BE EXPANDED

N

*OPSB: Ohio Power Siting Board

AEP OHIO VALUES YOUR INPUT ABOUT THIS PROJECT. PLEASE SEND COMMENTS AND QUESTIONS TO:

JOE DEMAREE
Project Outreach Specialist
380-205-5046
jkdemaree@aep.com
AEPOhio.com/SoutheastColumbus

AEP OHIO
An AEP Company
BOUNDLESS ENERGY™

11/23/2021

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: Cheryl LaPat

ADDRESS: 6011 Astor Ave Columbus, Ohio 43232

EMAIL: _____ PHONE: 614-861-4525

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☐ Yes ☐ No

If no, please explain

_____

_____

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

"One of the route alternatives are on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this route alternative," and "There is a family cemetery located along one of the route alternatives approximately 100 feet west of 345 Briad Street."

☐ House, shed or other structure

_____

_____

☐ Springs, streams, wetlands, sensitive species or protected areas

_____

_____

_____

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

☐ Cave, sinkhole, mine or portal

☐ Approved or documented planned project

☐ Existing conservation easement

☐ Historical or archaeological feature (i.e. homestead, Native American site)

☑ Underground utilities or pipelines (including gas, water, oil, etc.)

I have an underground drain system that drains water from around my house out to the street close to the electric pole

☑ Agricultural features including irrigation systems, drainage tiles, etc.

Same as above

☐ Other land use such as private airstrips, past landfills or buried waste, radio or cellular antennas

☐ Additional Comments

Ledger - 137
Map 2,3

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: DANIEL CAVEDA

ADDRESS: 3142 NOE BIXBY RD

EMAIL: esilses@icloud.com PHONE: (614) 226-4221

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☒ Yes ☐ No

If no, please explain

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

"One of the route alternatives are on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this route alternative," and "There is a family cemetery located along one of the route alternatives approximately 100 feet west of 345 Briad Street."

☑ House, shed or other structure

A COMMERCIAL STRUCTURE 30 FT IS IN THE PROJECT AREA

☑ Springs, streams, wetlands, sensitive species or protected areas

I WILL LOOSE MY TREES ON THE LINE AND THE PRIVACY BUSHES. BAD.

Lectge - 750
Map - 6

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: ERIC J ZIDEL

ADDRESS: 4575 WINCHESTER PIKE

EMAIL: EZIDEL1@YAHOO.COM PHONE: 614-774-8696

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☑ Yes ☐ No

If no, please explain

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

"One of the route alternatives are on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this route alternative," and "There is a family cemetery located along one of the route alternatives approximately 100 feet west of 345 Briad Street."

☐ House, shed or other structure

White picket FENCES, BUSINESS SIGNS (x2)
Multiple mature tree's

☐ Springs, streams, wetlands, sensitive species or protected areas

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: _____

ADDRESS: _____

EMAIL: ~~jcmohler~~ jcmohler@aep.com PHONE: _____

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☐ Yes ☐ No

If no, please explain

Does existing line on east side of 446; map 2 have distribution. Will line be topped or removed also 228, 229,

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

"One of the route alternatives are on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this route alternative," and "There is a family cemetery located along one of the route alternatives approximately 100 feet west of 345 Briad Street."

☐ House, shed or other structure

☐ Springs, streams, wetlands, sensitive species or protected areas

- [ ] Cave, sinkhole, mine or portal

- [ ] Approved or documented planned project

- [ ] Existing conservation easement

- [ ] Historical or archaeological feature (i.e. homestead, Native American site)

- [ ] Underground utilities or pipelines (including gas, water, oil, etc.)

- [ ] Agricultural features including irrigation systems, drainage tiles, etc.

- [ ] Other land use such as private airstrips, past landfills or buried waste, radio or cellular antennas

- [ ] Additional Comments

Lodge -78
map - 6

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: Matt Biggert

ADDRESS: 4612 Winchester Pike

EMAIL: _____ PHONE: 614 834 8857

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☑ Yes ☐ No

If no, please explain

_____

_____

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

There is a high pressure gas line and the twisted pair copper from ATT 83X on the south side of Winchester Pike. There were 6 utility marks made when adding ATT fiber optic for Shannon Rd on the north side of WP.

☐ House, shed or other structure

_____

_____

☐ Springs, streams, wetlands, sensitive species or protected areas

_____

_____

_____

SOUTHEAST COLUMBUS
AREA IMPROVEMENTS PROJECT

Ledger - 759
map - 6
12-17-21
POSTMARK

AEP OHIO
An AEP Company
BOUNDLESS ENERGY

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by December 20, 2021. If you prefer to provide comments online, visit AEPOhio.com/SoutheastColumbus and click the "Contact Us" button.

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: Winnie Young

ADDRESS: 3809 Battersea Dr

EMAIL: wyoung3883@yahoo.com PHONE: 614-867-8715

12/16/2021

Please complete this questionnaire after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☒ Yes ☐ No

If no, please explain

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

☑ Example

"One of the route alternatives are on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this route alternative," and "There is a family cemetery located along one of the route alternatives approximately 100 feet west of 345 Briad Street."

☒ House, shed or other structure

Condo located in Waterford Harbour Condo community

☒ Springs, streams, wetlands, sensitive species or protected areas

Proposed route crosses Walnut Creek

AEP OHIO

AEP | BOUNDLESS ENERGY

- [x] Cave, sinkhole, mine or portal

Proposed southern Route would cross 2 entrances to Condo Community

- [ ] Approved or documented planned project

- [ ] Existing conservation easement

- [x] Historical or archaeological feature (i.e. homestead, Native American site)

Proposed southern Rt would run along cemetary

- [x] Underground utilities or pipelines (including gas, water, oil, etc.)

There have been significant upgrades to gas, fiber optics along Winchester Pike the last 2 years.

- [ ] Agricultural features including irrigation systems, drainage tiles, etc.

- [x] Other land use such as private airstrips, past landfills or buried waste, radio or cellular antennas

Proposed Southern Rt would run along 2 churches and a professional medical office.

- [x] Additional Comments

The proposed Norther Route would be less disruptive to residents since ~~my~~ majority of route is along existing railroad line.

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

Table of Contents

4906-05-07 HEALTH AND SAFETY, LAND USE, AND REGIONAL DEVELOPMENT 7-1

(A) HEALTH AND SAFETY INFORMATION FOR EACH ALTERNATE ROUTE .. 7-1

(1) How the facility will Comply with State/Federal Regulations 7-1

(2) Electric and Magnetic Fields..... 7-2

(3) Provide Estimate of the Level of Radio, Television, and Communications Interference from Operation of Facility. Identify Mitigation if Needed. 7-9

(4) Noise Generation from Construction, Operations, and Maintenance of the Transmission Line..... 7-10

(B) LAND USE 7-11

(1) Map of Land Use..... 7-11

(2) Impact of Facility on Each Land use 7-11

(3) Impact on Identified Nearby Structures 7-15

(C) AGRICULTURAL DISTRICTS AND IMPACTS TO AGRICULTURAL LAND 7-18

(1) Agricultural Land Use/Districts Map..... 7-18

(2) Impacts to Agricultural Lands and Agricultural Districts..... 7-18

(D) REGIONAL LAND USE PLANS AND DEVELOPMENT..... 7-21

(1) Impacts to Regional Development..... 7-21

(2) Compatibility of Proposed Facility with Current Regional Land Use Plans 7-21

(E) CULTURAL AND ARCHAEOLOGICAL RESOURCES..... 7-21

(1) Cultural Resources Map..... 7-22

(2) Cultural Resources in Study Corridor..... 7-22

(4) Mitigation Procedures 7-23

(5) Aesthetic Impact 7-23

Table 7-1. Grounding Clearances, Right-of-Way, and Projected Loading..... 7-4

Table 7-2. Magnetic Fields from Household Electrical Appliances and Devices 7-4

Table 7-3. Acreage and Percent of Land Uses..... 7-12

Table 7-4. Structures within 200 feet of Proposed 60-foot Right of Way..... 7-16

4906-05-07 HEALTH AND SAFETY, LAND USE, AND REGIONAL DEVELOPMENT

(A) HEALTH AND SAFETY INFORMATION FOR EACH ALTERNATE ROUTE

Health and safety considerations of the proposed Project were reviewed as part of this Application and summarized below.

(1) How the facility will Comply with State/Federal Regulations

The construction and operation of the Project will comply with the requirements specified in the National Electrical Safety Code ("NESC"), the Public Utilities Commission of Ohio ("PUCO"), and will meet all applicable safety standards established by the Occupational Health and Safety Administration ("OSHA").

Safety is the highest priority for the Company. Our priority towards employee and public safety is exemplified by the Company's policy as stated in the Company Safety Manual:

> *The Company system holds in high regard the safety and health preservation of its employees. Accidents injure people, damage equipment, destroy materials, and cause needless personal suffering, inconvenience, and expense. We believe, "No operating condition or urgency of service can ever justify endangering the life of anyone."*
>
> *To this end, we will constantly work toward the following:*
>
> - *The maintenance of safe and healthful working conditions,*
> - *Consistent adherence to proper operating practices and procedures designed to prevent injuries and illnesses,*
> - *Conscientious observance of governmental and company safety regulations.*

The Company also administers a contractor safety program. Contractors working for the Company are required to maintain internal safety programs and to provide safety training.

(2) Electric and Magnetic Fields

In accordance with the OPSB requirements specified in O.A.C. 4906-5-07(A)(2), the following subsections discuss the analysis of electric and magnetic fields ("EMF") associated with the Project.

(a) Calculated Electric and Magnetic Field Strength Levels

Three loading conditions were examined along the Preferred Route: (1) Normal Maximum Loading, (2) Emergency Loading, and (3) Winter Normal Conductor Rating, consistent with the OPSB requirements. Normal Maximum Loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter normal (WN) conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. **It is not anticipated that this circuit of this line would operate at its WN rating in the foreseeable future.**

EMF levels were computed one meter above ground under the line and at the ROW edges (30/30 feet, left/right, of centerline). The Company's results, calculated using EPRI's EMF Workstation 2015 software, are summarized in **Table 7-1**.

Table 7-1. Ground Clearances, Right-of-Way, and Projected Loading					
Condition	**Load (A)**	**Phasing Arrangements**	**Ground Clearance (feet)**	**Electric Field (kV/m)[a]**	**Magnetic Field (mG)[a]**
Normal Max. Loading^	233.04	A-B-C	35.62	0.38/0.92/0.54	21.45/44.28/27.94
Emergency Line Loading^^	532.18	A-B-C	33.43	0.40/1.02/0.56	25.85/48.39/34.34
Winter Conductor Rating^^^	1359.74	A-B-C	35.62	0.38/0.92/0.54	61.99/102.98/69.79

Notes:
^ Peak line flow expected with all system facilities in service.
^^ Maximum flow during a critical system contingency
^^^Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions.
[a] EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 30 feet (left) and 30 feet (right) of centerline, respectively.

For power-frequency EMF, Institute of Electrical and Electronics Engineers (IEEE) Standard C95.6TM-2002 recommends the following limits:

	General Public	Controlled Environment
	---	---
Electric Field Limit (kV/m)	5.0	20.0
Magnetic Field Limit (mG)	9,040	27,100

The above EMF levels are well within the limits specified in IEEE Standard C95.6TM-2002. Those limits have been established to "prevent harmful effects in human beings exposed to electromagnetic fields in the frequency range of 0-3 kHz

(b) Current State of EMF Knowledge

Electric and magnetic fields occur naturally in the environment. An electric field is present between the earth and its atmosphere and can discharge as lightning during thunderstorms. The earth also has a magnetic field, which provides an operating basis for the magnetic compass. EMF exists wherever there is a flow of electricity, including electrical appliances and power equipment.

Electric fields are produced by voltage or electric charge. A lamp cord that is plugged in produces an electric field even if the lamp is turned off. These fields commonly are measured in kilovolts per meter (kV/m); higher voltages produce stronger electric fields. Magnetic fields are created by the flow of current in a wire. As current increases, the magnetic field strength also increases; these fields are measured in units known as gauss, or milligauss (mG).

Electric fields are blocked by trees, shrubs, buildings, and other objects. Magnetic fields are not easily blocked and can pass through most objects. The strength of these fields decreases rapidly with distance from the source.

Possible health effects from exposure to EMF have been studied for several decades. Initial research, focused on electric fields, found no evidence of biologic changes that could lead to adverse health effects. Subsequently, a large number of epidemiologic studies examined the possible role of magnetic fields in the development of cancer and other diseases in adults and children. While some studies have suggested an association between magnetic fields and certain types of cancer, researchers have been unable to consistently replicate those results in other studies. Similarly, inconclusive or inconsistent results have been reported in laboratory studies of animals exposed to magnetic fields that are representative of common human exposures. A summary of such exposures, found in residential settings, is provided in **Table 7-2**.

Table 7-2. Magnetic Fields from Household Electrical Appliances and Devices

Appliance Type	Number of Devices	Magnetic Field (mG)		
		1.2 inches (0.1 feet)	12 inches (1.0 feet)	User Distance
AC Adapters	3	1.4 – 863	0 -7.5	0 – 0.8
Blood Pressure Monitors	4	4.2 – 39.6	0 – 0.3	0 -0.2
Bluetooth Headsets	3	0	0	0
Coffee Grinders	3	60.9 – 779	0.3 – 6.5	0.8 – 40.9
Compact Fluorescent Bulbs	15	0 – 32.8	0 – 0.1	0 – 0.6
Compact Fluorescent Bulb Ballast	1	8.5 – 23.5	0 – 0.1	0 -0.1

Table 7-2. Magnetic Fields from Household Electrical Appliances and Devices				
Appliance Type	**Number of Devices**	**Magnetic Field (mG)**		
		1.2 inches (0.1 feet)	**12 inches (1.0 feet)**	**User Distance**
Computers, Desktop	3	3.8 – 68.9	0 – 1.1	0.1 – 0.5
Computers, Laptop	4	0 – 5.1	0	0 – 0.1
Digital Cameras	3	0	0	0
Digital Photo Frames	5	0	0	0
Digital Video Recorders	4	0 – 29.6	0 – 0.2	0
Dimmer Switches	4	11.5 – 32.1	0 – 0.8	0 – 0.8
DVD Players	5	0 – 28.9	0 – 0.5	0
Electric Lawn Mower	1	1939	156	14.1
Electric Leaf Blowers	4	272 – 4642	17.1 - 155	28.3 – 61.5
Electric Toothbrushes	5	3.6 – 742	0 – 4.8	3.6 - 742
Electric Toothbrush Chargers	5	0 – 4.2	0	0
External Hard Drives	4	0.6 – 1.7	0	0
Gaming Consoles	10	0 – 215	0 – 0.5	0 – 0.6
GPS, Handheld	5	0 – 0.1	0	0
Hobby Tools	2	126 – 438	1.4 – 2.4	1.4 – 438
Hot Glue Guns	3	0 – 0.9	0	0
LCD Computer Monitors	4	0 – 4.5	0	0
LCD Televisions	4	1.1 – 3.9	0 – 2.5	0 – 0.6
Massagers/Massage Chairs	3	81.9 – 500	0.6 – 2.3	214 – 500
MP3 Players	5	0	0	0
Noise Cancellation Headphones	1	0	0	0

Table 7-2. Magnetic Fields from Household Electrical Appliances and Devices				
Appliance Type	**Number of Devices**	**Magnetic Field (mG)**		
		1.2 inches (0.1 feet)	**12 inches (1.0 feet)**	**User Distance**
Paper Shredders	4	11.0 – 4841	0.5 – 102	0.5 – 33.4
Plasma Televisions	2	45.1 – 73.6	1.4 – 2.2	0 – 0.1
Power Tools – Corded	3	784 – 982	8.8 – 31.3	46.8 - 123
Power Tools – Cordless	6	9.0 – 227	0 – 2.2	0 – 13.7
Printers	5	0.1 – 6.2	0 – 0.3	0 – 0.3
Scanners	3	0.6 – 6.7	0 – 0.3	0
Security System Panels	3	0 – 0.3	0	0
Tankless Hot Water Heater	1	10.1 – 21.9	1.2	0.2
Track Lighting	5	0.2 – 4.0	0 – 0.3	0
Vacuum Cleaners, Personal/Car	3	75.5 – 2226	0.6 – 23.3	0.1 – 23.1
Wireless Game Controllers	11	0	0	0
Wireless Routers	4	0 – 0.5	0	0 – 0.3
Source: Electric Power Research Institute, 2010				

As part of the National Energy Policy Act of 1992, U.S. Congress enacted the Electric and Magnetic Fields Research and Public Information Dissemination (EMF RAPID) program. The National Institute of Environmental Health Sciences (NIEHS) was charged with overseeing the health research and conducting an EMF risk evaluation. In its final report to Congress, issued in 1999, NIEHS concluded that power-frequency "EMF exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard." Nonetheless, the report stated that "this finding is insufficient to warrant aggressive regulatory concern." (NIEHS, 1999).

In 2001, the Standing Committee on Epidemiology of International Commission on Non-Ionizing Radiation Protection (ICNIRP) wrote in its review of the epidemiologic literature on EMF and health that "given the methodological uncertainties and in many cases inconsistencies of the existing epidemiologic literature, there is no chronic disease outcome for which an etiological [causal] relation to EMF exposure can be regarded as established." (ICNIRP, 2001)

Also, in 2001, International Agency for Research on Cancer (IARC) published the results of an EMF health risk evaluation conducted by an expert scientific working group, which concluded that power-frequency "magnetic fields are 'possibly carcinogenic to humans,' based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukemia" (IARC, 2001). IARC assigns its "possibly carcinogenic to humans" classification (Group 2B) if there is "limited evidence" of carcinogenicity in both humans and experimental animals, or if there is "sufficient evidence" in animals, but "inadequate evidence" in humans. Group 2B includes some 285 "agents" such as coffee, pickled vegetables, carpentry, textile manufacturing and gasoline, among others.

A comprehensive assessment of the EMF health risks was published by the World Health Organization (WHO) in 2007. In its assessment, WHO wrote: "Scientific evidence suggesting that every day, chronic, low-intensity (above 0.3-0.4 μT) [3-4 mG] power-frequency magnetic field exposure poses a possible health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia" (WHO, 2007). It added, however, that "virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF [extremely low frequency] magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern."

Regarding acute effects, WHO noted, "Acute biological effects have been established for exposure to ELF electric and magnetic fields in the frequency range up to 100 kHz that may have adverse consequences on health. Therefore, exposure limits are needed. International guidelines exist that have addressed this issue. Compliance with these guidelines provides adequate protection for acute effects" (WHO, 2007).

In summary, some studies have reported an association between long-term magnetic field exposure and particular types of health effects, while other studies have not. The nature of the reported association remains uncertain as no known mechanism or laboratory animal data exist to support the cause-and-effect relationship.

In view of the scientific evidence, the IEEE and other organizations have established guidelines limiting EMF exposure for workers in a controlled environment and for the general public. These guidelines focus on prevention of acute neural stimulation. No limits have been established to address potential long-term EMF effects, as the guideline organizations consider the scientific evidence insufficient to form the basis for such action. For power-frequency EMF, IEEE Standard C95.6™-2002 recommends the following limits (IEEE, 2002):

	General Public	Controlled Environment
Electric Field Limit (kV/m)	5.0	20.0*
Magnetic Field Limit (mG)	9,040	27,100

*10.0 kV/m within power line ROW.

To address public concerns about EMF, the Government of Canada in 2012 updated its website with the latest knowledge on the subject. It contains the following statements on the EMF health-related risks: “Health Canada does not consider that any precautionary measures are needed regarding daily exposures to EMFs at ELFs. There is no conclusive evidence of any harm caused by exposures at levels found in Canadian homes and schools, including those located just outside the boundaries of power line corridors” (Healthy Canadians, 2012). Similarly, in 2013, the updated website of the WHO concludes: “to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health” (WHO, 2013).

The Company has been following the EMF scientific developments worldwide, participating in and sponsoring EMF studies, and communicating with customers and employees on the subject. In addition, the Company is a member of EPRI, an independent, non-profit organization sponsoring and coordinating EMF epidemiological, laboratory and exposure studies.

(c) Description of the Company's Consideration of EMF Strength Levels

The Company did not consider design alternatives due to EMF and their strength levels. Transmission lines, when energized, generate EMF. Laboratory studies have failed to establish a strong correlation between exposure to EMF and effects on human health. However, some people are concerned that EMF has impacts on human health. Due to these concerns, EMF associated with the new circuits was calculated in the table above. The EMF was computed assuming the highest possible EMF values that could exist along the proposed transmission line. Normal daily EMF levels will operate below these maximum load conditions. Based on studies from the National Institutes of Health, the magnetic field (measured in milliGauss, or mG) associated with emergency loading at the highest EMF value for this transmission line, is lower than those associated with normal household appliances like microwaves, electric shavers and hair dryers. For additional information regarding EMF, the National Institute of Health has posted information on their website:

https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

(d) EMF Public Inquires Policy

Information on electric and magnetic fields is available on AEP Ohio's website at https://www.aepohio.com/info/projects/emf/; this information describes the basics of electromagnetic field theory, scientific research activities, and EMF exposures encountered in everyday life. Similar material will be made available for those affected by the construction activities during this Project.

The Company occasionally receives requests from customers for EMF measurements on their properties. These measurements are provided free of charge to the customers.

(3) Estimate of Radio, Television, and Communications Interference from Operation of Facility

Radio interference can be experienced in the AM broadcast band (535-1605 kilohertz [kHz]) and FM band (88-108 megahertz [MHz]), caused by transmission line gap-type discharge (1-1000 MHz). Dielectric discharge due to air ionization, known as corona, is not a concern with 138 kV

transmission planned in this Project. Gap-type discharge, such as that emitted by loose or defective transmission hardware, typically is localized and can be readily detected and corrected, or additional mitigation measures can be applied to eliminate the interference source.

Today's digital television signals react differently to interference than the pre-2009 analog signals. Common problems with analog television included ghosting of images, noise from weak signals, and other problems, which degraded the quality of the image and sound, although the programming was still watchable. With digital television, reception of the signal must be very nearly complete. Otherwise, audio and video are not usable. Television signals, which are transmitted at frequencies above 50 MHz, can be affected by gap discharged if received from air broadcasts (by "rabbit ears"). These problems have largely been addressed with the use of cable television.

(4) Noise Generation from Construction, Operations, and Maintenance of the Transmission Line

(a) Blasting Activities

Dynamiting and blasting activities will not occur during construction of the Project.

(b) Operation of Earth Moving and Excavating Equipment

During the construction phase of the transmission line installation, a temporary increase in noise will result from the construction equipment used to clear portions of the transmission line ROW and install equipment. Standard construction techniques will be used and procedures will comply with applicable OSHA standards. Therefore, noise will likely be minimal. Project construction will likely last for approximately 13 months, ending in November 2024, followed by restoration which is anticipated to finish by May 2025.

(c) Driving of Piles, Rock Breaking or Hammering, and Horizontal Directional Drilling

Driving of piles is not anticipated during construction of the Project. If required, there will be a temporary increase in noise during construction only.

(d) Erection of Structures

Structures will be installed by vehicle-mounted cranes or equivalent equipment. Self-supporting steel poles will require delivery of concrete for foundation construction, where needed, including excavation work for the foundation. Any increase in noise will be temporary and likely minimal.

(e) Truck Traffic

Truck traffic will increase during construction for access and equipment delivery. No other additional traffic is anticipated for the Project beyond periodic mowing or removal of danger trees from the ROW.

(f) Installation of Equipment

The equipment will be installed using standard practices and equipment. Any noise increase will be minor and temporary.

(B) LAND USE

(1) Map of Land Use

An applicant for a Certificate of Environmental Compatibility of Public Need for electric transmission facilities is required to evaluate both the Preferred Route and Alternate Route for the transmission line within the application. Maps at 1:12,000-scale, including the area 1,000 feet on either side of the centerline (also referred to as the 2,000-foot corridor), are presented in Figures 7-1A through 7-1J (refer to Section 4906-5-05) and include the following information:

- Centerline and ROW for the Preferred and Alternate Routes;
- AEP facilities including existing stations and interconnect locations; and,
- Land use types, road names, residences, cemeteries, waterbodies, and agricultural districts.

(2) Impact of Facility on Each Land use

A land use comparison of the Preferred and Alternate Route ROWs is shown in **Figure 7-1** and below in **Table 7-3**. Estimates (i.e., linear feet, acreage, and percentages) of each land use crossed

by the transmission centerline line within the 60-foot-wide ROW were generated using geographic information systems (GIS). The estimates of each land use type being crossed by the 60-foot-wide transmission line ROW were determined based on Franklin County parcel data.

The potential disturbance area during construction (vegetation clearing, pole installation, etc.) consists of the 60-foot-wide ROW. The 60-foot-wide permanent ROW will be restored through soil grading, seeding, and mulching, thus any permanent impact to the ROW is limited to removal of tall growing trees and other vegetation. Property owners may continue to use the ROW area for general uses that will not affect the safe and reliable operation of the transmission line, such as lawn maintenance, crop cultivation, and livestock grazing. Approximately three miles of the existing Shannon-Astor 138 kV Transmission Line is proposed to be rebuilt as part of the Preferred Route. If the Alternate Route is selected, this section of transmission line would still be required to be rebuilt as part of the overall Southeast Columbus Area Improvements Project.

Table 7-3. Acreage and Percent of Land Uses crossed by the Proposed 60-foot Right of Way

Land Use	Preferred Route		Alternate Route	
	Acreage	Percent (%)	Acreage	Percent
Agricultural	4.9	10.1%	5.2	13.9%
Commercial	3.2	6.5%	0.6	1.6%
County Road/Highway	4.7	9.6%	8.3	22.1%
Forested	2.9	6.0%	5.1	13.5%
Hospital/Office/School	1.6	3.3%	0	0%
Industrial/Facility	6.5	13.4%	2.3	6.3%
Landscaped/Maintained	5.2	10.8%	4.1	10.9%
Old Field	4.0	8.2%	1.3	3.3%
Open Space/Recreational	1.1	2.4%	0.3	0.7%
Place of Worship	1.7	3.5%	0.7	1.7%
Residential (includes planned)	6.9	14.2%	5.1	13.6%
Railroad	3.8	7.9%	0	0%
Scrub-Shrub	1.8	3.8%	4.3	11.4%
Surface Water	0.1	0.2%	0.3	0.8%
Vacant	0	0%	0	0%
Total:	**48.3**	**100%**	**37.5**	**100%**

(a) Residential

Preferred Route: The Preferred Route is located within 1,000 feet of 1,544 residences, none of which are within the proposed ROW. Most residences within 1,000 feet of the Preferred Route are presently located within 250 feet of the existing Astor – Shannon 138 kV Transmission Line or located adjacent to an active railroad. Therefore, only minimal adverse impacts to residential land uses are anticipated as no residential land use will be impeded by the Project. As shown in **Table 7-3**, 14.2% of the proposed ROW is classified as residential land use (6.9 acres). Most of this consists of proposed residential communities southwest of Brice Road and Refugee Road and southwest of the Interstate-70 (I-70)/I-270 interchange.

Alternate Route: The Alternate Route is located within 1,000 feet of 1,153 residences, none of which are within the ROW. Most of these are located along Winchester Pike. Impacts to residents are limited to aesthetic effects adjacent to roads and landscape trimming or clearing if trees are present. As shown in **Table 7-3**, 13.6% of the Alternate Route ROW is classified as residential (5.1 acres).

(b) Commercial and Industrial

Preferred Route: The Preferred Route is located within 1,000 feet of 130 commercial/industrial buildings, none of which are within the proposed ROW. As shown in **Table 7-3**, 6.5% and 13.4% of the Preferred Route ROW are classified as commercial and industrial lands (3.2 acres and 6.5 acres, respectively).

Alternate Route: The Alternate Route is located within 1,000 feet of 60 commercial buildings, none of which are within the ROW. As shown in **Table 7-3**, 1.6% and 6.3% of the Alternate Route ROW is classified as commercial and industrial lands (0.6 acre and 2.3 acres, respectively).

(c) Schools and Hospitals

Preferred Route: The Preferred Route is located within 1,000 feet of three schools, none of which are within the proposed ROW. As shown in **Table 7-3**, no school property is located within the Preferred Route ROW. No hospitals are located within the proposed ROW or within 1,000 feet of the Preferred Route.

Alternate Route: No schools or hospitals are located within the ROW or within 1,000 feet of the Alternate Route.

(d) Places of Worship

Preferred Route: The Preferred Route is located within 1,000 feet of five places of worship. As shown in **Table 7-3**, 3.5% of the Preferred Route ROW is classified as places of worship (1.7 acres). The proposed ROW impacts one place of worship property, however, the church building is not located within the proposed ROW.

Alternate Route: The Alternate Route is located within 1,000 feet of three places of worship, none of which are within the ROW. As shown in **Table 7-3**, 1.7 percent of the Alternate Route ROW is classified as places of worship (0.7 acre).

(e) Recreational

Preferred Route: The Preferred Route is located within 1,000 feet of five parks, including: Chatterton Parkland, Shelbourne Parkland, Sol Shenk Parkland, Walnut View Parkland, and Chatterton Brice Parkland. Sol Shenk Parkland and Walnut View Park are located within 95 feet and 80 feet, respectively, of the Preferred Route opposite the railroad tracks. Chatterton Brice Parkland is crossed by the centerline within the existing Shannon – Astor 138 kV Transmission Line ROW. Chatterton Parkland is crossed by the Preferred Route within existing maintained ROW. The Preferred Route does not require any new tree clearing within Chatterton Park. As shown in **Table 7-3**, 2.4% of the Preferred Route ROW is classified as recreational land (1.1 acres). No other parks are located within the proposed ROW.

Alternate Route: The Alternate Route is located within 1,000 feet of six parks, including: Helsel Park, M-Five Parkland, Big Walnut-Edgewater Parkland, Mason Run Parkland of Clean Ohio ("COH"), Winchester Bend Parkland, and Elk Run/Winchester Pike Parkland. Big Walnut-Edgewater Parkland COH and Mason Run Parkland COH are located within approximately 100 feet of the Alternate Route opposite the Bixby – Groves Road 138 kV Transmission Line. At their closest distance, Elk Run/Winchester Pike Parkland is located within 50 feet of the Alternate Route. None of these parks are located within the ROW. Approximately 0.03 acres of the Shannon Road park easement is crossed by the Alternate Route ROW, adjacent north of Shannon Road (CR

118). No tree clearing or other impacts are required. As shown in **Table 7-3**, 0.7% of the Alternate Route ROW is classified as recreational land (0.3 acre).

(f) Agricultural

Agricultural land including both cultivated crops and pasture are scattered throughout the ROW of the Preferred Route and Alternate Route. The Preferred Route ROW traverses approximately 4.9 acres of agricultural land, while the Alternate Route crosses 5.2 acres of agricultural land. Permanent impacts to agricultural lands would be limited to the structure footprints as agricultural activity can continue within the transmission ROW, as further discussed in Section C – Agricultural Districts and Land.

(g) Vacant

Vacant land is not located within the ROW of the Alternate Route or the Preferred Route ROW, including undeveloped properties zoned for residential, commercial, and industrial. No adverse impacts to vacant land uses are anticipated as a result of the Project.

(3) Impact on Identified Nearby Structures

(a) Structures within 200 feet of Proposed Right of Way

There are two unoccupied outbuildings and one walk-up restaurant within the Preferred Route proposed 60-foot ROW. The Company plans to remove one unoccupied outbuilding and design around the other unoccupied railroad maintenance outbuilding and walk-up restaurant. Within 200 feet of the Preferred Route ROW, there are 46 commercial/industrial structures, one communication tower, 28 multi-family residential dwellings, 95 unoccupied outbuildings, four places of worship, 229 single-family residential dwellings, and one school. Of these structures, 15 commercial/industrial buildings, the communication tower, 14 multi-family residential dwellings, 20 unoccupied outbuildings, all four places of worship, and 100 single-family residential dwellings are also within 200 feet of the existing Shannon – Astor 138 kV Transmission Line planned for rebuild.

There are no structures within the Alternate Route proposed 60-foot ROW. Within 200 feet of the Alternate Route ROW, there are 14 commercial/industrial structures, one cemetery, one

communication tower, 39 multi-family residential dwellings, 64 unoccupied outbuildings, two places of worship, and 119 single-family residential dwellings.

Commercial/industrial structures, places of worship, and schools within 200 feet of the proposed ROWs are included below in **Table 7-4**, with their measured distances. No impacts are anticipated for any of the structures listed.

Table 7-4. Structures within 200 feet of Proposed 60-foot Right of Way			
Preferred Route		**Alternate Route**	
Structure Type	Distance from ROW (ft)	Structure Type	Distance from ROW (ft)
Outbuilding	0 (within ROW)*		
Outbuilding	0 (within ROW)*		
Commercial/Industrial			
Walk-Up Restaurant	0 (within ROW)*	Residential Leasing Office	28
Retail - Pallet Supplier	2	Loan Services	35
Retail - Strip Mall	5	Dental Office	64
Retail - Home & Furniture	20	Residential Leasing Office	129
Rental Office	29	City of Columbus Fleet Licensing	136
Retail - Electronics	35	Gas Station	183
Retail - Convenience	42	--	--
Cleaning Services	46	--	--
Vacant Commercial	50	--	--
Storage Unit	55	--	--
Mixed-Use Retail/Office	59	--	--
City of Columbus Fleet Management	64	--	--
Trucking Logistics - Warehouse	65	--	--
Retail - Salon	72	--	--
Trucking Logistics - Office	89	--	--
Retail - HVAC	90	--	--
Manufacturer - Heating	94	--	--
Beverage Supplier	98	--	--
Towing Services	100	--	--
Hotel & Lodging	102	--	--
Retail - Home Improvement	119	--	--
Multi-Tenant Office	133	--	--
Automotive Services	135	--	--
Brice Mayor's Office	173	--	--

Table 7-4. Structures within 200 feet of Proposed 60-foot Right of Way			
Preferred Route		**Alternate Route**	
Structure Type	Distance from ROW (ft)	Structure Type	Distance from ROW (ft)
Dine-In Restaurant	183	--	--
Crane Services	183	--	--
Self-Storage	213	--	--
Places of Worship			
Baptist Church	2	--	--
Methodist Church	14	Methodist Church	88
Baptist Church	45	Baptist Church	109
Buddhist Temple	177	--	--
Cemetery			
Methodist Church Cemetery	--	Methodist Church Cemetery	40
Institutional (School)			
Performance Academy	59	--	--

*Do not anticipate direct impact or removal due to engineered solutions

(b) Destroyed, Acquired, or Removed Buildings

A residential shed and a walk-up restaurant are located within the proposed ROW for the Preferred Route, which are both located within the existing Shannon – Astor 138 kV transmission line ROW. In addition, there is a railroad maintenance shed within the Preferred Route's greenfield ROW. No structures are located within the proposed ROW for the Alternate Route. No residences are present within the ROW for either the Preferred or Alternate Routes.

The potential removal of structures within the ROW was mitigated during the siting of the Preferred Route and Alternate Route by designing route options that avoid structure impacts to the extent feasible. Based on negotiations with landowners, the residential shed within the proposed ROW would be removed for the Preferred Route. The Preferred Route is to be designed around the walk-up restaurant and second outbuilding, which is a maintenance shed located within the Norfolk Southern railroad corridor.

(c) Mitigation Procedures

Mitigation for the prohibition of the future installation of structures within the ROW and vegetative clearing and maintenance activities for the transmission line will be determined as part of the Company's acquisition of the ROW for this Project, as part of the negotiated settlement between

the Company and the property owner, or as determined in appropriation proceedings. If an existing septic system located in the transmission ROW is impacted by construction, operation, or maintenance of the proposed Project, the septic system will be repaired or replaced by the Company as necessary to meet the appropriate installation requirements.

(C) AGRICULTURAL DISTRICTS AND IMPACTS TO AGRICULTURAL LAND

Approximately 4.9 acres of agricultural land is in the Preferred Route ROW, while 5.2 acres is located within the Alternate Route ROW.

(1) Agricultural Land Use/Districts Map

The various categories of agricultural land use are depicted on **Figures 7-1A to 7-AJ** for both the Preferred Route and Alternate Route.

(2) Impacts to Agricultural Lands and Agricultural Districts

The Franklin County Auditor was contacted to obtain information on current Agricultural District Land records. Current data was received on January 7. Neither the Preferred Route nor Alternate Route cross a designated Agricultural District.

The potential impacts of the Project on agricultural land include damage to crops that may be present, disturbance of underground field drainage systems, compaction of soils and potential for temporary reduction of crop productivity.

Soil compaction resulting from construction is typically a temporary issue and is resolved within a few seasons of plowing and tilling. The Company will work with the agricultural landowners to resolve conflicts with drainage tiles and irrigation systems that are affected by the Project where necessary.

(a) Acreage Impacted

Table 7-2 provides the acreage of agricultural land within the ROW. Agricultural land use was based on current parcel data obtained from Franklin County and field observations. Permanent impacts to agricultural lands would be limited to the structure footprints, while temporary impacts would be limited to access roads during construction and maintenance of the routes. No further

impacts to agricultural land uses, or associated structures, are anticipated from the operation of the route as agricultural activities can continue within the transmission ROW.

(b) Evaluation of Construction, Operation, and Maintenance Impacts

The following subsections include an evaluation of the impact of the construction, operation, and maintenance of the proposed transmission line on the land and the following agricultural facilities and practices within the Project area, where present.

(i) Field Operations

During construction, field operations such as plowing, planting, cultivating, spraying, and harvesting of cultivated crops will only be interrupted for a portion of the growing season or a portion of the dormant season for agricultural operations. Property owners will be compensated for crop damage resulting from the Company's construction activities. No significant impacts to livestock operations or grazing areas are anticipated. Property owners may continue to use the ROW area for general uses (e.g., lawn maintenance, crop cultivation, livestock) after construction but is contingent upon the use having no adverse impact on the safe and reliable operation of the transmission line.

(ii) Irrigation

There are no known irrigation systems within the proposed ROW for either route. The Company will identify the presence of any such systems through contact with landowners once the final route is approved. Any system that must be relocated will be coordinated with the landowner to avoid affecting the irrigation system's operation and avoid any cost incurred by the landowner.

(iii) Field Drainage Systems

Damage to field tile systems is unlikely given the installation of mostly direct-embed steel pole structures, but the Company will restore damaged systems to their pre-construction condition. The company will also work with the agricultural landowners to resolve conflicts with field drainage systems and other facilities that are crossed by the Project where necessary.

(iv) Structures Used for Agricultural Operations

There are no structures used for agricultural operations within 200 feet of the Preferred Route and Alternate Route that may be adversely affected by the construction and operation of the transmission line.

(v) Agricultural Land Viability for Agricultural Districts

Agricultural Districts are not crossed by either the Preferred Route or Alternate Route.

(c) Mitigation Procedures

Mitigation for damage to existing crops and the compaction of soils is provided as compensation to the property owner as specified in the easement for the ROW. The specific terms of the easement regarding crop damage or soil compaction are determined as part of the Company's acquisition of the ROW for the Project, as part of the negotiated settlement between the Company and the property owner, or as determined in appropriation proceedings. Additionally, the Company and the contractors hired to work on the Project have extensive experience in transmission line construction. Both the Company and the selected contractors will work to minimize agricultural impacts during construction of the Project.

(i) Avoidance or Minimization of Damage

To minimize potential damage to agricultural land, the Company will place poles beyond or at the edges of agricultural fields, to the extent practical, and will primarily install single tangent poles to support the transmission line. This mitigation effort should limit disruption of plow patterns and minimize the creation of areas where weeds and other non-crops can grow in relation to construction of the transmission line. In instances where there is damage in the ROW, compensation for this limited impact will be provided to the property owner.

(ii) Field Tile System Damage Repairs

Impacts and resulting repairs to irrigation or field tile drainage systems are not anticipated, but if identified, will be addressed on a case-by-case basis with the individual property owner. In general, the Company will provide mitigation for damage to underground drainage systems from

construction, operation, and maintenance activities by repairing or replacing damaged sections of the drainage systems as necessary.

(iii) Segregation and Restoration of Topsoil

Excavated topsoil will be segregated and stockpiled where necessary to maintain long-term agricultural uses. Topsoil will also be de-compacted and restored to original conditions, unless otherwise agreed to by the landowner.

(D) REGIONAL LAND USE PLANS AND DEVELOPMENT

This section of the application provides information regarding land use plans and regional development.

(1) Impacts to Regional Development

The proposed Project is expected to support regional development in Franklin County through increased reliability and availability of electric power to residential, commercial, institutional, and industrial users throughout the region. No negative impacts on regional development are foreseen for this Project. A more detailed discussion of the need for this Project and how it will affect regional development is included in Section 4906-5-03 of this application.

(2) Compatibility of Proposed Facility with Current Regional Land Use Plans

The Company reviewed the Franklin County community development plans. No conflicts with future proposed land uses outlined in the plans were identified. As such, the Project is compatible with the current regional land use plans and will support their implementation by allowing for further economic development in Project area.

(E) CULTURAL AND ARCHAEOLOGICAL RESOURCES

Cultural resource studies of the Project area were conducted on behalf of the Company. In addition to a background records check and literature review using data files from the State Historic Preservation Office ("SHPO") for both the Preferred Route and Alternate Route, detailed History/Architectural Investigations and a Phase I Archaeological Investigation have been

completed. Copies of the reports detailing these efforts can be filed, as a confidential filing, with the OPSB due to the sensitive nature of the location information for archaeological sites.

(1) Cultural Resources Map

Based on the cultural resources desktop study, there are no scenic rivers or scenic routes/byways as defined by Ohio Department of Natural Resources (ODNR) and/or the Ohio Department of Transportation (ODOT) or registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance within 1,000 feet of the Preferred Route and Alternate Route. Cultural resources already in public domain (churches, cemeteries, and Ohio Historic Inventory (OHI) structures) are identified in **Figure 7-2**.

(2) Cultural Resources in Study Corridor

Archival research considered a 1,000 foot buffer around both the Preferred Route and Alternate Route, to locate previously-identified cultural resources and to provide information on the probability of identifying cultural resources as part of this Project. This review included examination of the Ohio Archaeological Inventory (OAI), (OHI), Determination of Eligibility (DOE) files, the National Register of Historic Places (NRHP), historic cemeteries, historic bridges, National Historic Landmarks (NHLs), and previous cultural resources surveys on-file with the SHPO. This archival research indicated the following for the Preferred Route and Alternate Route. Separate reports summarizing these efforts can be provided to OPSB upon request.

- **Preferred Route:** No NHRP properties/districts or DOE files are within 1,000 feet of the Preferred Route. A total of two OAI sites, 11 OHI resources, one cemetery, and 10 prior cultural investigations have been documented within 1,000 feet of the Preferred Route alignment. No bridges were documented within 1,000 feet of the Preferred Route. No OAI sites, OHI resources, or cemeteries are located within the Preferred Routes ROW. None of the OAI archaeological sites within 1,000 feet of the Preferred Route extend within the Preferred Route ROW. There were no archaeological sites identified during the field reconnaissance work. No historic properties or landmarks will be affected by the Project regarding the archaeological component. No further archaeological or architectural work is recommended.

- **Alternate Route:** A literature review was completed for the Alternate Route. There are no NHRP properties/districts within 1,000 feet of the Alternate Route. There is one DOE resource within 1,000 feet of the Alternate Route; however, it is not within the Project corridor. The Graham House is a DOE resource that is just north of the Alternate Route. There are 33 OAI archaeological sites, five OHI architectural sites, no bridges, and one cemetery located within 1,000 feet of the Alternate Route. None of the recorded archaeological sites are significant regardless of their involvement with the 1,000 feet of the Alternate Route and most were recorded greater than 1,000 feet from the Alternate Route. A total of eight OHI resources, one cemetery, and 15 prior cultural investigations have been documented within 1,000 feet of the Alternate Route alignment. No bridges were documented within 1,000 feet of the Alternate Route. Of this inventory, eight OHI-listed aboveground resources occur within 500 feet of the Alternate Route. No historic properties or landmarks will be affected by the Project regarding the archaeological component. No further archaeological or architectural work is recommended.

Cultural resources already in the public domain (e.g., OHI-listed resources) within 1,000 feet of the Preferred Route and Alternate Route are identified in **Figure 7-2**.

(3) Construction, Operation and Maintenance Impacts on Cultural Resources

Based on the results of the cultural resources investigations to date, impacts to cultural resources associated with the construction, operation, and maintenance of the proposed Project are not anticipated.

(4) Mitigation Procedures

As noted above, based on the results of the desktop review and field surveys, no adverse impacts to known and recorded historic properties are anticipated because of the Project; therefore, no mitigation is proposed at this time.

(5) Aesthetic Impact

(a) Visibility of the Project

The viewsheds along both the Preferred Route and Alternate Route from residences and potentially sensitive vantage points may be altered by the presence of the transmission line. The Project area is characterized by relatively flat terrain, suburban and urban residential properties, industrial lots, agricultural areas, woodlots, wetlands, and floodplains. Many major overhead transmission lines, distribution lines, large industrial and commercial buildings, and railroads extend through or adjacent to the proposed boundaries of the Preferred Route and Alternate Route. Due to both the intervening developed land uses and existing infrastructure crossed, the Project is unlikely to have a significant impact on the overall visual landscape. At select locations, where tree clearing may be required or upgrading structures to double circuit, visual impacts may be greater. There are no scenic byways or rivers crossed by or in the viewshed of the Project.

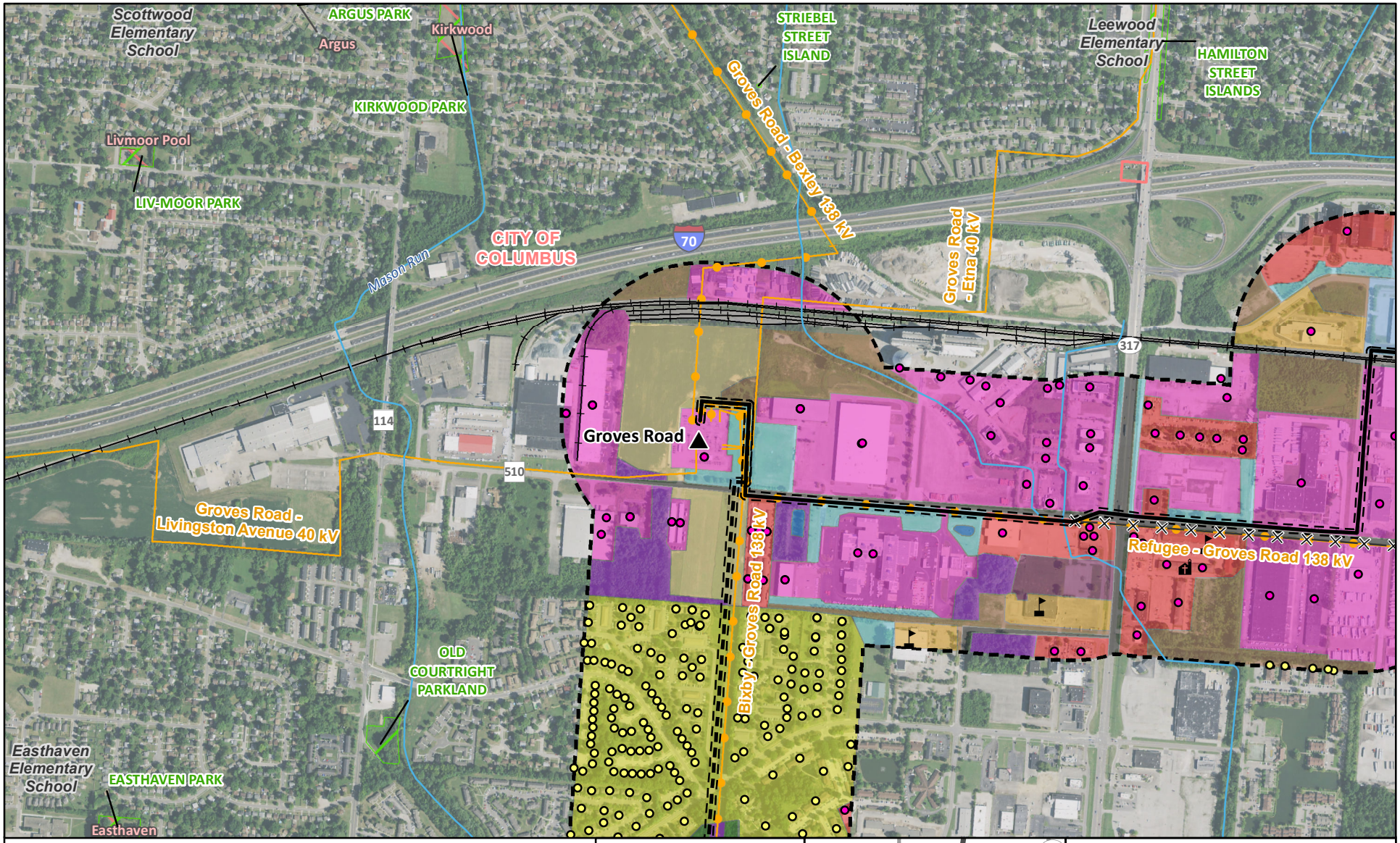
(b) Facility Effect on Site and Surrounding Area

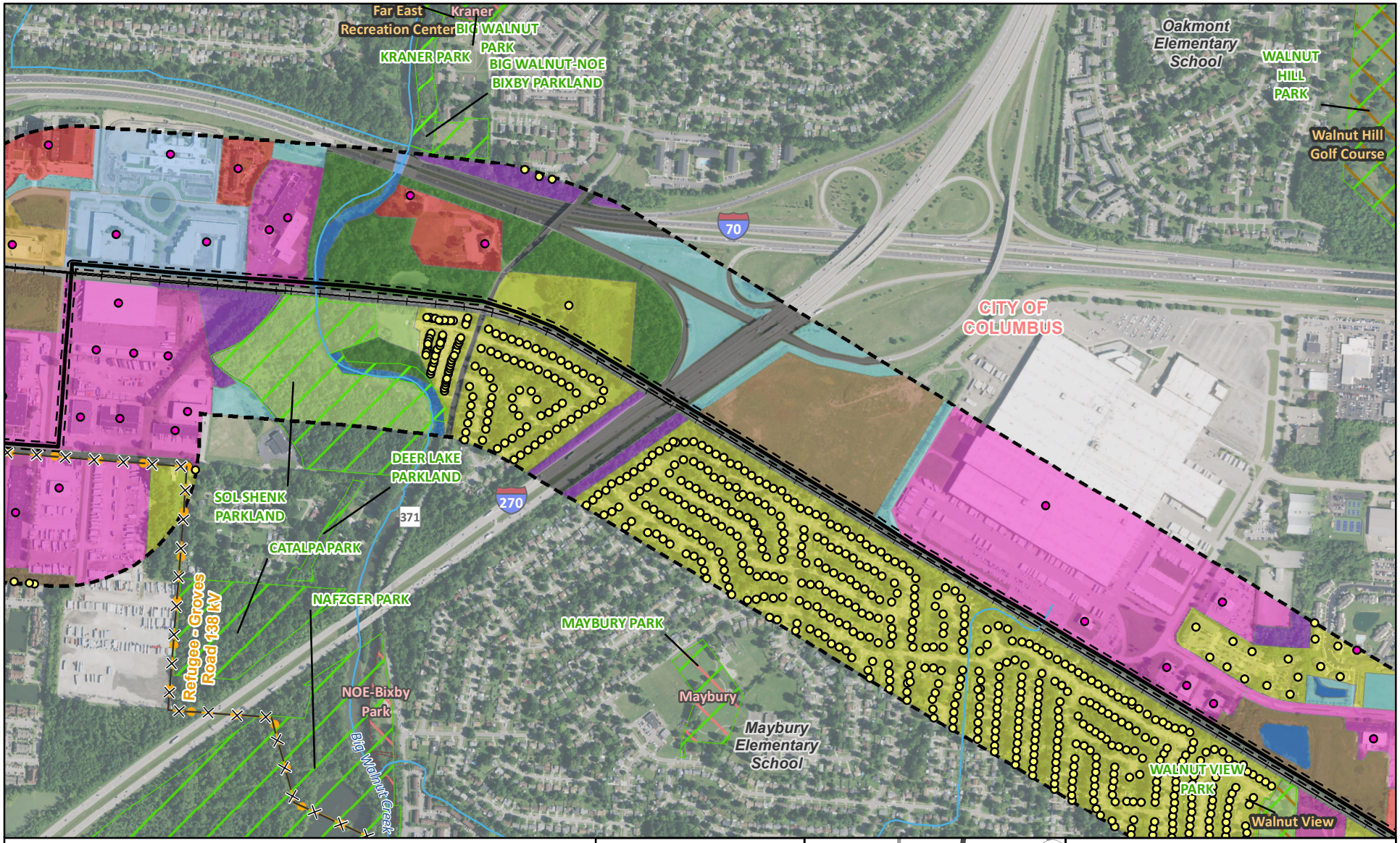
Construction of a Project would affect the existing visual aesthetics of the area through which the transmission line passes, primarily from the removal of trees for any areas within the ROW or upgrading to large structures to accommodate a double circuit configuration. However, the degree of visual impact of the man-made element will vary with the setting and structure type; the impact can be evaluated by comparing the amount of contrast resulting from the construction of the structure and the existing landscape. For example, if the transmission line were screened from view from sensitive receptors, then the aesthetic impact would be minimal, and if the transmission line were placed in an existing open area, it would have a comparatively higher aesthetic impact. The Preferred Route proposes rebuilding approximately 3.0 miles of the Shannon – Astor 138 kV transmission line to double circuit, within maintained ROW and approximately 3.4 miles of greenfield transmission line, which primarily parallels existing transportation ROW or property boundaries apart from a 0.2 mile cross-country portion. The Alternate Route proposes rebuild approximately 0.2 mile of the Groves Road – Refugee 138 kV transmission line within maintained ROW and approximately 0.1 mile of the Shannon – Astor 138 kV transmission line to double circuit, within maintained ROW. The remaining greenfield portions of the Alternate Route either parallel an existing transmission line for approximately 1.9 miles within existing unmaintained ROW or parallel Winchester Pike for 2.9 miles, apart from approximately 0.1 mile of road crossings.

(c) Visual Impact Minimization

The ability to minimize the visual impacts of the proposed transmission line is constrained by engineering requirements, existing land use, and the Project length. The Company has limited the potential aesthetic impacts of the transmission line to the extent possible through the route selection process, and where practical, paralleling existing infrastructure or rebuilding an existing transmission line.

FIGURES


Scottwood Elementary School
ARGUS PARK
Argus
Kirkwood
KIRKWOOD PARK
Livmoor Pool
LIV-MOOR PARK
STRIEBEL STREET ISLAND
Leewood Elementary School
HAMILTON STREET ISLANDS
Groves Road - Bexley 138 kV
Groves Road - Etna 40 kV
CITY OF COLUMBUS
Mason Run
70
317
114
510
Groves Road
Groves Road - Livingston Avenue 40 kV
Bixby - Groves Road 138 kV
Refugee - Groves Road 138 kV
OLD COURTRIGHT PARKLAND
Easthaven Elementary School
EASTHAVEN PARK
Easthaven
Existing Station
Place of Worship
School/ Institution
Residence
Commercial/ Industrial Building
Railroad
Preferred Route
Alternate Route
Existing Transmission to be Retired
Existing Transmission Line
69 kV and below
138 kV
Railroad
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
PADUS
Local Government
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Hospital/ Office
Industrial/ Facility
Institutional (School)
Landscaped/ Maintained
Old Field
Residential (includes planned)
Railroad
Scrub-Shrub
Surface Water
Vacant
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South
NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-1A
Land Use
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV
Transmission Line Project
0
1,000
2,000
Feet



Residence
Commercial/ Industrial Building
Railroad
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV
Railroad
NHD Stream or River
Proposed ROW
1,000 Foot Buffer

City of Columbus Park or Easement Boundary

PADUS
Local Government
Private Land

Land Use
Commercial
County Road or Highway
Forested
Hospital/ Office
Industrial/ Facility
Institutional (School)
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Residential (includes planned)
Railroad
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

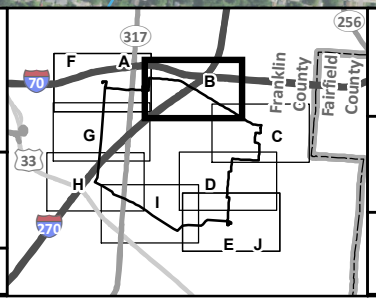
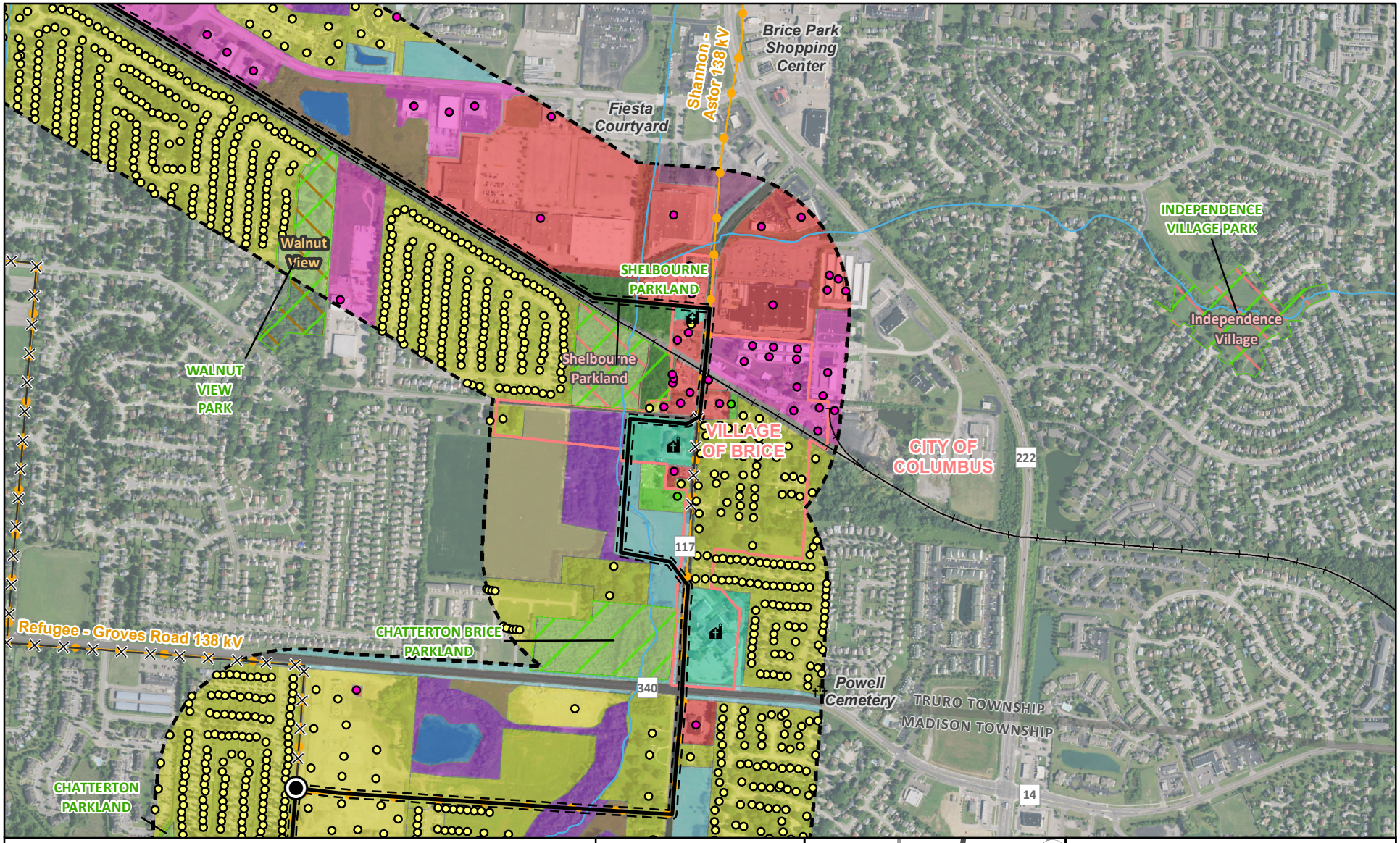


Figure 7-1B
Land Use

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Refugee Switch (to be removed)
Place of Worship
Residence
Civic Building
Commercial/ Industrial Building
Railroad
Preferred Route

Existing Transmission to be Retired

Existing Transmission Line
138 kV
Railroad
NHD Stream or River
Proposed ROW
1,000 Foot Buffer

City of Columbus Park or Easement Boundary

PADUS
Local Government
Private Land

Land Use
Agricultural
Civic
Commercial

County Road or Highway
Forested
Industrial/ Facility
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Place of Worship

Residential (includes planned)
Railroad
Scrub-Shrub
Surface Water
Vacant
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

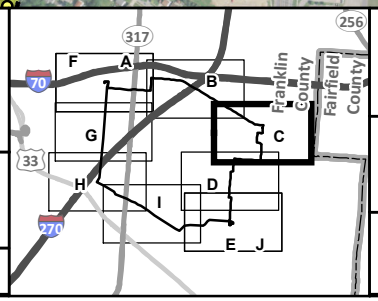
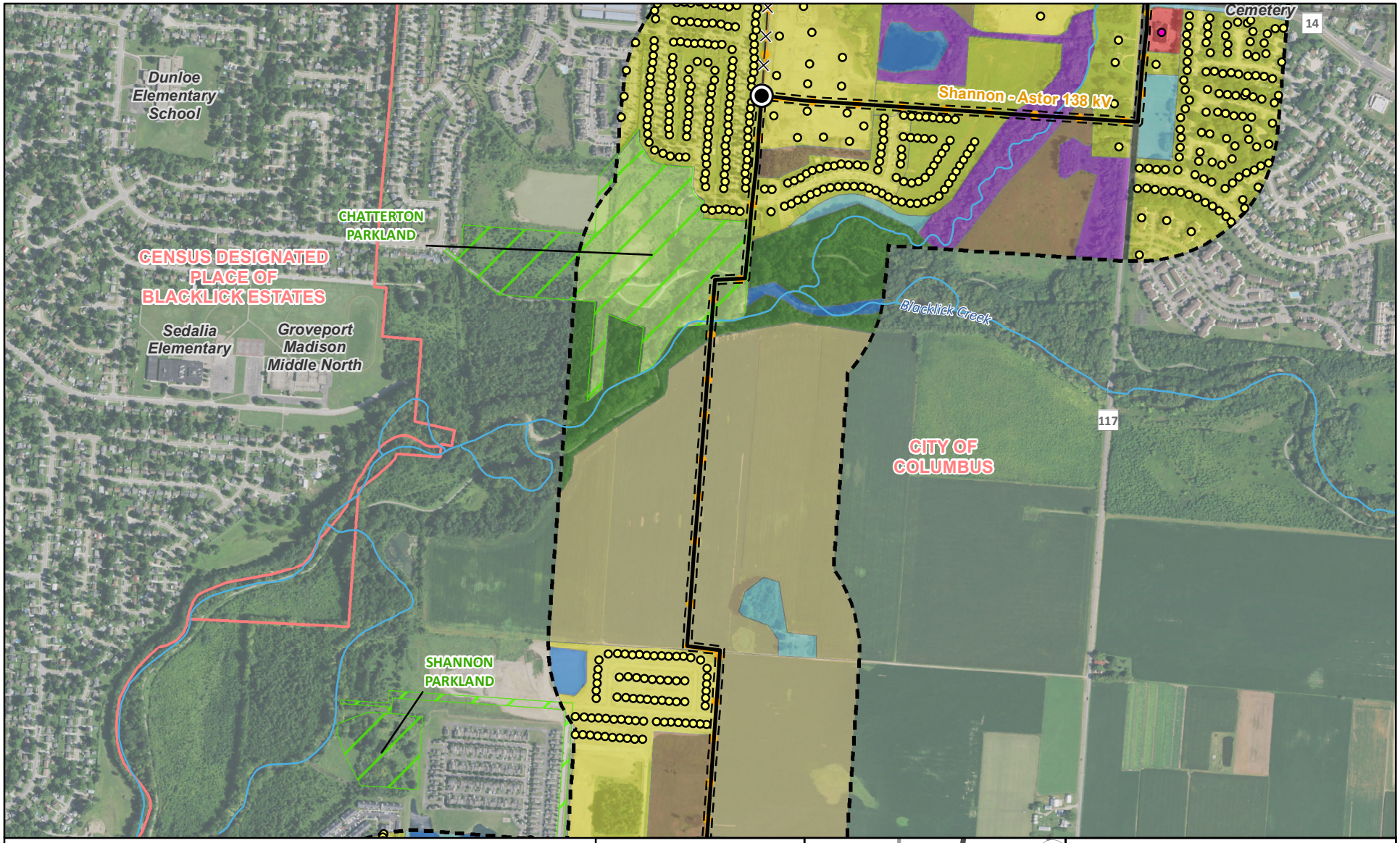


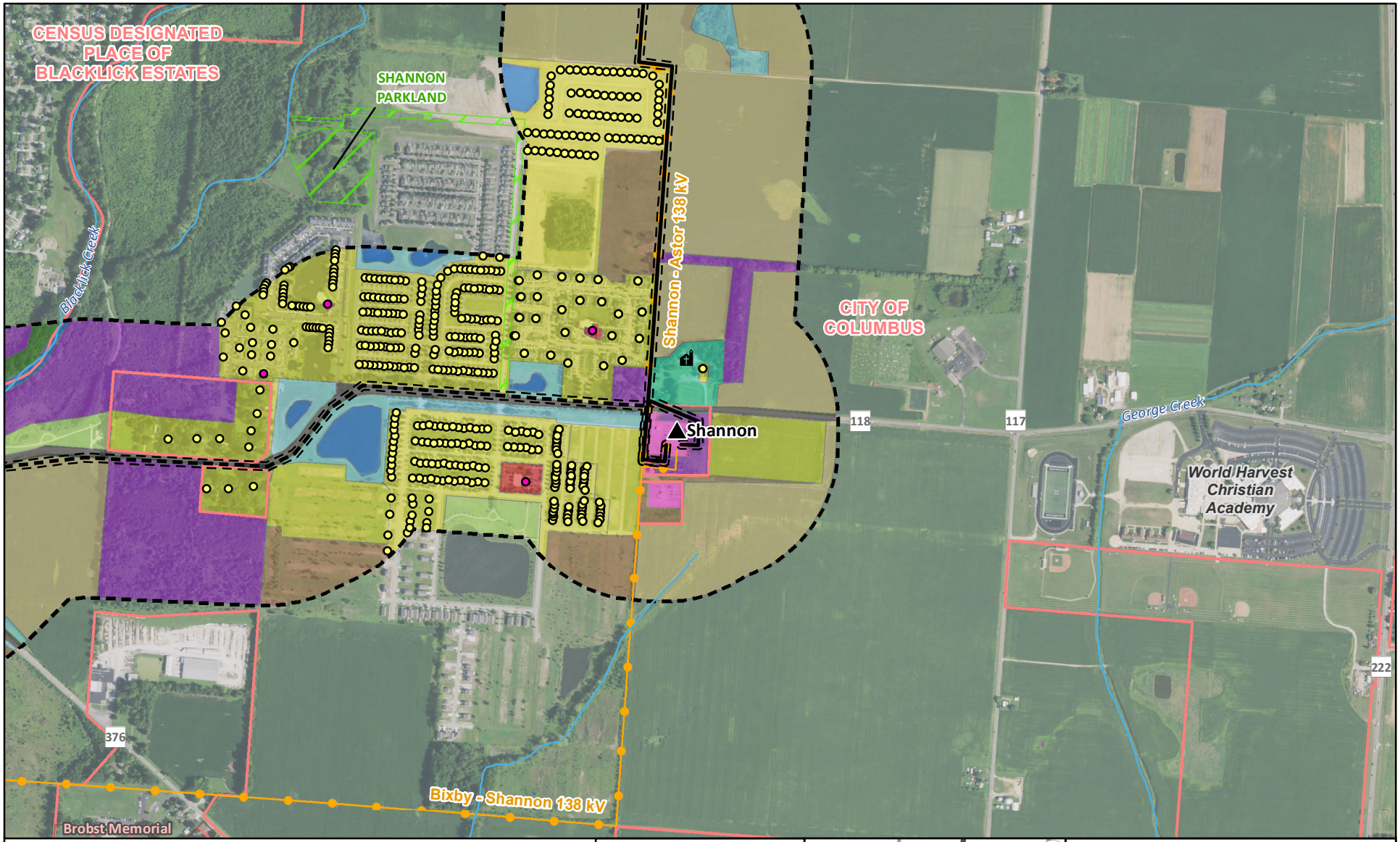
Figure 7-1C
Land Use

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


Dunloe Elementary School
Cemetery
14
Shannon - Astor 138 kV
CHATTERTON PARKLAND
CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
Sedalia Elementary
Groveport Madison Middle North
Blacklick Creek
117
CITY OF COLUMBUS
SHANNON PARKLAND
Refugee Switch (to be removed)
Residence
Commercial/ Industrial Building
Preferred Route
Existing Transmission to be Retired
Existing Transmission Line
138 kV
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-1D
Land Use
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV
Transmission Line Project
0
1,000
2,000
Feet



Existing Station
Place of Worship
Residence
Commercial/ Industrial Building
Preferred Route
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
PADUS
Local Government
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Industrial/ Facility
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Place of Worship
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

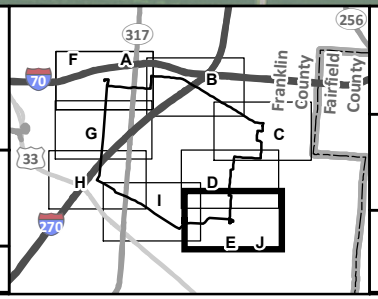
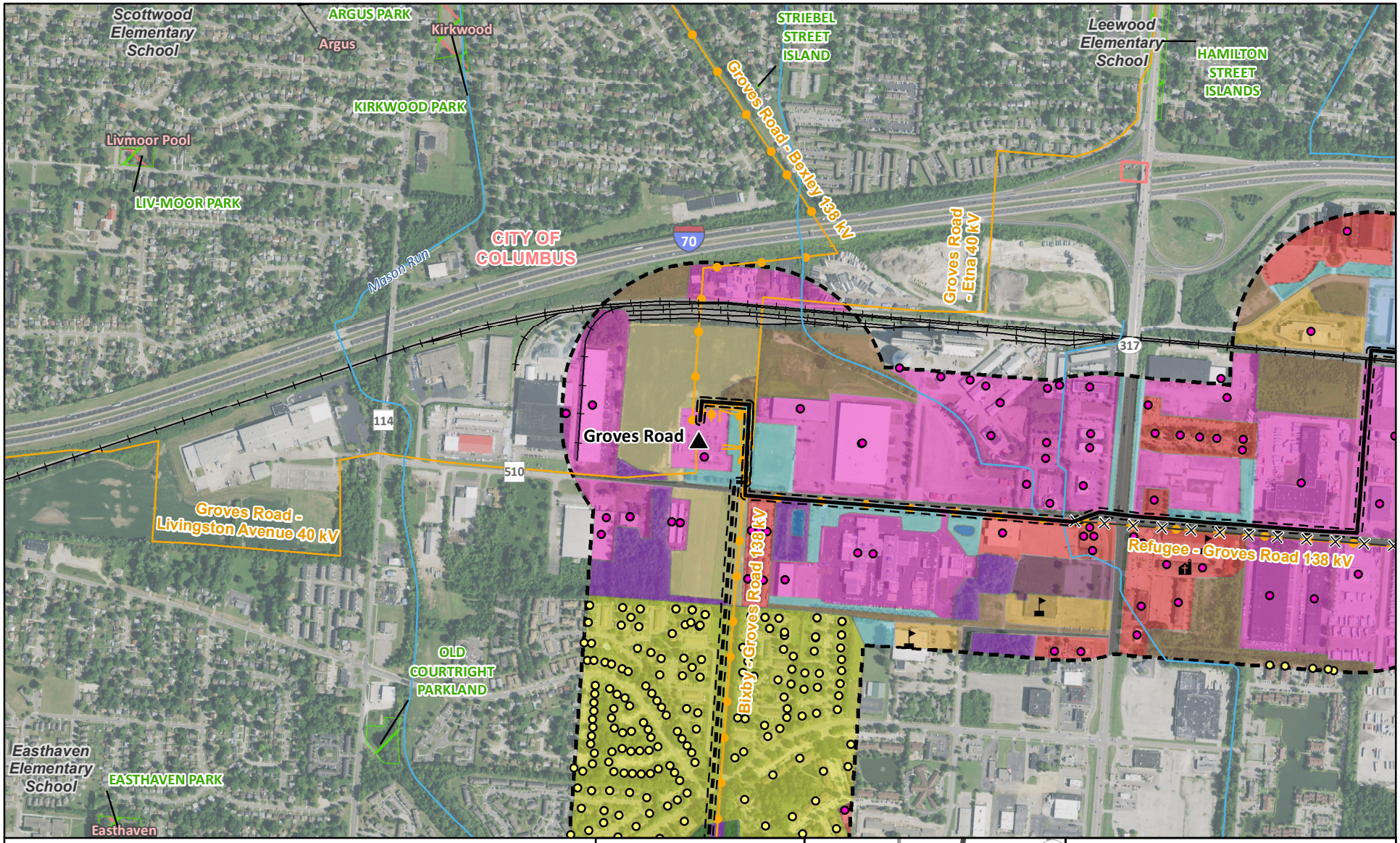


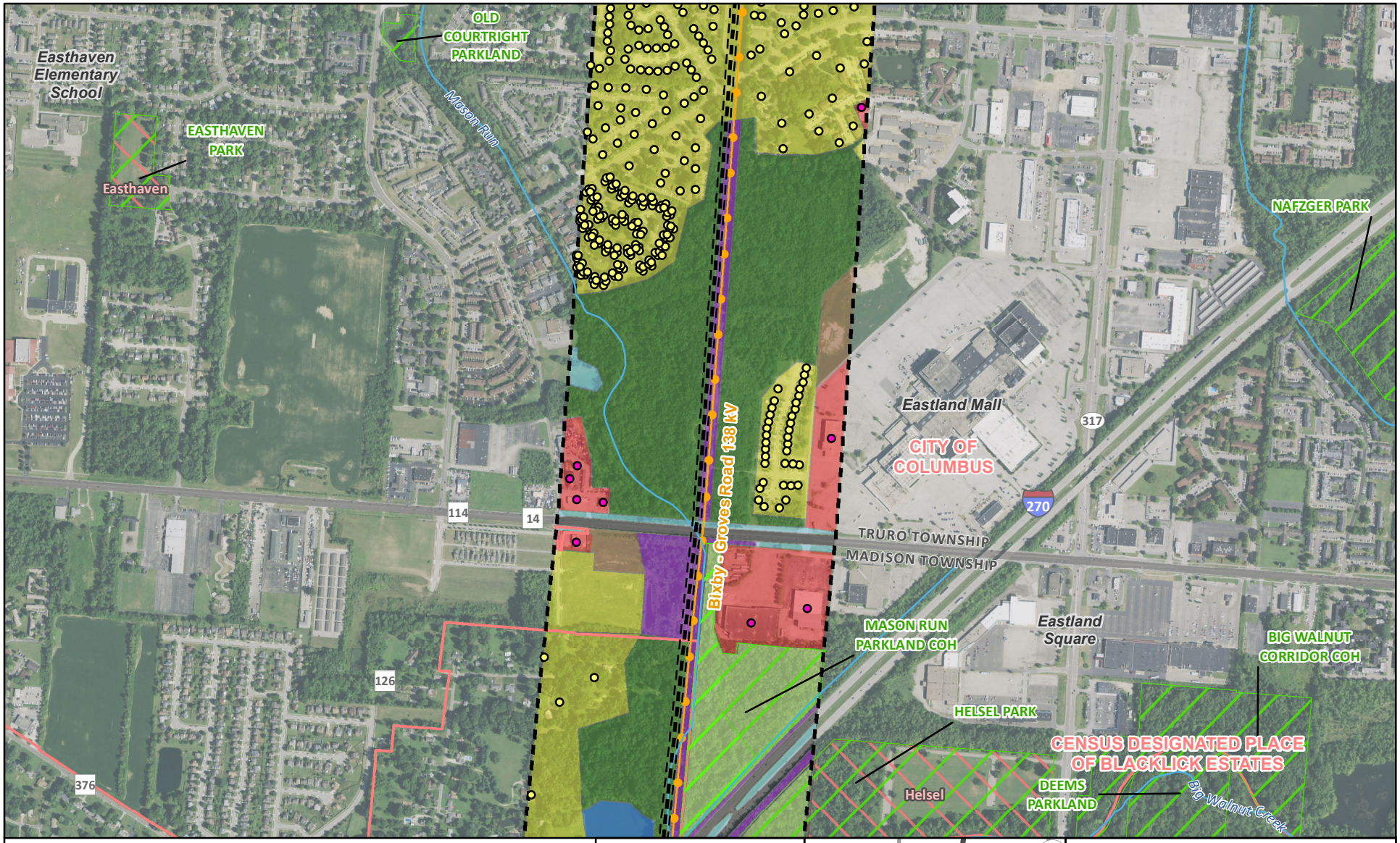
Figure 7-1E
Land Use

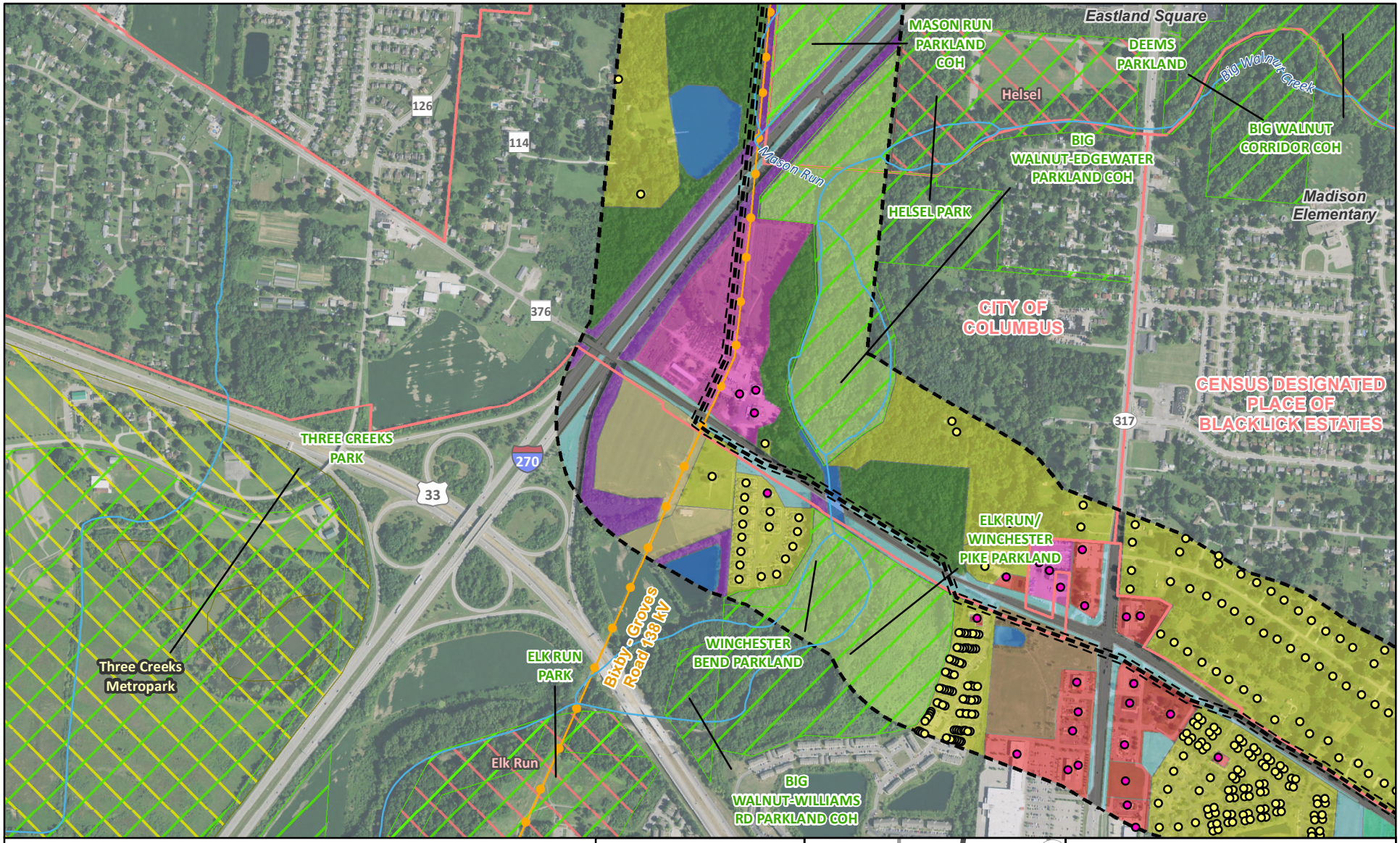
AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


Scottwood Elementary School
ARGUS PARK
Argus
Kirkwood
KIRKWOOD PARK
Livmoor Pool
LIV-MOOR PARK
CITY OF COLUMBUS
Mason Run
STRIEBEL STREET ISLAND
Groves Road - Bexley 138 kV
Groves Road - Etna 40 kV
Leewood Elementary School
HAMILTON STREET ISLANDS
70
317
114
510
Groves Road
Groves Road - Livingston Avenue 40 kV
Bixby - Groves Road 138 kV
Refugee - Groves Road 138 kV
OLD COURTRIGHT PARKLAND
Easthaven Elementary School
EASTHAVEN PARK
Easthaven
Existing Station
Place of Worship
School/ Institution
Residence
Commercial/ Industrial Building
Railroad
Preferred Route
Alternate Route
Existing Transmission to be Retired
Existing Transmission Line
69 kV and below
138 kV
Railroad
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
PADUS
Local Government
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Hospital/ Office
Industrial/ Facility
Institutional (School)
Landscaped/ Maintained
Old Field
Residential (includes planned)
Railroad
Scrub-Shrub
Surface Water
Vacant
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South
NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-1F
Land Use
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV
Transmission Line Project
0
1,000
2,000
Feet


OLD COURTRIGHT PARKLAND
Easthaven Elementary School
EASTHAVEN PARK
Easthaven
Mason Run
NAFZGER PARK
Eastland Mall
CITY OF COLUMBUS
317
270
Bixby - Groves Road 138 kV
TRURO TOWNSHIP
MADISON TOWNSHIP
114
14
126
376
MASON RUN PARKLAND COH
Eastland Square
BIG WALNUT CORRIDOR COH
HELSEL PARK
CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
DEEMS PARKLAND
Helsel
Big Walnut Creek
Residence
Commercial/ Industrial Building
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
PADUS
Local Government
Land Use
Commercial
County Road or Highway
Forested
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-1G
Land Use
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV Transmission Line Project
0
1,000
2,000
Feet



Residence
Commercial/ Industrial Building
Alternate Route

Existing Transmission Line
138 kV
NHD Stream or River

Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary

PADUS
Local Government
Regional Agency Special District

Land Use
Agricultural
Commercial
County Road or Highway
Forested
Industrial/ Facility
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Place of Worship
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South NAD 83

March 03, 2022

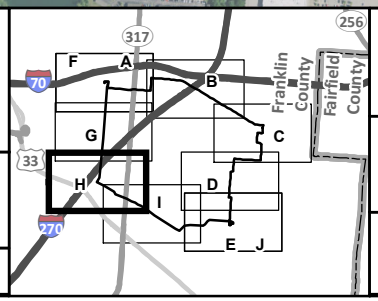
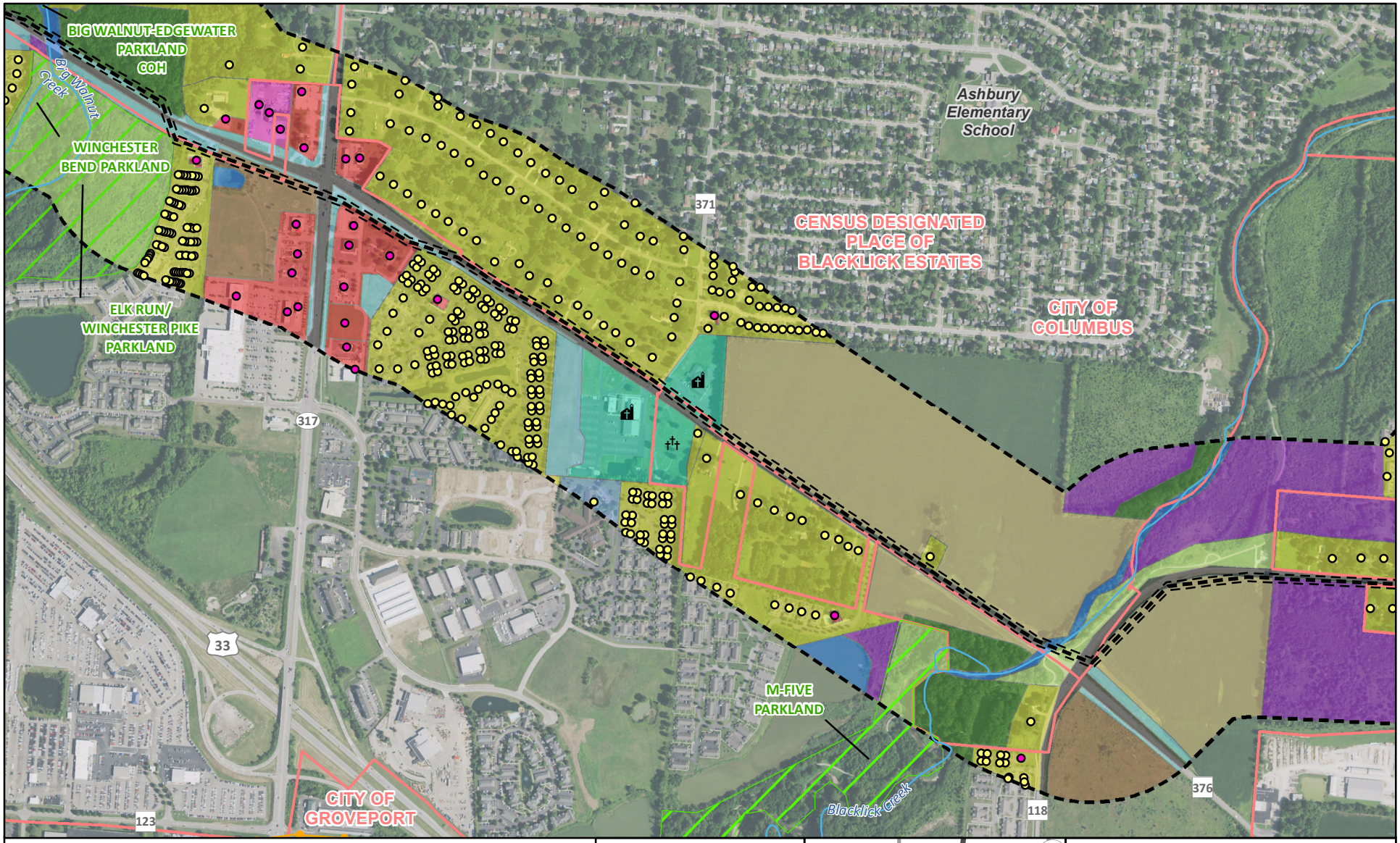


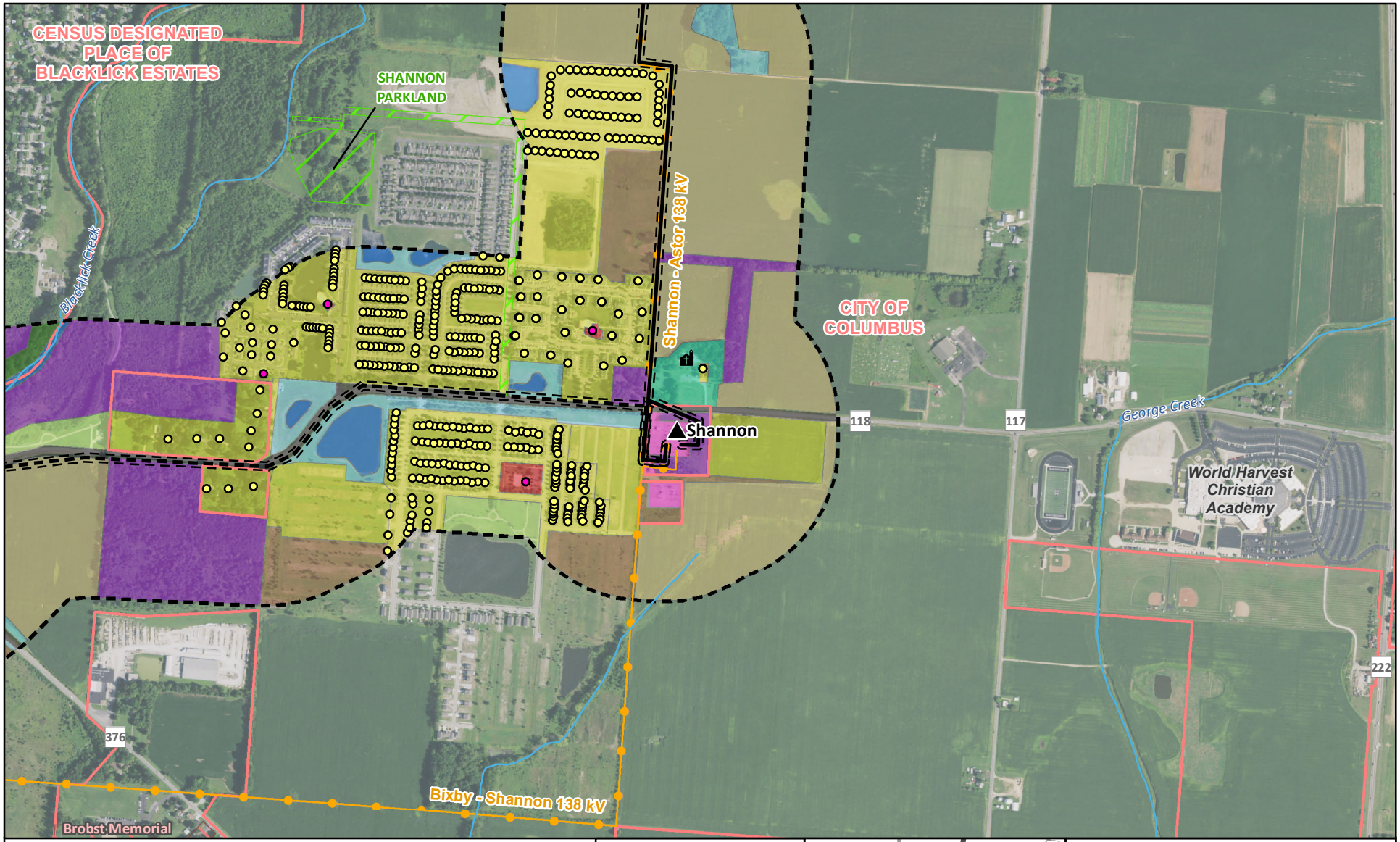
Figure 7-1H
Land Use

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


BIG WALNUT-EDGEWATER PARKLAND COH
Big Walnut Creek
WINCHESTER BEND PARKLAND
ELK RUN/ WINCHESTER PIKE PARKLAND
Ashbury Elementary School
371
CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
CITY OF COLUMBUS
317
33
M-FIVE PARKLAND
CITY OF GROVEPORT
123
Blacklick Creek
118
376
Place of Worship
Residence
Commercial/ Industrial Building
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Hospital/ Office
Industrial/ Facility
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Place of Worship
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)
State Plane Ohio South NAD 83
March 03, 2022
317
256
70
33
270
Franklin County
Fairfield County
A
B
C
D
E
F
G
H
I
J
Figure 7-1l
Land Use
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV Transmission Line Project
0
1,000
2,000
Feet



Existing Station
Place of Worship
Residence
Commercial/ Industrial Building
Preferred Route
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
Proposed ROW
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
PADUS
Local Government
Land Use
Agricultural
Commercial
County Road or Highway
Forested
Industrial/ Facility
Landscaped/ Maintained
Old Field
Open Space/ Recreational
Place of Worship
Residential (includes planned)
Scrub-Shrub
Surface Water
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

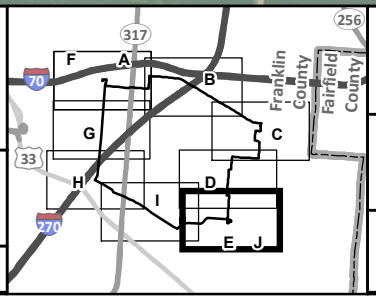
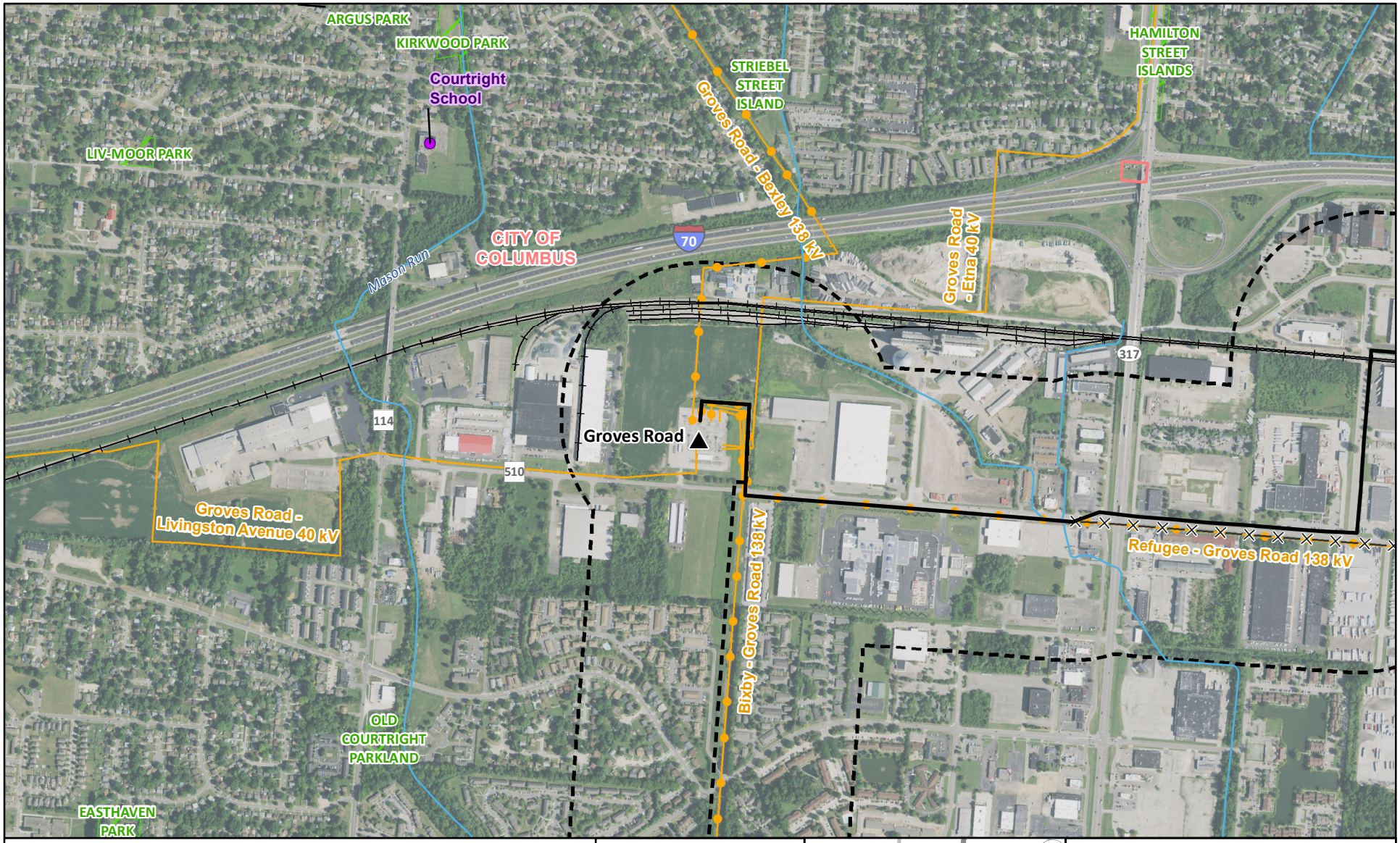


Figure 7-1J
Land Use

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Known Architectural Site
Existing Station
Railroad
Preferred Route
Alternate Route
Existing Transmission to be Retired

Existing Transmission Line
69 kV and below
138 kV
Railroad
NHD Stream or River
1,000 Foot Buffer

City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

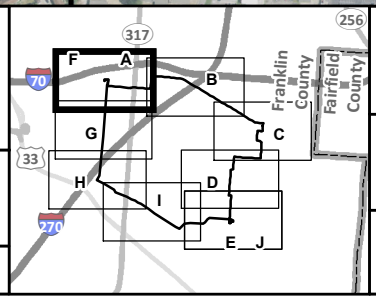
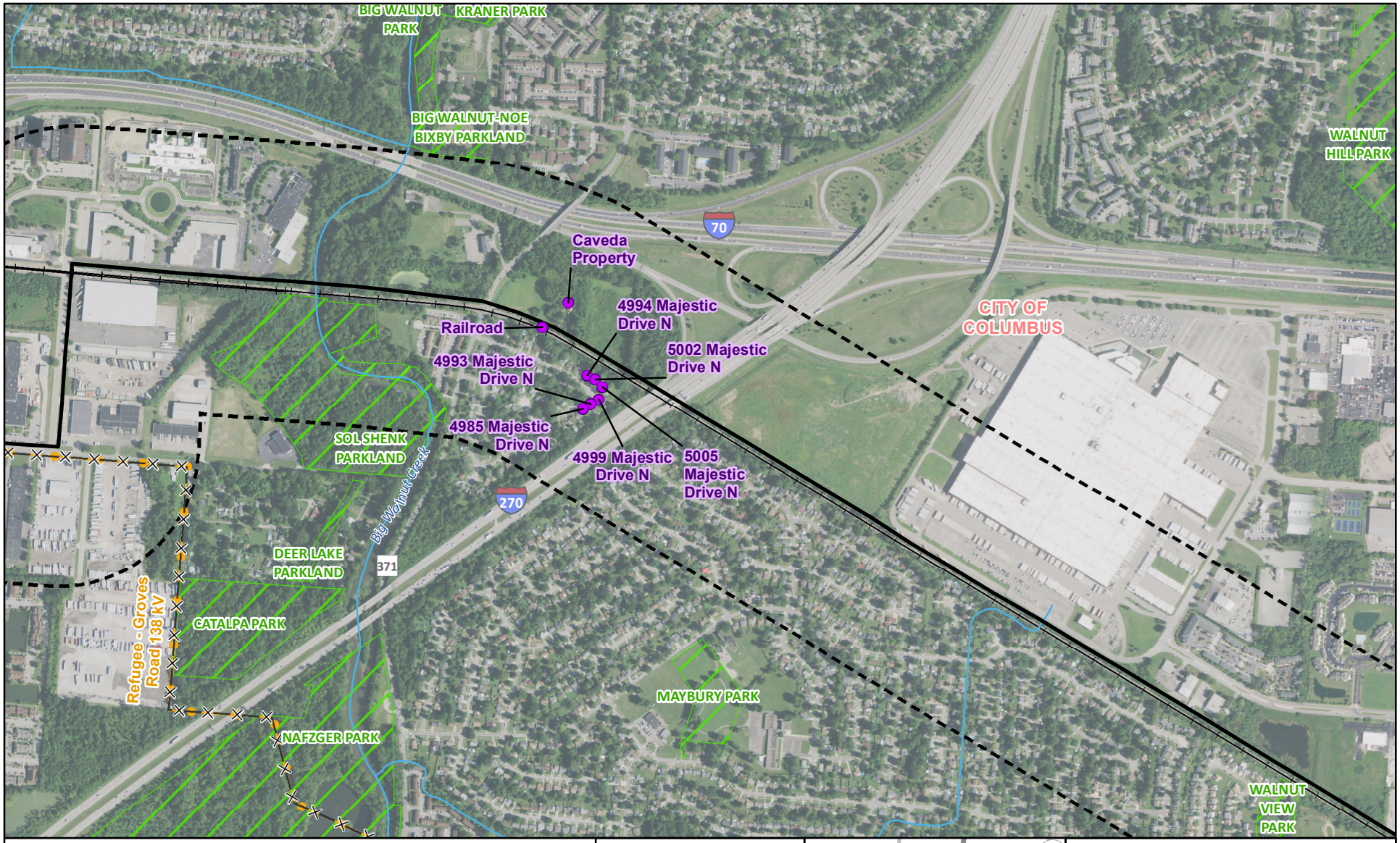


Figure 7-2A
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Known Architectural Site
Railroad
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV

Railroad
NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

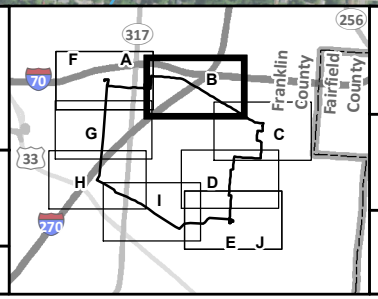
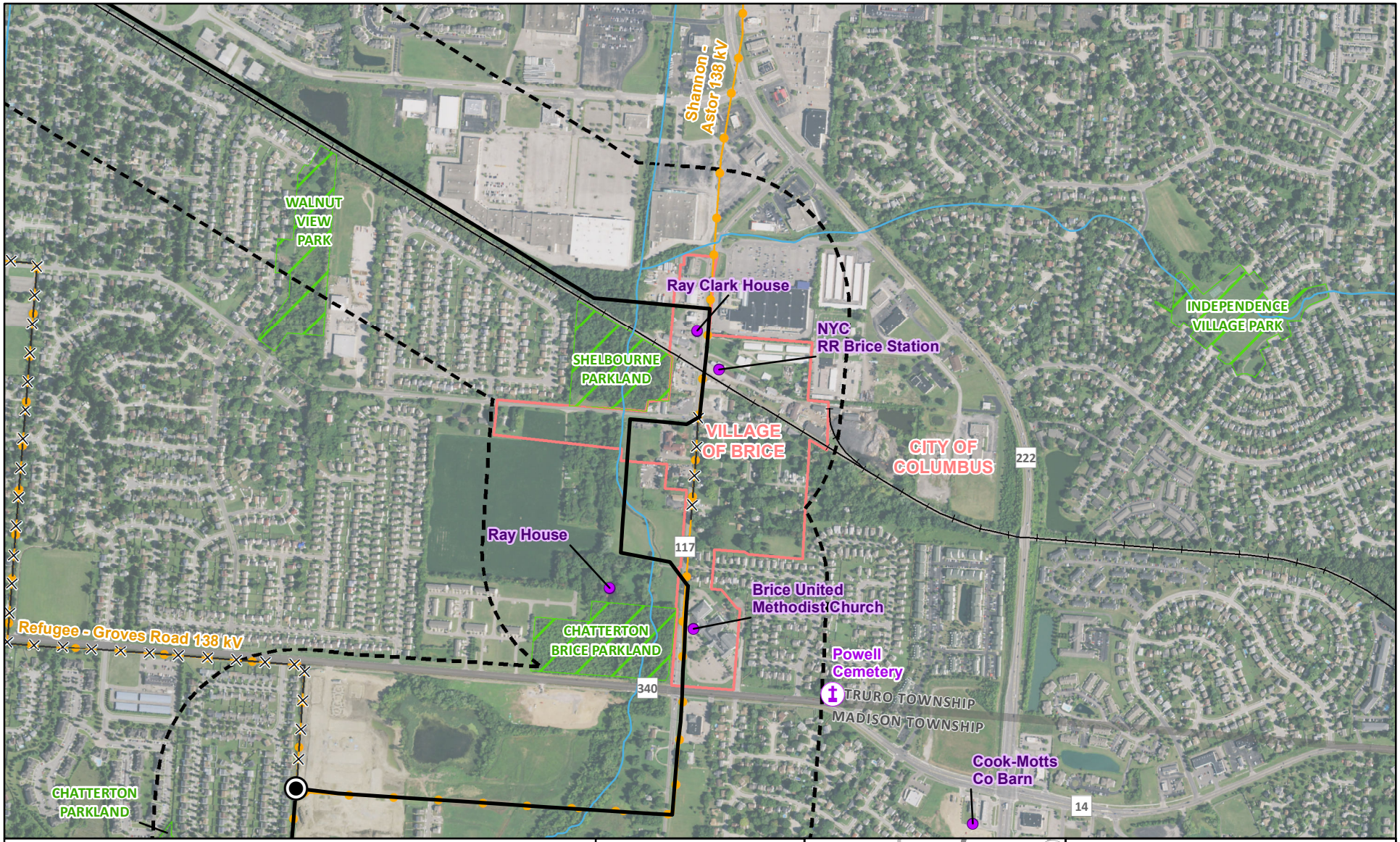


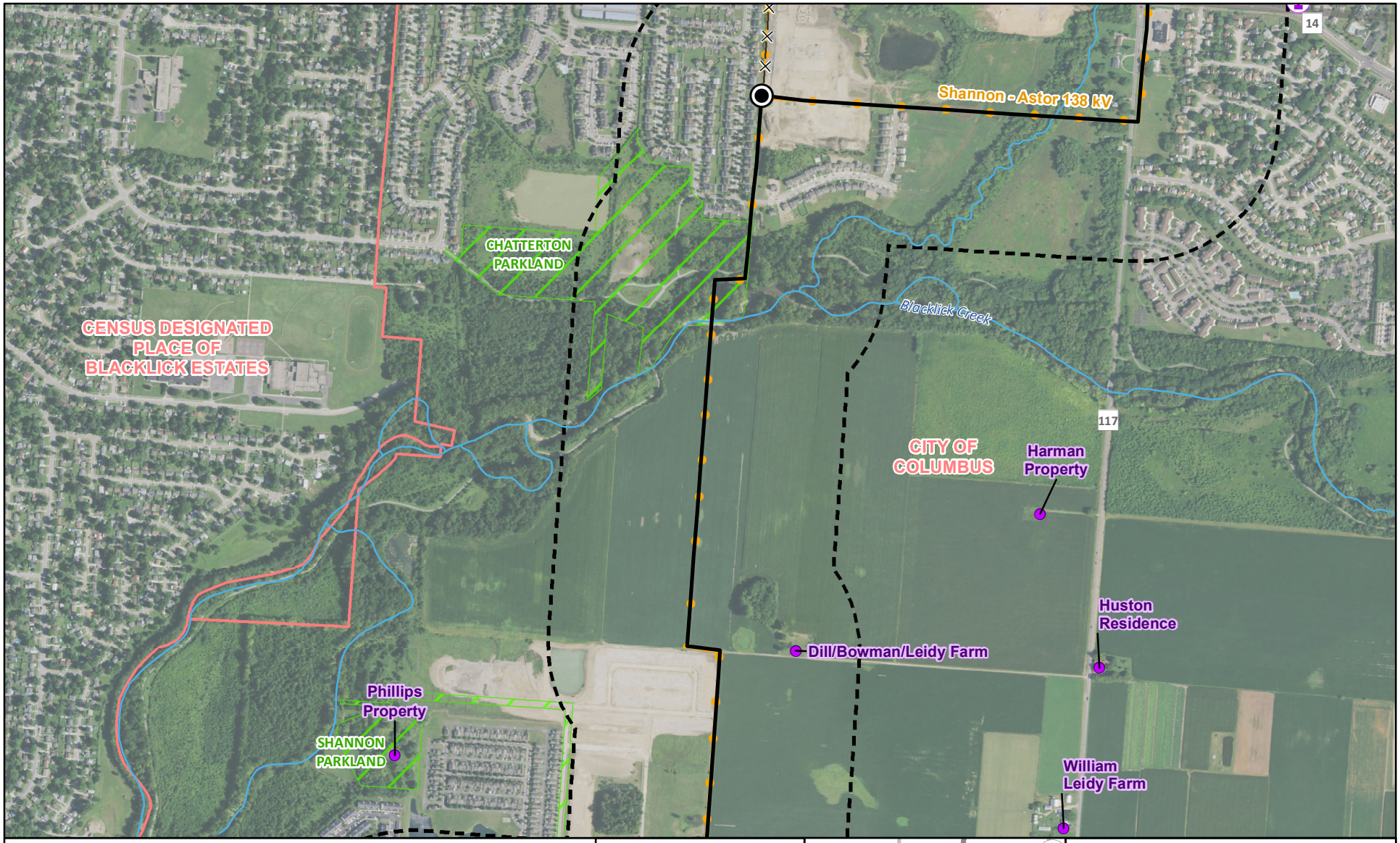
Figure 7-2B
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


Shannon - Astor 138 kV
WALNUT VIEW PARK
Ray Clark House
NYC RR Brice Station
INDEPENDENCE VILLAGE PARK
SHELBOURNE PARKLAND
VILLAGE OF BRICE
CITY OF COLUMBUS
222
117
Ray House
Brice United Methodist Church
Refugee - Groves Road 138 kV
CHATTERTON BRICE PARKLAND
340
Powell Cemetery
TRURO TOWNSHIP
MADISON TOWNSHIP
Cook-Motts Co Barn
14
CHATTERTON PARKLAND
Known Architectural Site
Cemetery
Refugee Switch (to be removed)
Railroad
Preferred Route
Existing Transmission to be Retired
Existing Transmission Line
138 kV
Railroad
NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)
State Plane Ohio South
NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-2C
Recreational and Cultural Resources
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV
Transmission Line Project
0
1,000
2,000
Feet



Known Architectural Site
Cemetery
Refugee Switch (to be removed)
Preferred Route
Existing Transmission to be Retired

Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

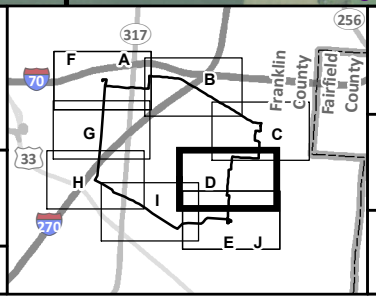
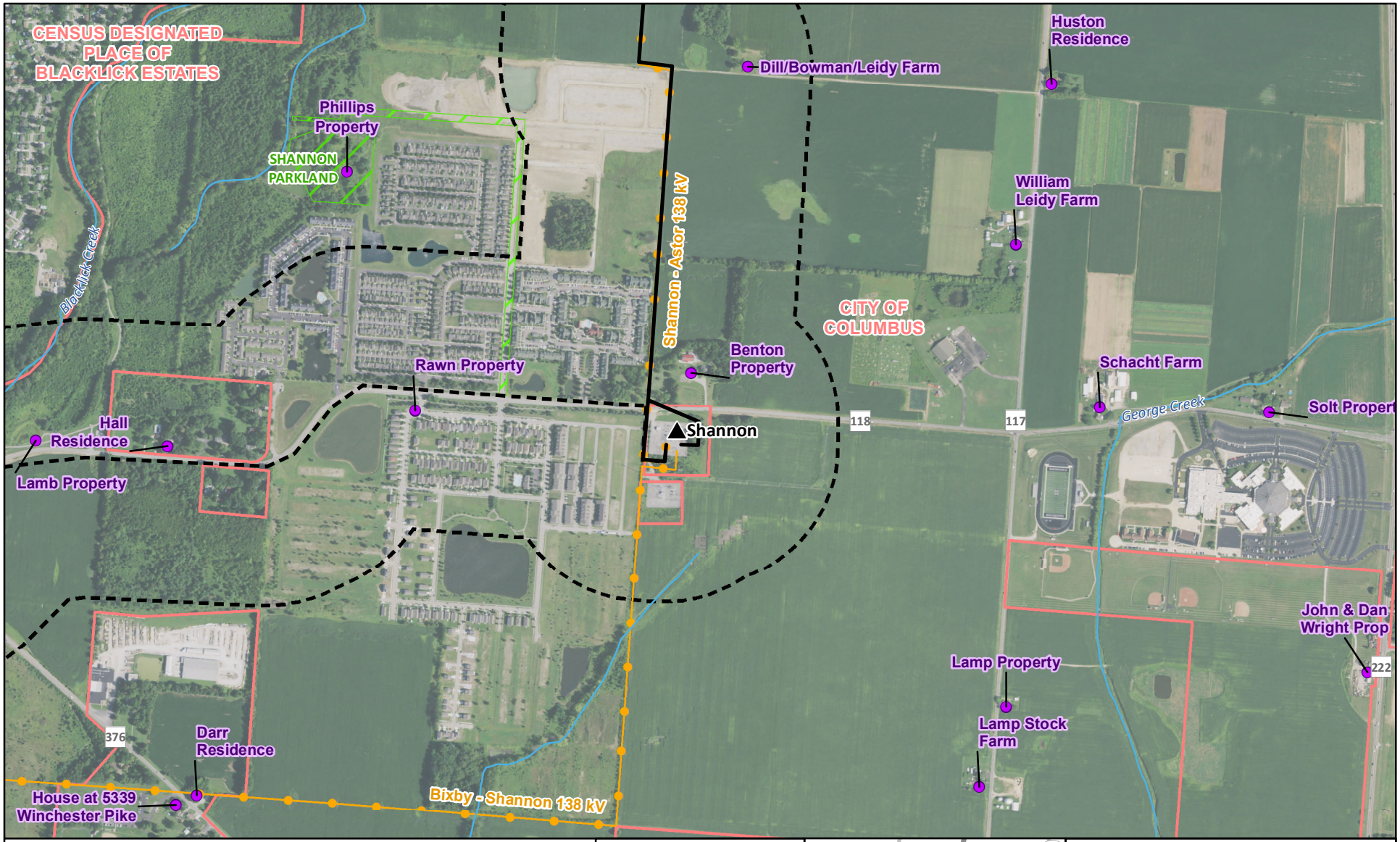


Figure 7-2D
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Known Architectural Site
Existing Station
Preferred Route
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

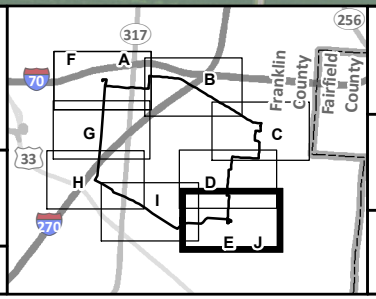
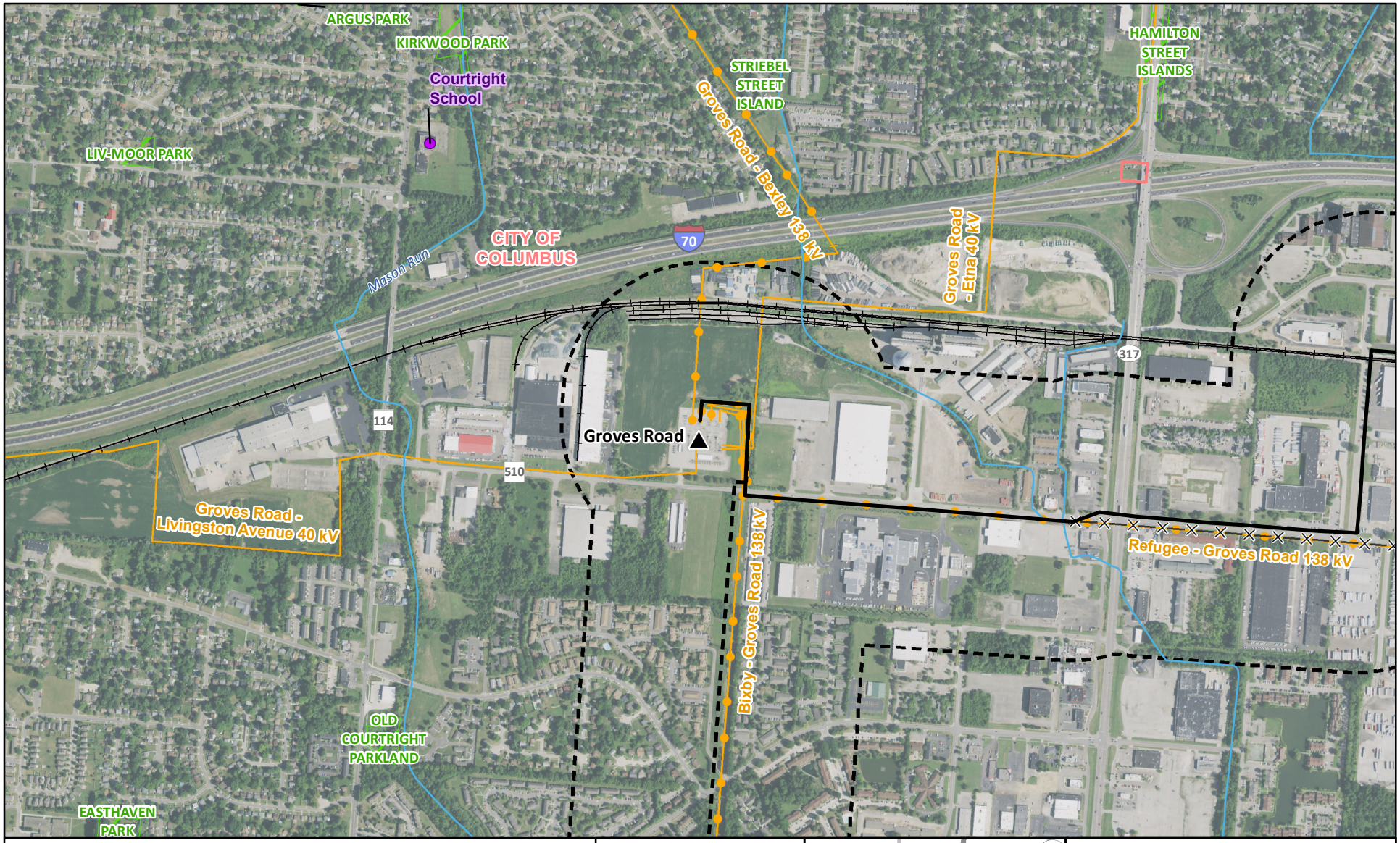


Figure 7-2E
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Known Architectural Site
Existing Station
Railroad
Preferred Route
Alternate Route
Existing Transmission to be Retired

Existing Transmission Line
69 kV and below
138 kV
Railroad
NHD Stream or River
1,000 Foot Buffer

City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

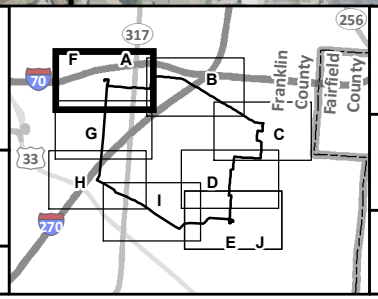


Figure 7-2F
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Known Architectural Site

Alternate Route

Existing Transmission Line

138 kV

NHD Stream or River

1,000 Foot Buffer

City of Columbus Park or Easement Boundary

Township Boundary

Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

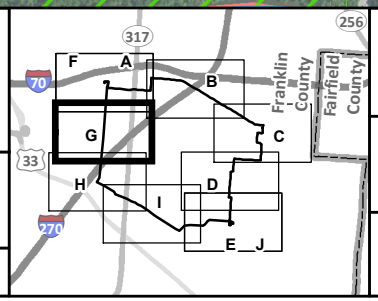
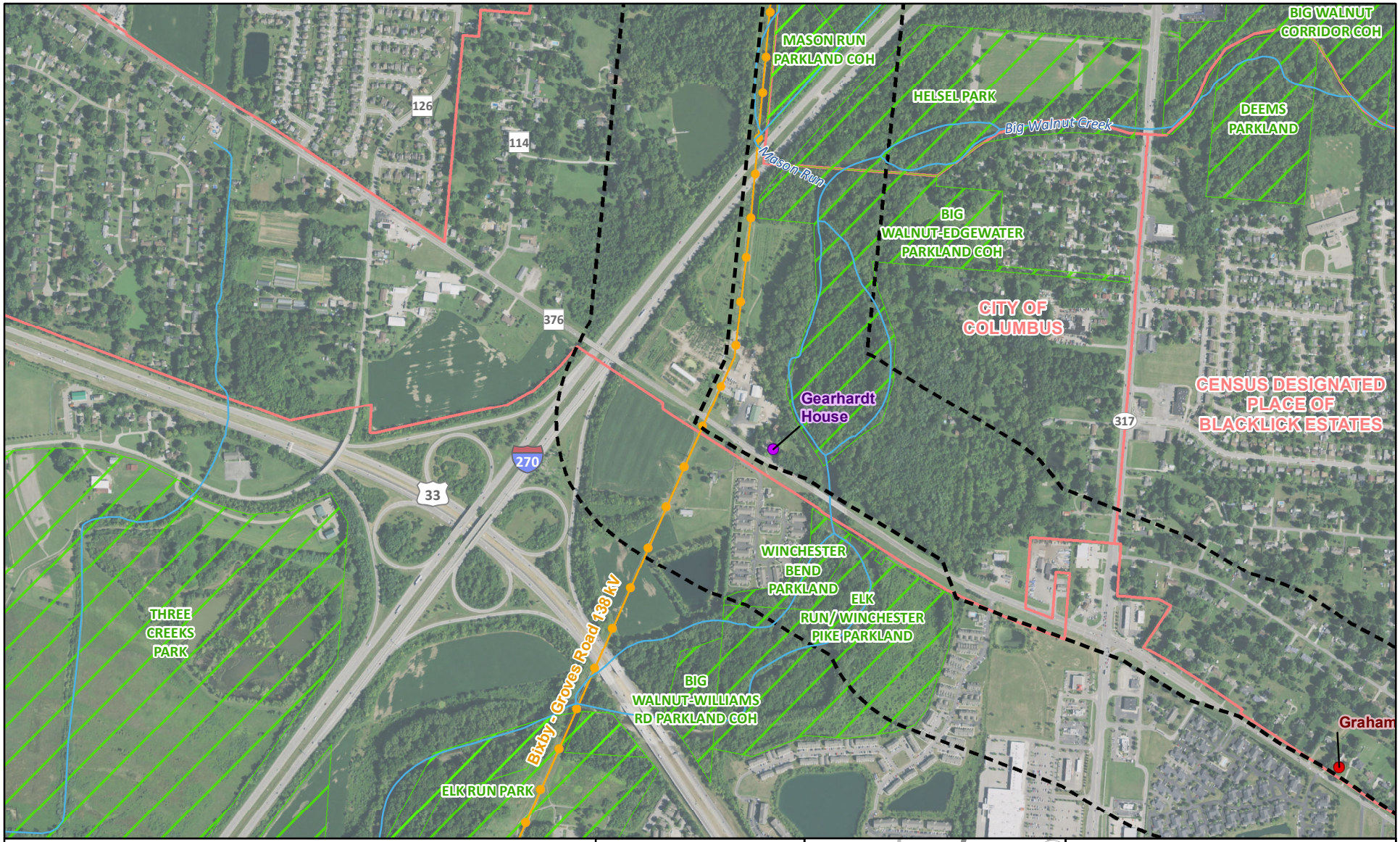


Figure 7-2G
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



NRHP Eligible Architectural Site
Known Architectural Site
Alternate Route

Existing Transmission Line
138 kV
NHD Stream or River

1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

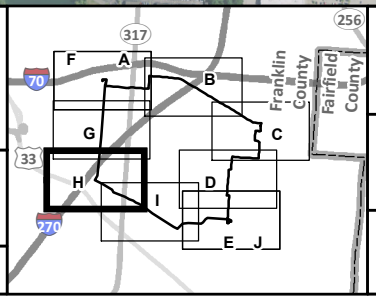
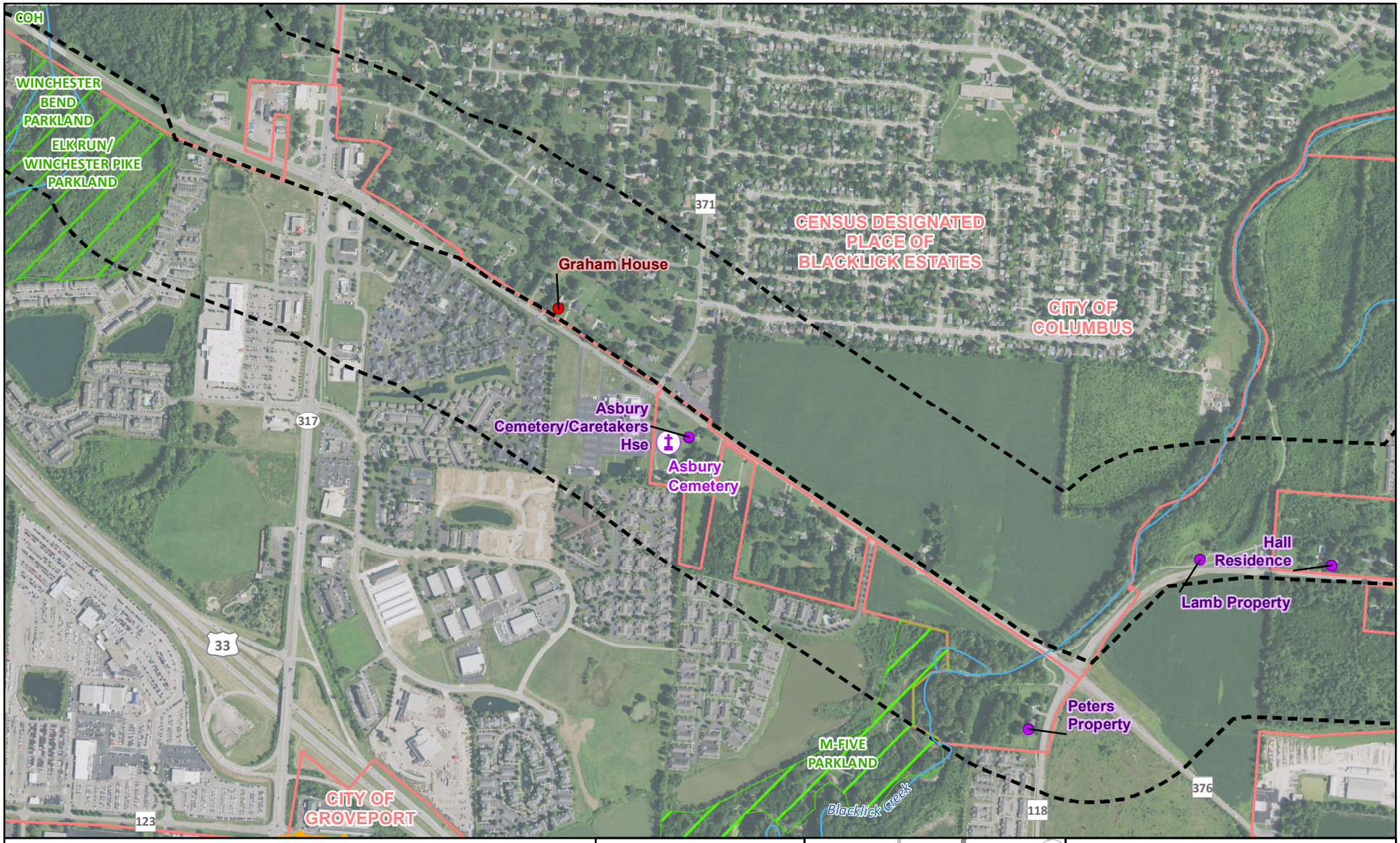


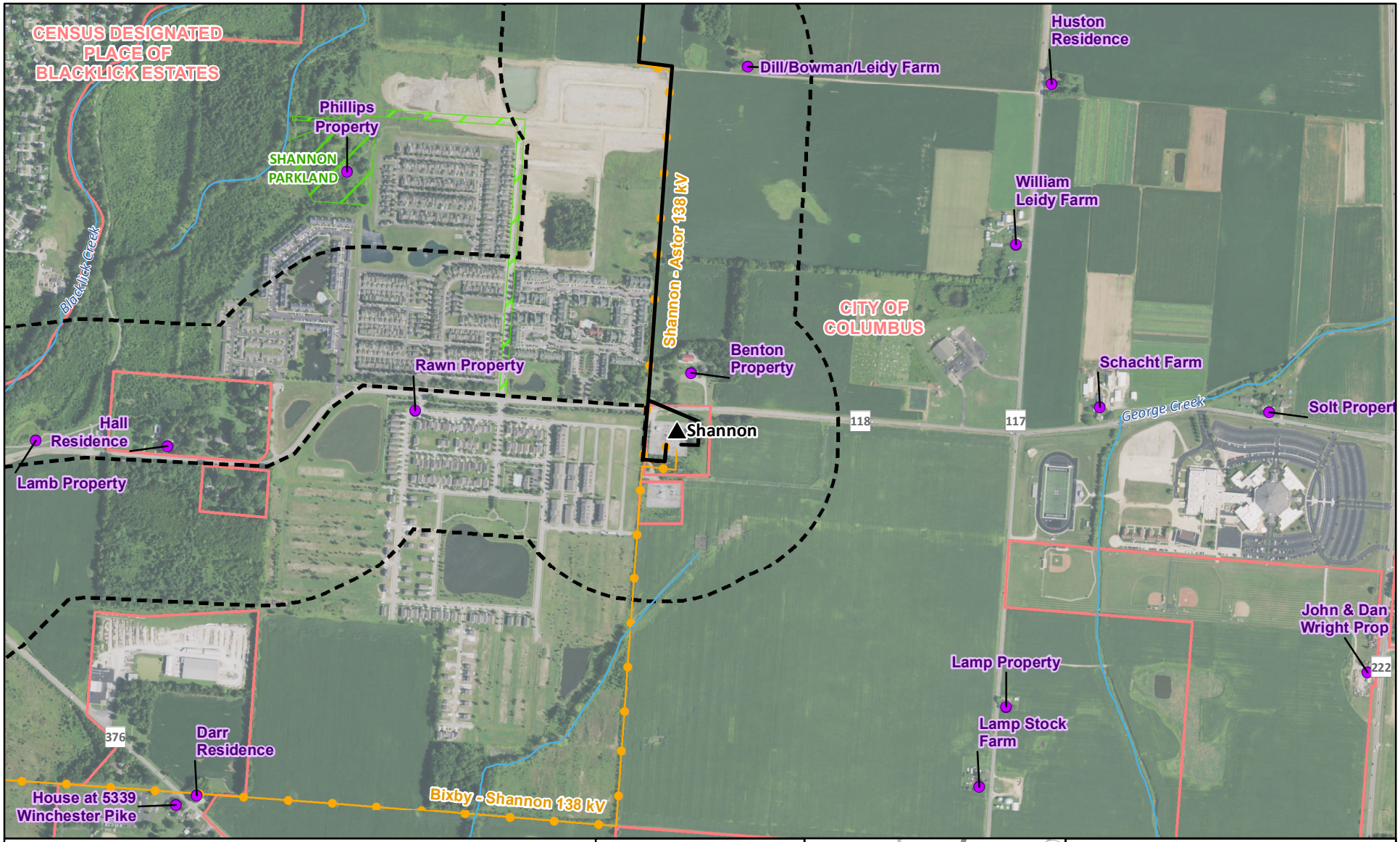
Figure 7-2H
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet


COH
WINCHESTER BEND PARKLAND
ELK RUN/ WINCHESTER PIKE PARKLAND
371
CENSUS DESIGNATED PLACE OF BLACKLICK ESTATES
Graham House
CITY OF COLUMBUS
317
Asbury Cemetery/Caretakers Hse
Asbury Cemetery
Hall Residence
Lamb Property
33
Peters Property
M-FIVE PARKLAND
CITY OF GROVEPORT
Blacklick Creek
123
118
376
NRHP Eligible Architectural Site
Known Architectural Site
Cemetery
Alternate Route
Existing Transmission Line
138 kV
NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary
Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)
State Plane Ohio South
NAD 83
March 03, 2022
317
256
70
33
270
A
B
C
D
E
F
G
H
I
J
Franklin County
Fairfield County
Figure 7-2l
Recreational and Cultural Resources
AEP OHIO TRANSMISSION COMPANY
Groves Road - Shannon 138 kV
Transmission Line Project
0
1,000
2,000
Feet



Known Architectural Site
Existing Station
Preferred Route
Alternate Route

Existing Transmission Line
138 kV

NHD Stream or River
1,000 Foot Buffer
City of Columbus Park or Easement Boundary
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017), ESRI (2021), ODOT (2021), SHPO (2021), NAIP (2019), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

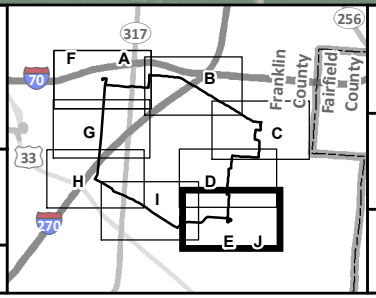


Figure 7-2J
Recreational and Cultural Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet

4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS 8-1

(A) ECOLOGICAL MAP 8-1

(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS 8-1

(1) Vegetative Communities, Wetlands, and Streams in Study Area 8-2

(2) Delineation Result Mapping 8-14

(3) Construction Impacts on Vegetation and Surface Waters 8-14

(4) Operation and Maintenance Impacts on Vegetation and Surface Water 8-19

(5) Mitigation Procedures 8-20

(C) LITERATURE SURVEY OF THE PLANT AND ANIMAL LIFE POTENTIALLY AFFECTED BY THE FACILITY 8-23

(1) List of species Identified Within Project Vicinity 8-23

(2) Construction Impact 8-41

(3) Operation and Maintenance Impact 8-41

(4) Mitigation Procedures 8-42

(D) SITE GEOLOGY 8-42

(1) Local Geology 8-42

(2) Slopes and Soil Suitability for Foundation Construction 8-42

(E) ENVIRONMENTAL AND AVIATION COMPLIANCE INFORMATION 8-44

(1) List and Discussion of Permits Required 8-44

(2) Description, Quantification, Characterization, Removal, and Disposal of Construction Debris 8-44

(3) Storm Water and Erosion Controls during Construction and Restoration of Soils, Wetlands, and Streams Disturbed as a Result of Construction of the Facility 8-45

(4) Plans for Disposition of Contaminated Soil and Hazardous Materials Generated or Encountered During Construction 8-47

(5) Maximum Height of Above Ground Structures 8-48

(6) Construction during Excessively Dusty or Excessively Muddy Soil Conditions 8-49

Table 8-1. NWI Wetlands within 1,000 feet of the Preferred Route and Alternate Route 8-5
Table 8-2. Delineated Wetlands within the Preferred Route and Alternate Route Survey Corridor 8-8
Table 8-3. Streams within the Preferred Route and Alternate Route Survey Corridor 8-12
Table 8-4. Approximate Vegetation Impacts Along the ROW 8-15
Table 8-5. ODNR and UFSWS Listed Species within the Project Area 8-26

4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS

In early 2020 and the summer of 2021, the Company conducted a study to assess the potential effects of construction and operation of the proposed Project on the ecology of the Project area. Available GIS data and published literature was reviewed for a 1,000-foot survey area on either side of the centerline of both the Preferred and Alternate Routes. Subsequently, a field survey of ecology habitat and features was performed on a 260-foot-wide corridor for the Preferred and Alternate Routes (Field Survey Area)[1]. These studies are discussed in the following sections.

(A) ECOLOGICAL MAP

Maps at 1:12,000 (1 inch = 1,000 feet) illustrating areas within 1,000 feet of the Preferred Route and Alternate Route are presented as **Figures 7-1A** through **Figure 7-1J**. These maps depict transmission line alignments, station locations, and land use classifications, including vegetative cover[2]. Features within 1,000 feet of the proposed routes were identified from published data and, where accessible, verified by the field ecological survey.

Maps at 1:12,000-scale depicting lakes, ponds, reservoirs, highly erodible soils, slopes of 12 percent or greater, wildlife areas, nature preserves, conservation areas, and proposed ROW are provided as **Figures 8-1A through 8-1J**. More detailed maps at 1:6,000-scale depicting delineated features within the survey corridor are provided as **Figures 8-2A** through **Figure 8-2V**.

(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS

In June and July 2021, the Company's consultants conducted a field survey of the Preferred Route and Alternate Route. The Preferred Route and Alternate Route Field Survey Areas were 260 feet wide[1]. The purpose of the field survey was to assess whether wetlands and other "waters of the

[1] The Company requested a waiver for a portion of the Preferred Route, which would limit the FSA on the south side of the railroad corridor. The Company's limited waiver was subsequently approved by the OPSB and therefore vegetation and surface water features were not collected for this portion of the Preferred Route.

[2] Land Use classifications discussed in Section 7 were obtained by imagery from the National Agricultural Imagery Program (NAIP) obtained from the United States Department of Agriculture (dated 2015). The data shown on these maps do not depict areas that were field verified.

U.S." exist within the Field Survey Area. During the field survey, the physical boundaries of observed water features were recorded using submeter accurate Trimble Global Positioning System (GPS) units. The GPS data was imported into ArcMap GIS software, where the data was then reviewed and edited for accuracy.

Prior to conducting field surveys, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps and USGS 7.5-minute topographic maps were reviewed to help identify the occurrence and location of potential wetland areas.

Published information regarding existing flora and fauna was requested from the Ohio Department of Natural Resources - Division of Wildlife (ODNR-DOW). This request included researching the Ohio Natural Heritage Database (ONHD) for available GIS shapefiles of records of state-listed species within one mile of the Project. The information provided by the ODNR-DOW identified several ONHD records of state-listed species within a one-mile radius of the Project, in addition to identifying several state and/or federal listed species with known ranges within the Project. More detail on the data provided by the ODNR-DOW is provided in Section 4906-05-08(C)(1) and **Appendix 8-2**.

(1) Vegetative Communities, Wetlands, and Streams in Study Area

(a) Woody and Herbaceous Vegetation Land

Woody and herbaceous vegetation were identified along the proposed routes during the field reconnaissance. As discussed in **Appendix 8-1**, the Preferred and Alternate Routes cross a mix of agricultural land, urban areas, landscaped areas, old field, scrub/shrub, successional hardwood woodland, and ponds, wetlands, and streams. A variety of woody and herbaceous lands, as described below, are present within the proposed ROW of both routes. Habitat descriptions, applicable to both the Preferred Route and Alternate Routes and details on the expected impacts of construction are provided below. Vegetated land cover was initially digitized using imagery from ESRI obtained from GIS and later adjusted during field surveys to ensure land use accuracy. Vegetated land cover can be seen visually from aerial photography provided on **Figures 8-2A** through **8-2J**. The types and approximate amounts of woody and herbaceous vegetation along the Preferred and Alternate Routes are discussed in the following paragraphs.

Agricultural Land: Areas seasonally cultivated with row crops of corn (*Zea mays*) or soybeans (*Glycine max*). Approximately 5.4 acres (11%) of the Preferred Route ROW and 3.4 acres (9.2%) of the Alternate Route ROW contain agricultural land.

Landscaped Area: maintained grassland that is periodically disturbed by maintenance activities (e.g., mowing) within residential or commercial properties. Approximately 12.8 acres (26.4%) of Preferred Route ROW and 14.1 acres (37.6%) of Alternate Route ROW contain landscaped area habitat.

Old Field: This community type is an early stage of succession following disturbance. Old Field communities are generally short-lived, giving way progressively to shrub and forest communities unless periodically re-disturbed. Common plant species observed include Canada goldenrod (*Solidago canadensis*), common goldenrod (*Solidago altissima*), hemp dogbane (*Apocynum cannabinum*), annual ragweed (*Ambrosia artemisiifolia*), and giant ragweed (*Ambrosia trifida*). Approximately 3.3 acres (6.8%) of the Preferred Route ROW and 2.8 (7.5%) of the Alternate Route ROW contain old field habitat.

Palustrine Emergent (PEM) Wetland: Moderate disturbance/natural wetland community dominated by native herbaceous species and/or opportunistic invaders. Common plant species observed include giant goldenrod (*Solidago gigantea*), reed canary grass (*Phalaris arundinacea*), spotted joe-pye weed (*Eutrochium maculatum*), woolgrass (*Scirpus cyperinus*), common reed (*Phragmites australis*), soft rush (*Juncus effusus*), and dark green bulrush (*Scirpus atrovirens*). Approximately 0.3 acres (0.7%) of Preferred Route ROW and 0.8 acres (2%) of Alternate Route ROW contain PEM wetland habitat. Detailed wetland descriptions and anticipated impacts are provided in **Table 8-2**.

Palustrine Scrub-Shrub Wetland: Moderate disturbance/natural wetland community dominated by native herbaceous species, native woody species and/or opportunistic invaders. Common plant species observed include gray dogwood (*Cornus racemosa*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), cottonwood (*Populus deltoides*), woolgrass, hemp dogbane, giant goldenrod, poison ivy (*Toxicodendron radicans*), and riverbank grape (*Vitis riparia*). Less than 0.01 acres (<0.01%) of the Preferred ROW and 0.02 acres (<0.01%) contains PSS wetland habitat.

Palustrine Forested (PFO) Wetland: Moderate disturbance/natural wetland community dominated by native woody and herbaceous species and/or opportunistic invaders. Common species observed include silver maple (*Acer saccharinum*), pin oak (*Quercus palustris*), box elder (*Acer negundo*), green ash, American sycamore (*Platanus occidentalis*), cottonwood, poison ivy, fowl manna grass (*Glyceria striata*), rice cutgrass (*Leersia oryzoides*), giant goldenrod, and red fescue (*Festuca rubra*). Approximately 0.3 acres (0.7%) of Preferred Route ROW and 0.2 acres (0.5%) of Alternate Route ROW contain PFO wetland habitat.

Ponds: Man-made retention ponds or surface water impoundments were observed both within and beyond the survey corridor for the Project, generally located near residential subdivisions. Approximately 0.1 acres (0.2%) of the Preferred Route ROW and 0.2 acres (0.6%) of the Alternate Route ROW contain ponds.

Scrub-Shrub: Scrub-Shrub habitats represent the successional stage between old field and second growth forest, and often emerge in recently harvested forests responding to the lack of overhead canopy. Common plant species observed include Russian olive (*Elaeagnus umbellata*), green ash, cottonwood, white mulberry (*Morus alba*), Amur honeysuckle (*Lonicera maackii*), Japanese honeysuckle (*Lonicera japonica*), and Tartarian honeysuckle (*lonicera tatarica*). Approximately 3 acres (6.3%) of the Preferred Route ROW and 2.7 acres (7.2%) of the Alternate Route ROW contain upland scrub-shrub habitat.

Streams: Streams with perennial or intermittent flow regimes were observed both within and beyond the survey corridor for the Project. Detailed stream descriptions and expected impacts are provided in **Table 8-3**.

Successional Hardwood Woodland: Successional Hardwood Woodland habitats represent the younger life stages of second growth forest. Common species observed include cottonwood, green ash, black walnut (*Juglans nigra*), Osage orange (*Maclura pomifera*), and box elder. Approximately 11.2 acres (23.1%) of the Preferred Route ROW and 6.5 acres (17.3%) of the Alternate Route ROW contain upland successional hardwood woodland habitat.

Urban: Extreme disturbance comprised of paved, graveled areas associated with existing facilities, buildings, and transportation corridors. Approximately 11.5 acres (23.6%) of Preferred Route and 6.3 acres (16.7%) of Alternate Route ROW contain urban land uses.

No wildlife areas, nature preserves, or publicly identified conservation areas are crossed by the proposed Preferred Route and Alternate Route. On August 4, 2021, the ODNR, Division of Wildlife (DOW) replied to an e-mail request for ONHD records of wildlife areas, nature preserves, and conservations areas. The ODNR response indicated four managed areas [Pickerington Ponds Metro Park, Three Creeks Metro Park, Big Walnut Greenway, and Blacklick Creek Greenway Trail – Columbus & Franklin Co. Metro Parks] are within a one-mile radius of the Project.

(b) Wetlands

According to the United States Army Corps of Engineers (USACE), wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytic) typically adapted for life in saturated (hydric) soil conditions.

(i) Summary of National Wetlands Inventory Data

The Company's consultant used the onsite methodology established by USACE 1987 Wetland Delineation Manual (1987 Manual) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE, 2010) to identify wetlands within the Project. Additionally, each identified wetland was evaluated in accordance with the Ohio Rapid Assessment Method (ORAM) developed by the Ohio Environmental Protection Agency (OEPA) (Mack, 2001). Wetland categorizations were conducted in accordance with the latest quantitative score calibration procedure (Mack, 2001). Prior to on-site delineation and evaluation wetlands, a desktop review of USFWS NWI maps, as well as NRCS soil surveys and hydric soil lists for Franklin County, were reviewed for areas within 1,000 feet of the Preferred Route and Alternate Route to identify potential wetlands. NWI areas are shown on **Figures 8-1A** through **8-1J** and summarized by wetland classification and habitat below in **Table 8-1**. The actual extent and type of field delineated wetlands along the routes are discussed in the next section.

Table 8-1. NWI Wetlands within 1,000 feet of the Preferred Route and Alternate Route

NWI Wetland Description	NWI Code	NWI Habitat Type	Total Number of NWI Wetlands
Freshwater Emergent Wetland	PEM1A	Palustrine emergent, persistent, temporary flooded	Preferred – 3 Alternate – 1

Table 8-1. NWI Wetlands within 1,000 feet of the Preferred Route and Alternate Route			
NWI Wetland Description	**NWI Code**	**NWI Habitat Type**	**Total Number of NWI Wetlands**
	PEM1C	Palustrine emergent, persistent, seasonally flooded	Preferred – 3 Alternate – 13
	PEM1F	Palustrine emergent, persistent, semi-permanently flooded	Preferred – 1 Alternate – 1
Freshwater Forested/Shrub Wetland	PFO1C	Palustrine forested, broad-leaved deciduous, seasonally flooded	Preferred – 0 Alternate – 1
	PSS1C	Palustrine scrub-shrub, broad-leaved deciduous, seasonally flooded	Preferred – 0 Alternate – 5
	PSS1F	Palustrine scrub-shrub, broad-leaved deciduous, semi-permanently flooded	Preferred – 0 Alternate – 2
Freshwater Pond	PUBGx	Palustrine unconsolidated bottom, intermittently exposed, excavated	Preferred – 15 Alternate – 25
Riverine	R2UBH	Riverine, lower perennial, unconsolidated bottom, permanently flooded	Preferred – 1 Alternate – 1
	R4SBC	Riverine, intermittent, streambed, seasonally flooded	Preferred – 1 Alternate – 1
	R5UBH	Riverine, unknown perennial, unconsolidated bottom, permanently flooded	Preferred – 7 Alternate – 6
Total Number of Preferred Route NWI Wetlands within 1,000 feet:			**31**
Total Number of Alternate Route NWI Wetlands within 1,000 feet:			**56**

(ii) Field Delineated Wetlands

The Company's consultant identified 16 wetlands totaling 5.04 acres in the combined Project Environmental Survey Corridor ("ESC"). Two wetlands are within the ESC of both the Preferred

Route and Alternate Route; therefore, there is an approximate 0.15 acre overlap of the total acreages listed below.

Ten wetlands totaling 1.81 acres were identified within the 260-foot wide survey corridor along the Preferred Route, and 0.69 acre within the proposed 60 foot wide ROW. Four of the 10 wetlands are crossed by the Preferred Route centerline, for a total length of 521 linear feet.

Eight wetlands totaling 3.38 acres were identified within the 260-foot wide survey corridor along the Alternate Route, and 0.99 acre within the proposed 60 foot wide ROW. Three of these nine wetlands are crossed by the Alternate Route centerline, for a total length of 739 linear feet.

Representative photographs of wetlands identified during the field reconnaissance and completed USACE and ORAM forms are included in **Appendix 8-1**. Field delineated wetlands within the survey corridor are mapped on **Figures 8-2A** through **8-2V** and are summarized below in **Table 8-2.**

Table 8-2. Delineated Wetlands within the Preferred Route and Alternate Route Survey Corridor[2]								
Wetland Name	**Route**	**Figure**	**Cowardin Wetland Type [a]**	**ORAM Score**	**ORAM Category**	**Length Crossed by Centerline (feet)**	**Acreage Within Survey Corridor**	**Acreage within Proposed Maintained ROW [b]**
Preferred Route Wetlands								
Wetland AS-02	Preferred	8-2I and 8-2J	PEM	20.5	1	123	0.21	0.16
Wetland AS-03	Preferred	8-2L	PEM	22.5	1	0	0.47	0.05
Wetland GS-07	Preferred	8-2K	PEM	16	1	0	0.05	0
Wetland GS-08	Preferred	8-2E and 8-2F	PEM	41	Modified 2	0	0.21	0
Wetland GS-09	Preferred	8-2D and 8-2E	PEM	43	Modified 2	46	0.14	0.07
Wetland GS-10	Preferred	8-2C and 8-2D	PFO	55	2	0	0.07	0
Wetland GS-11	Preferred	8-2B, 8-2C, and 8-2D	PFO	48	2	310	0.40	0.35
Wetland GS-12	Preferred	8-2B, 8-2C, and 8-2D	PEM	56	2	42	0.11	0.06
Wetland GS-13*	Preferred	8-2A	PEM	18	1	0	0.13	0
Wetland SS-01*	Preferred	8-2L	PSS	12.5	1	0	0.02	< 0.01
					Total	**521**	**1.81**	**0.69**
Alternate Route Wetlands								
Wetland GS-01	Alternate	8-2N	PEM/PFO	28	1	112	0.47	0.15

[2] The survey corridor referenced during field surveys of the Preferred Route and Alternate Route was generally 260 feet in width, apart from areas confined to the Company's existing 200-foot-wide easement (Alternate Route) and areas south of the existing railroad corridor (Preferred Route).

Table 8-2. Delineated Wetlands within the Preferred Route and Alternate Route Survey Corridor[2]

Wetland Name	Route	Figure	Cowardin Wetland Type [a]	ORAM Score	ORAM Category	Length Crossed by Centerline (feet)	Acreage Within Survey Corridor	Acreage within Proposed Maintained ROW [b]
Wetland GS-02	Alternate	8-2O and 8-2P	PEM/PSS	36	Modified 2	539	1.26	0.65
Wetland GS-03	Alternate	8-2P	PEM/PFO	51	2	88	0.35	0.15
Wetland GS-05	Alternate	8-2P and 8-2Q	PEM/PUB	35	Modified 2	0	0.07	0.02
Wetland GS-06	Alternate	8-2Q	PSS	34	1 or 2 Grey Zone	0	0.13	0
Wetland GS-13*	Alternate	8-2M	PEM	18	1	0	0.13	0
Wetland GS-14	Alternate	8-2T and 8-2U	PFO	43	Modified 2	0	0.95	0.03
Wetland SS-01*	Alternate	8-2U and 8-2V	PSS	12.5	1	0	0.02	0
					Total	**739**	**3.38**	**0.99**

[a] Cowardin Wetland Type: PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested; PUB = palustrine unconsolidated bottom; Cowardin, et al. 1979.

[b] Acreage within Proposed Maintained ROW: "0" indicates the wetland is not within the proposed ROW.

* Indicates the delineated wetland was determined to be within the boundary of both the Preferred Route Survey Corridor and the Alternate Route Survey Corridor.

(c) Waterbodies

(i) Field Delineated Streams

Streams were identified using USGS topographic maps, aerial photography, and field reconnaissance. Stream evaluations were conducted for streams identified within the Preferred Route and Alternate Route survey corridors. Representative photographs are provided in **Appendix 8-1**. Streams that drain areas greater than one square mile were assessed using the Ohio EPA's Qualitative Habitat Evaluation Index (QHEI) method (Rankin, 1989). Within the QHEI scoring convention, streams are classified based on their drainage area. QHEI streams that drain an area greater than 20 square miles are classified as "large streams," and streams that drain an area less than 20 square miles are classified as "headwater streams." QHEI-classified streams then receive a narrative rating based upon their score. The narrative rating gives a general indication of aquatic assemblages that may be found at any given site. Five narrative ratings scale the 100-point scoring system. Very poor streams have a QHEI score less than 30. Poor streams have a QHEI score between 30 and 42. Fair streams have a QHEI score between 43 and 54. Good streams have a QHEI score between 55 and 69. Streams that have a QHEI score greater than or equal to 70 are classified as excellent.

Three unnamed perennial tributaries were assessed using the QHEI methodology within the survey corridor. The evaluations were conducted at or near the proposed transmission line crossing of each stream.

Big Walnut Creek, Blacklick Creek, and Mason Run have existing Warmwater Habitat aquatic life use designations per Ohio Administrative Code (OAC) Chapter 3745-1-09 (OEPA, 2021a); therefore, QHEI evaluations were not performed on these perennial streams.

Streams with a drainage basin less than one square mile (mi^2) were evaluated using the Ohio EPA's Headwater Habitat Evaluation Index (HHEI) method (OEPA, 2020). The HHEI is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. Headwater streams are typically considered to be first- and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessed areas

result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class 1 PHWH Streams," 30 to 69.9 are "Class 2 PHWH Streams," and 70 to 100 are "Class 3 PHWH Streams." There is flexibility and some "gray areas" in the scoring system; a stream can score relatively high, but actually belong in a lower class, and vice-versa. Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream.

HHEI evaluations were conducted on two streams within the survey corridors, one along the Preferred Route corridor and one along the Alternate Route corridor. The evaluations were conducted at or near the proposed transmission line crossing of each stream.

Delineated streams are shown on **Figures 8-2A** through **8-2J**. Copies of the QHEI and HHEI evaluation forms for the streams assessed within the survey corridor of the routes are included in **Appendix 8-1**. As shown below, **Table 8-3** lists the attributes of each delineated stream within the Preferred Route and Alternate Route, including QHEI and/or HHEI score where appropriate, flow regime, bankfull width, stream length within the survey corridor, and stream length within the proposed maintained ROW, respectively.

The Company's consultant identified 10 streams totaling 4,621 linear feet were identified within the combined Project ESC.

Six streams totaling 2,568 linear feet were identified within the survey corridor along the Preferred Route; of which, 667 linear feet are within the proposed ROW. One of the six streams (AS-08) is crossed by the Preferred Route three times, and four streams (GS-05, AS-07, AS-06, and GR-01) are crossed by the Preferred Route centerline once, for a total of seven stream crossings. Stream GS-06 is not crossed by the Preferred Route.

Four streams totaling 2,053 linear feet were identified within the survey corridor of the Alternate Route; of which, 440 linear feet are within the proposed ROW. All four streams are crossed by the Alternate Route centerline only once.

Table 8-3. Streams within the Preferred Route and Alternate Route Survey Corridor[3]									
Stream Name	**Route**	**Figure**	**Stream Flow Regime**	**Form**	**Score**	**Class/ Designation**	**Top of Bank Width (feet)**	**Length (linear feet) within Survey Corridor**	**Length (linear feet) within ROW[a]**
Preferred Route Streams									
Stream GS-05 (Big Walnut Creek)	Preferred	8-2B, 8-2C, and 8-2D	Perennial	N/A	N/A	Warmwater Habitat	160	276	60
Stream GS-06 (UNT to Big Walnut Creek)	Preferred	8-2D and 8-2E	Perennial	HHEI	40	Small Drainage Warmwater Stream	10	22	0
Stream AS-06 (UNT to Blacklick Creek)	Preferred	8-2H, 8-2J, and 8-2K	Perennial	QHEI	43	Fair Warmwater Habitat	26	350	70
Stream AS-07 (Blacklick Creek)	Preferred	8-2I and 8-2J	Perennial	NA	N/A	Warmwater Habitat	140	526	62
Stream AS-08 (UNT to Blacklick Creek)	Preferred	8-2G and 8-2H	Perennial	QHEI	47	Fair Warmwater Habitat	24	1,140	221
Stream GR-01 (UNT to Big Walnut Creek)	Preferred	8-2A and 8-2B	Perennial	QHEI	35	Poor Warmwater Habitat	12	254	254
							Total	**2,568**	**667**
Alternate Route Streams									
Stream GS-01 (Mason Run)	Alternate	8-2O and 8-2P	Perennial	N/A	N/A	Warmwater Habitat	30	1,115	107

[3] The survey corridor referenced during field surveys of the Preferred Route and Alternate Route was generally 260 feet in width, apart from areas confined to the existing 200-foot-wide ROW (Alternate Route) and areas south of the existing railroad corridor (Preferred Route).

Table 8-3. Streams within the Preferred Route and Alternate Route Survey Corridor[3]									
Stream Name	**Route**	**Figure**	**Stream Flow Regime**	**Form**	**Score**	**Class/ Designation**	**Top of Bank Width (feet)**	**Length (linear feet) within Survey Corridor**	**Length (linear feet) within ROW[a]**
Stream GS-02 (UNT to Mason Run)	Alternate	8-2G and 8-2H	Intermittent	HHEI	40	Small Drainage Warmwater Stream	5	221	186
Stream GS-03 (Big Walnut Creek)	Alternate	8-2Q	Perennial	N/A	N/A	Warmwater Habitat	115	334	68
Stream GS-04 (Blacklick Creek)	Alternate	8-2S and 8-2T	Perennial	N/A	N/A	Warmwater Habitat	60	383	79
							Total	**2,053**	**440**

[a] Length (linear feet) within ROW: "0" indicates the stream is not within the proposed ROW.

(ii) Lakes, Ponds, and Reservoirs

No major lakes or reservoirs were observed along the survey corridor of the Preferred Route or Alternate Route. Seventeen ponds totaling 5.4 acres were identified within the survey corridor; nine associated with the Preferred Route (2.9 acres), and eight associated with the Alternate Route (2.5 acres) during the regulated waters delineations. Five ponds are within the Preferred Route ROW, totaling 0.1 acres, and one pond is within the Alternate Route ROW, totaling 0.2 acres. Locations of ponds within the survey corridor of the routes are identified on **Figures 8-1A** through **8-1J**.

Impacts to ponds and lakes are not anticipated by the construction, operation, or maintenance of the proposed transmission line. Best Management Practices (BMPs), including utilization of silt fencing, will be used as appropriate during construction to minimize runoff siltation.

(2) Delineation Result Mapping

Field delineated streams and wetlands within the survey corridor and proposed ROW are mapped on **Figures 8-2A** through **8-2J** and are summarized in **Tables 8-2** and **8-3**, as discussed in Section 4906-5-08(B)(1).

(3) Construction Impacts on Vegetation and Surface Waters

(a) Construction Impacts on Vegetation

The construction impacts on woody and herbaceous vegetation along the Preferred and Alternate Routes will be limited to clearing within the 60-foot ROW for the proposed transmission line and potentially along access roads. Specific locations for access roads will be identified at the time of The Company's transmission line easement acquisition process. However, where required, trees adjacent to the proposed transmission line ROW that are dead, dying, diseased, leaning, significantly encroaching or prone to failure, may require clearing to allow for safe operation of the transmission line. Vegetation wastes (such as tree limbs and trunks) generated during the construction phase will be windrowed or chipped and disposed of appropriately depending on individual landowner requests. Construction impacts to agricultural land within the existing

transmission ROW is expected to be temporary in nature and limited to vehicle access and temporary lay down activities.

Approximately 30 feet of clearing will occur on either side of the centerline and will be maintained along either the Preferred Route or Alternate Route. When possible, open areas were crossed in the design of the facility. However, some forested areas will need to be cleared. The Preferred Route will require approximately 11.2 acres of forest clearing, and the Alternate Route will require approximately 2.8 acres of forest clearing. The approximate vegetation impacts along the Project ROW are provided in **Table 8-4**.

Clearing of potential Indiana bat roost trees, if any, will occur during a restricted period from October 1st through March 31st to avoid any potential impact to summer tree-roosting bats. All vegetative waste (such as tree limbs and trunks) which is generated during the construction phase will be wind-rowed or chipped and disposed of appropriately.

Table 8-4. Approximate Vegetation Impacts Along the ROW

Land Use Type	Length of Route (feet)	Length of Route (miles)	Acreage within ROW
Preferred Route			
Agricultural Land	4,112	0.8	5.3
Delineated PEM Wetland	216	0.04	0.4
Delineated PFO Wetland	309	0.1	0.3
Delineated Pond	55	0.01	0.1
Delineated Stream	360	0.1	0.5
Landscaped Area	11,371	2.2	12.8
Old Field	2,107	0.4	3.3
Scrub/Shrub	2,537	0.5	3.0
Successional Hardwood Woodland	10,757	2.0	11.2
Urban	4,076	0.8	11.5
Alternate Route			
Agricultural Land	2,954	0.6	3.4
Delineated PEM Wetland	584	0.1	0.8
Delineated PFO Wetland	161	0.03	0.2
Delineated Pond	171	0.03	0.2
Delineated Stream	315	0.1	0.02
Landscaped Area	11,184	2.1	0.02
Old Field	2,202	0.4	0.4
Scrub/Shrub	2,057	0.4	14.1
Successional Hardwood Woodland	5,101	1.0	2.8
Urban	2,519	0.5	2.5

(b) Construction Impacts on Wetlands

Wetlands identified during the ecological survey are described in **Table 8-1**. The Company will avoid the placement of pole structures within wetlands areas to the extent practical. Disturbance of soils in wetland areas during construction will be minimized and no wetlands will be filled along the Preferred or Alternate Routes. Based on current design, one structure (Structure 23) will be placed within Wetland GS-2 along the Alternate Route, as shown in **Figure 8-2O**. This area also contains an existing single pole structures supporting the 138 kV line.

Where pole locations are within a wetland, they will be accessed using construction matting. No excavation other than the boring of a hole will be performed within the wetland. No fill will be placed in the wetlands besides the placement of one pole in a wetland. Wetland areas will be clearly staked before any clearing to minimize incidental vehicle impacts. Other than the pole locations discussed, operation of heavy equipment is not planned in any identified wetland areas, although some construction equipment will need to cross wetland areas. Woody vegetation in wetlands will be hand-cut by chain saws, hydro-axes, or other non-mechanized techniques. When necessary, rubber-wheeled vehicles, or vehicles equipped with tracks, will be used to remove vegetation debris.

Care will be taken where wetlands are located to avoid or minimize filling and sedimentation. Selective clearing will be required to remove woody vegetation in wetlands that might impede construction or interfere with operation of the transmission line.

BMPs such as use of silt fences and construction matting will be implemented as required during construction to control sedimentation. Sedimentation potential at wetlands should be minimal due to the structure placement and the fact that construction equipment will only cross wetlands if necessary and do so using construction matting.

(c) Construction Impacts on Waterbodies

Streams identified during the ecological survey are listed above in **Section 4906-5-08(B)(c)(i), Table 8-3**. The Preferred Route centerline requires seven stream crossings and the Alternate Route centerline requires four stream crossings. Approximately 667 linear feet of streams are located

within the Preferred Route ROW and approximately 440 linear feet of streams are located within the Alternate Route ROW.

The Company will not conduct mechanized clearing within 25 feet of any stream and will only clear (via hand cutting techniques) those trees in this area that are tall enough to or have the potential to interfere with safe construction and operation of the line. None of the streams that occur along the Preferred Route and Alternate Route are expected to be filled or permanently impacted by the Project and will be spanned. Some streams may have to be crossed by construction vehicles, where BMPs will be used. Access roads avoiding waterbodies were also selected in most cases. Existing culverts may be used, where available. If a new stream crossing were necessary, it would comply with one of the two proposed methods to cross streams:

- Temporary culvert stream crossings
- Temporary access bridge

Culvert stream crossings are proposed for crossing marginal quality perennial, ephemeral, and intermittent streams with a drainage basin of less than one square mile. These crossings may be removed or remain in place to provide maintenance access to the line (critical if service is to be reliable).

- Disturbance of the stream will be kept to a minimum, stream bank vegetation will be preserved to the maximum extent practical, and the stream crossing width will be kept as narrow as possible. Clearing will be done by hand cutting techniques rather than grubbing. Roots and stumps will be left in place to aid stabilization and to accelerate re-vegetation.
- Sediment laden runoff will be controlled to minimize flow from the access road directly into the stream. Diversions and swales will be used to direct runoff to stormwater management locations. Silt fencing will be used as needed according to local topographic locations
- Culvert pipes will be placed on the existing streambed to avoid a drop or waterfall at the downstream end of the pipe, which would be a barrier to fish migration. Crossings will be placed in shallow areas rather than pools.

- Culverts will be sized to be at least three times the depth of the normal stream flow at the crossing location. The minimum diameter culvert that will be used is 18 inches.

- There will be a sufficient number of culvert pipes to cross the stream completely with no more than a 12-inch space between each one.

- Stone, rock, or aggregate of ODOT number 1 as a minimum size will be placed in the channel, and between culverts. To prevent washouts, larger stone may be used with gabion mattresses. No soil will be placed in the stream channel.

- After completion of construction, some rock aggregate and structures such as culvert pipes used for the crossing will be left in place, if approved by the landowner. Care will be taken so that aggregate does not create an impoundment or impede fish passage. Structures such as gabion mattresses will be removed.

- Stream banks will be stabilized and revegetated as appropriate.

Temporary access bridges or culvert stream crossings will be used for high quality perennial, ephemeral, and intermittent streams, and streams with a drainage basin greater than one square mile.

- Disturbance of the stream will be kept to a minimum, stream bank vegetation will be preserved to the maximum extent practical, and the stream crossing width will be kept as narrow as possible. Clearing will be done by hand cutting rather than grubbing. Roots and stumps will be left in place to aid stabilization and to accelerate re-vegetation.

- Sediment laden runoff will be controlled to minimize flow from the access road directly into the stream. Diversions and swales will be used to direct runoff to stormwater management locations. Silt fencing will be used as needed according to local topographic conditions.

- Bridges will be constructed to span the entire channel. If the channel width exceeds eight feet, then a floating pier or bridge support may be placed in the channel. No more than one pier, footing, or support will be allowed for every eight feet of span width. No footings, piers, or supports will be allowed for spans of less than eight feet.

- No fill other than clean stone, free from soil, will be placed within the stream channel.

Crossing methods for each stream will be addressed in detail in the Storm Water Pollution Prevention Plan (SWPPP) for the Project. The SWPPP will be provided to the OPSB under separate cover. Some of the access routes may be left in place for maintenance activity or at the request of the landowner.

(4) Operation and Maintenance Impacts on Vegetation and Surface Water

During operation of the transmission line along either of the Preferred or Alternate Routes, the impacts on vegetation are anticipated to be minor. Undeveloped non-forested land not significantly disturbed by construction should retain its current vegetation composition. Periodic cutting along the proposed 60-foot-wide transmission line ROW is not expected to result in a significant environmental impact to vegetation in these areas.

The potential impacts on woody and herbaceous vegetation along either of the Preferred or Alternate Routes will be limited to maintenance activities along the proposed transmission line ROW and access roads for safe and reliable operation of the transmission line. Trees adjacent to the proposed transmission line ROW, that are dead, dying, diseased, leaning, significantly encroaching, or prone to failure may require clearing to allow for safe operation of the transmission line. Vegetative waste (such as tree limbs and trunks) that is generated during the construction phase will be windrowed or chipped and disposed of appropriately depending on individual landowner requests.

Once the transmission line is in operation, no significant impacts to streams or drainage channels are anticipated. Only periodic selective removal of vegetation that interferes with the operation of the transmission line will be required. No major lakes, ponds, or reservoirs should be affected by the operation or maintenance of the Preferred or Alternate Routes.

The Company does not anticipate significant wetland impacts from the operation or maintenance of the Preferred and Alternate Routes. Vegetation that occurs within wetland areas may require periodic cutting. It is not anticipated that such activities would result in erosion or water quality degradation. Maintenance cutting of woody vegetation in wetland areas would be hand-cut by chain saws or other non-mechanized techniques.

(a) Vegetation

During operation of the transmission line along either the Preferred or Alternate Routes, the impacts on vegetated land should be minor. The undeveloped land not disturbed by construction should retain its current vegetation composition and continue successional development at a normal rate. Any periodic cutting along the proposed transmission line ROW is not expected to result in a significant environmental impact to the vegetation.

(b) Streams

Once the transmission line is in operation, no significant impact to streams or drainage channels is anticipated. Only periodic selective removal of vegetation that interferes with the operation of the transmission line will be required. No major lakes, ponds, or reservoirs should be affected by the operation or maintenance of the Preferred or Alternate Routes.

(c) Wetlands

Wetland areas should not be significantly affected by the operation or maintenance of the Preferred and Alternate Routes. Vegetation that occurs within wetland areas may require periodic cutting. It is not anticipated that such activities would result in erosion or water quality degradation. Maintenance cutting of woody vegetation in wetland areas would be hand-cut by chain saws, hydro-axes, or other non-mechanized techniques.

(5) Mitigation Procedures

The following mitigation procedures will be used during construction, operation and maintenance of the proposed Project to minimize the impact on vegetation and surface waters. A SWPPP will also be prepared and implemented and will be made available onsite during Project construction.

(a) Post-construction Site Restoration and Stabilization

Experience shows that seeding in non-wetland and non-agricultural areas is advantageous to control erosion on areas disturbed by construction activities. In lightly disturbed wetland areas, existing seed banks are quite often capable of quickly reestablishing vegetation that is compatible with the surrounding wetland. A SWPPP and BMPs will be implemented during construction to

control erosion. Areas where soil has been disturbed will be seeded and mulched to prevent soil erosion and sedimentation.

Construction activities within wetlands may result in temporary, short-term impacts. Natural revegetation in any disturbed wetland areas will begin after construction crews have completed the installation activities. Wetland mitigation, to the extent necessary, will be addressed as part of the process of obtaining any necessary wetland permits.

In wetland areas, the disturbance will be minor. If any unanticipated significant disturbance occurs in wetlands, topsoil will be segregated and replaced so that the existing seed banks will be allowed to initially revegetate the areas. Additional seeding will only take place if the existing seed bank does not repopulate an area. These measures should preserve the aesthetic qualities along the route, prevent erosion, and promote habitat diversity.

(b) Contingency Plan Stream and Wetland Crossings

The Project does not include a stream or wetland crossing by horizontal directional drill. Therefore, this is not applicable. .

(c) Demarcation and Protection Methods

Wetlands, streams, and any other environmentally sensitive areas will be clearly staked, flagged or fenced in accordance with the SWPPP before any clearing to minimize incidental impacts. BMPs such as use of silt fencing, orange barrier fencing, and other demarcation materials will be implemented as required during construction.

(d) Procedures for Inspection and Repair of Erosion Control Measures

BMPs, including silt fencing and other erosion control measures, will be inspected routinely to assure proper installation and function. Inspections will also be triggered by significant rainfall events, to evaluate the need for repairs or adjustments in erosion control strategy.

(e) Stormwater Runoff Measures

BMPs, including use of silt fence or filter socks, will be used as appropriate during construction to minimize runoff and sedimentation of streams and wetlands. Measures to divert stormwater runoff away from fill slopes and other exposed surfaces will be outlined in the SWPPP.

(f) Vegetation Protection Methods

Vegetation that occurs within wetland areas may require periodic cutting. If this is needed, woody vegetation in wetland areas will hand-cut by chain saws or other non-mechanized techniques. Cutting of woody vegetation in wetlands and near stream banks will be limited to removal of only the cut back required to safely perform construction and continue operation of the transmission line. The Company will adhere to regulatory permit requirements and conditions that will be obtained or authorized for the Project, including specifying that no mechanized clearing of vegetation be performed within the prescribed distance of a wetland or waterbody as discussed below.

(g) Clearing Methods

The Company will not conduct mechanized clearing within 25 feet of any stream and will only clear (using hand cutting techniques) those trees in these areas that are tall enough to or have the potential to interfere with safe and reliable construction and operation of the transmission line. Selective clearing will be required to remove woody vegetation in wetlands that might impede construction or interfere with operation of the transmission line. Where wooded wetlands occur within the ROW, the trees will be removed. Trees adjacent to the proposed transmission line ROW that are dead, diseased, leaning, significantly encroaching, or prone to failure may require clearing to allow for safe and reliable operation of the transmission line. All vegetative waste (such as tree limbs and trunks) which is generated during the construction phase will be wind-rowed or chipped and disposed of appropriately depending on landowner requests.

(h) Herbicide Use for Maintenance

The Company does not anticipate the use of herbicides on the Project.

(C) LITERATURE SURVEY OF THE PLANT AND ANIMAL LIFE POTENTIALLY AFFECTED BY THE FACILITY

The Project area is primarily located in an urban setting with some scattered farmland and wooded areas. The developed area is dominated by residential subdivisions, industrial properties, commercial properties and shopping centers, as well as existing utility or road ROW. Both the Preferred and Alternate Routes have potential habitat for protected wildlife species as well as commercial and recreational species.

Lists of protected species are typically based on their range within Franklin County, as reported in ODNR-DOW and USFWS county species distribution lists. Lists of commercial and recreational species were created utilizing professional experience and the ODNR-DOW 2021-2022 Hunting and Trapping Regulations (ODNR-DOW, 2021b). A list of game fish known to occur in Ohio was obtained from the ODNR-DOW Sport Fish of Ohio Identification Guide (ODNR-DOW, 2012). Details on the expected impacts of construction, operation, maintenance, and mitigation procedures can be found following the threatened and endangered, commercial, and recreational species descriptions as follows.

(1) List of species Identified Within Project Vicinity

(a) Protected Species

The first phase of identifying protected species within the Project area involved a desktop review federal and/or state listed species known to occur in Franklin County. In addition, coordination letters were submitted to the USFWS and ODNR – Office of Real Estate on August 16, 2021, soliciting comments on the Project. Coordination with ODNR also included research of the Natural Heritage Database (GIS) historic records of state listed species at or within a one-mile radius of the Project.

Within a one-mile radius of the Preferred Route, the ODNR National Heritage Database identified historic records of the Tippecanoe darter (*Etheostoma tippecanoe*), a state threatened fish species. Within a one-mile radius of the Alternate Route, the ODNR National Heritage Database identified records of the state threatened Tippecanoe darter and two freshwater mussel species, identified as state species of concern: the elktoe (*Alasmidonta marginate*) and the wavy-rayed lampmussel

(*Lampsilis fasciola*).. No in-water work is proposed for the Project; therefore, impacts to the above-listed freshwater species or their habitat are not anticipated along either route.

In their letters, ODNR-DOW indicated that both routes are within the range of the little brown bat (*Myotis lucifugus*), a state endangered species. Because presence of the state endangered 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 clearing may be acceptable within the Project area after further consultation with DOW.

ODNR-DOW indicated that the Project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. If suitable habitat and roost trees occur within the Project area, ODNR-DOW requests that these trees be conserved. If suitable habitat occurs on the Project area and trees must be cut, ODNR-DOW requests that cutting occur between October 1st and March 31st conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH $\geq$ 20 if possible.

ODNR also indicated that the Project is within the range of 15 state or federally listed mollusk species and 11 state or federally listed fish species. Suitable habitat for these species was observed within the Project (Big Walnut Creek and Blacklick Creek); however, no in-water work is proposed for the Project. According to the ODNR-DOW response letter, the Project is not likely to impact these aquatic species if no in-water work is proposed in a perennial stream. If in-water work cannot be avoided, the DOW recommends working outside of in-water work restriction dates of March 15th through June 30th, in perennial streams to avoid adverse effects to aquatic fish species and recommends mussel surveys, per the Ohio Mussel Protocol in streams with proposed impacts. Regardless of whether in-water work is proposed for the Project, the DOW recommends that impacts to streams, wetlands, and other water resources be avoided and minimized to the fullest extent possible, and that BMPs be utilized to minimize erosion and sedimentation to surface waters within the Project vicinity.

ODNR indicated that the Project is within the range of eight state threatened or endangered bird species; however, no potentially suitable habitat for these species was observed within the Project.

In their letter, ODNR provides each species' nesting period and recommends that construction should be avoided during these timeframes if suitable habitat occurs and is within the construction area. ODNR indicates that these bird species are not likely to be adversely impacted by the Project if no suitable habitat is planned for impact.

Correspondence letters from USFWS and ODNR are included in **Appendix 8-2**. Current information on federal and/or state listed species obtained from agency correspondence is provided below in **Table 8-5**, in addition to observations of potentially suitable habitat and subsequent impact assessment information. The Company will use a 60-foot-wide permanent ROW for the Project to allow for safe and reliable construction and operation of the transmission line and prevent encroachment. The Company will not conduct mechanized clearing within 25 feet of any stream and will only clear (using hand cutting techniques) those trees in this area that are tall enough to have the potential to interfere with safe construction and reliable operation of the line. Once the final route is approved, The Company's consultant will review habitat along the route, based on observations recorded during the completed ecological survey and coordinate with USFWS and ONDR for survey plans if necessary.

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Mammals						
Indiana bat (*Myotis sodalis*)	Endangered	Endangered	Winter hibernacula are provided by caves and mines. Summer roost habitat typically includes live or dead trees with exfoliating bark, crevices, or cavities that can be used for roosting. Open sub-canopy areas and flight corridors are important to allow maneuvering during foraging. Proximity to water sources provides a greater density of insect prey.	Yes	The entire state of Ohio is within the range of these species. The DOW recommends tree cutting only occur from October 1 through March 31.	Suitable habitat identified, within Successional Hardwood Woodlands habitat within the Project area. Utilize recommended clearing window (October 1 through March 31).
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Threatened				
Tricolored bat (*Perimyotis subflavus*)	Endangered	Not Listed				
Little brown bat (*Myotis lucifugus*)	Endangered	Not Listed			The Project is within the vicinity of records of this species. Because presence has been established in the area, summer tree cutting is not recommended. Limited summer tree cutting inside this buffer may be acceptable after further consultation with DOW.	Suitable habitat identified, within Successional Hardwood Woodlands habitat within the Project area. Further consultation with DOW is recommended, if summer tree clearing is required. Alternatively, utilize recommended clearing window (October 1 through March 31).

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Mussels						
Purple cat's paw (*Epioblasma o. obliquata*)	Endangered	Endangered	Commonly inhabits large rivers with sandy gravel substrates. It occurs in water of shallow to moderate depth with a swift current.	Yes	This Project must not have an impact on freshwater native mussels at the Project site. If in-stream work is anticipated, follow Ohio Mussel Protocol to assess for listed and non-listed mussels. If no in-water work is planned, no adverse effects to these species are anticipated.	No in water work is planned, so no adverse effects to these species are anticipated. If in-water work is needed, Mussel surveys, per the Ohio Mussel Protocol are recommended, in streams with proposed impacts.
Clubshell (*Pleurobema clava*)	Endangered	Endangered	Habitat is typically provided by streams and small rivers with well-oxygenated riffles and sand and gravel substrates.	Yes		
Northern riffleshell (*Epioblasma torulosa rangiana*)	Endangered	Endangered	Habitat is typically provided by large streams and small rivers in firm sand of riffle areas.	Yes		
Rayed bean (*Villosa fabalis*)	Endangered	Endangered	Habitat is typically provided by smaller, headwater creeks, but they are sometimes found in large rivers.	Yes		
Snuffbox (*Epioblasma triquetra*)	Endangered	Endangered	Typically found in small to medium-sized creeks and some larger rivers, in areas with a swift current.	Yes		
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	Threatened	Threatened	Typically, occurs in a variety of flowing water habitats including small to medium-sized streams and some larger navigable rivers. It usually occurs in shallow areas along the bank.	Yes		

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Elephant-ear (*Elliptio crassidens crassidens*)	Endangered	Not Listed	Primarily inhabits large rivers in mud, sand or fine gravel.	Yes	This Project must not have an impact on freshwater native mussels at the Project site. If in-stream work is anticipated, follow Ohio Mussel Protocol to assess for listed and non-listed mussels. If no in-water work is planned, no adverse effects to these species are anticipated.	No in water work is planned, so no adverse effects to these species are anticipated. If in-water work is needed, Mussel surveys, per the Ohio Mussel Protocol are recommended, in streams with proposed impacts.
Long solid (*Fusconaia maculata maculate*)	Endangered	Not Listed	Typically, found in small to large rivers in gravel with a strong current.	Yes		
Ohio pigtoe (*Pleurobema cordatum*)	Endangered	Not Listed	Commonly found in strong currents on substrates of sand and gravel.	Yes		
Pocketbook (*Lampsilis ovata*)	Endangered	Not Listed	Creeks to large rivers with quiet to swift current in gravel, sand and cobble — nearly any substrate except for moving sand.	Yes		
Washboard (*Megalonaias nervosa*)	Endangered	Not Listed	Typically, a large river species, inhabiting the main channel areas of a stream. Suitable habitat consists of slow current areas with substrates composed of sand, gravel, or mud.	Yes		
Black sandshell (*Ligumia recta*)	Threatened	Not Listed	Most commonly occupies rivers with strong currents and lakes with a firm substrate of gravel or sand.	Yes		
Fawnsfoot (*Truncilla donaciformis*)	Threatened	Not Listed	Typically occurs in flowing areas of large rivers in soft or coarse substrate.	Yes		

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Pondhorn (*Uniomerus tetralasmus*)	Threatened	Not Listed	This species is typically found in ponds, small creeks, and headwater streams with sand or mud substrates.	Yes	This Project must not have an impact on freshwater native mussels at the Project site. If in-stream work is anticipated, follow Ohio Mussel Protocol to assess for listed and non-listed mussels. If no in-water work is planned, no adverse effects to these species are anticipated.	No in water work is planned, so no adverse effects to these species are anticipated. If in-water work is needed, Mussel surveys, per the Ohio Mussel Protocol are recommended, in streams with proposed impacts.
Threehorn wartyback (*Obliquaria reflexa*)	Threatened	Not Listed	Typically found in large rivers with moderate current and stable gravel, sand and mud bottoms.	Yes		
Elktoe (*Alasmidonta marginate*)	Species of Concern	Not Listed	This species is usually found in larger creeks the upper reaches of rivers in mixed sands and gravel substrates.	Yes		
Wavy-rayed lampmussel (*Lampsilis Fasciola*)	Species of Concern	Not Listed	Typically occurs in small-medium sized shallow streams, in and near riffles, with good current. It rarely occurs in medium rivers.	Yes		

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Fish						
Scioto madtom (*Noturus trautmani*)	Endangered	Endangered	prefers stream riffles of moderate current over gravel bottoms. Water must be of high quality and free of suspended sediments.	Yes	ODNR has recommended in-water work restriction dates of March 15th to June 30th in perennial streams. If not in-water work is proposed in perennial streams, the Project is not likely to impact these species.	If in-water work cannot be avoided, recommend working outside of in-water work restriction dates of March 15th through June 30th, in perennial streams.
goldeye (*Hiodon alosoide*s)	Endangered	Not Listed	It prefers turbid slower-moving waters of lakes and rivers.	Yes		
Iowa darter (*Etheostoma exile*)	Endangered	Not Listed	Occurs in clear to lightly turbid water in small cool lakes, bogs, ponds, and in slow-moving waters of small brooks to medium rivers	Yes		
Popeye shiner (*Notropis ariommus*)	Endangered	Not Listed	Primarily inhabits slowly or moderately flowing rivers or creeks.	Yes		
Northern brook lamprey (*Ichthyomyzon fossor*)	Endangered	Not Listed	Typically found in the headwaters of streams that are moderately warm and clean.	Yes		
spotted darter (*Etheostoma maculatum*)	Endangered	Not Listed	Lives in freshwater rivers that are typically marked with the presence of boulders and other rocks.	Yes		
Shortnose gar (*Lepisosteus platostomus*)	Endangered	Not Listed	Primarily found in large rivers and associated overflow ponds and backwaters.	Yes		

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Tonguetied minnow *(Exoglossum laurae)*	Endangered	Not Listed	Lives in clean rock river bottommost, in forested reaches of cool rivers.	Yes	ODNR has recommended in-water work restriction dates of March 15th to June 30th in perennial streams. If not in-water work is proposed in perennial streams, the Project is not likely to impact these species.	If in-water work cannot be avoided, recommend working outside of in-water work restriction dates of March 15th through June 30th, in perennial streams.
Lake chubsucker *(Erimyzon sucetta)*	Threatened	Not Listed	Found in natural lakes and slow-water sections of large streams. These waters are usually clear, vegetated and have sandy or fine graveled bottoms	Yes		
Paddlefish (*Polyodon spathula*)	Threatened	Not Listed	This species is typically found in water deeper than 1.3 m in large river basins and their tributaries.	Yes		
Tippecanoe darter (*Etheostoma tippecanoe*)	Threatened	Not Listed	Most commonly in medium to large streams and rivers.	Yes		
Birds						
American Bittern (*Botaurus lentiginosus*)	Endangered	Not Listed	This species prefers large undisturbed wetlands that have scattered small pools amongst dense vegetation. However, occasionally occupy bogs, large wet meadows, and dense swamps.	No	ODNR has recommended that potential nesting habitat be avoided during the May 1st to July 31st nesting period.	No suitable habitat was observed for these species. No adverse effects to this species or its habitat are anticipated.

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Black-crowned night-heron (*Nycticorax nycticorax*),	Threatened	Not Listed	Wide variety of aquatic habitats, around both fresh and saltwater, including marshes, rivers, ponds, and canals. Nests in groves of trees, in thickets, or on ground, usually on islands or above water, perhaps to avoid predators.	No	ODNR has recommended that potential nesting habitat be avoided during the May 1st to July 31st nesting period.	No suitable habitat was observed for these species. No adverse effects to this species or its habitat are anticipated.
Cattle egret (*Bubulcus ibis*)	Endangered	Not Listed	Widespread in any kind of open country, including pastures, plowed fields, lawns, roadsides. Also, in aquatic habitats, including flooded fields, marshes. Nests in trees or shrubs, in colonies with other wading birds	No	ODNR has recommended that potential nesting habitat be avoided during the May 15th to August 15th nesting period.	No suitable habitat was observed for these species. No adverse effects to this species or its habitat are anticipated.
Lark sparrow (*Chondestes grammacus*)	Endangered	Not Listed	Breed in open grassy habitats with scattered trees and shrubs including orchards, fallow fields, open woodlands, and grasslands.	No	ODNR has recommended that potential nesting habitat be avoided during the May 1st to July 31st nesting period.	
Least bittern (*Ixobrychus exilis*)	Threatened	Not Listed	Often found in freshwater or brackish marshes with tall grasses, cattails, and reeds.	No		

Table 8-5. ODNR and UFSWS Listed Species within the Project Area						
Common Name (*Scientific Name*)	**State Status**	**Federal Status**	**General Habitat Notes**	**Potential Habitat Observed in Study Area**	**Agency Comments**	**Impact Assessment**
Northern Harrier (*Circus hudsonis*)	Endangered	Not Listed	This species is occasionally known to breed in large marshes and grasslands.	No	ODNR has recommended that potential nesting habitat be avoided during the April 15th to July 31st nesting period.	No suitable habitat was observed for these species. No adverse effects to this species or its habitat are anticipated.
Sandhill crane (*Grus canadensis*)	Threatened	Not Listed	Breed and forage in open prairies, grasslands, and wetlands. Outside of the breeding season, they often roost in deeper water of ponds or lakes, where they are safe from predators	No	ODNR has recommended that potential nesting habitat be avoided during the April 15st to August 31st nesting period.	
Upland sandpiper (*Bartramia longicauda*)	Endangered	Not Listed	Nesting habitat is provided in grasslands, pastures, and old-field areas.	No		

(b) Commercial Species

Commercially important species along the proposed routes consist of those hunted or trapped for fur or other products, as listed below:

Beaver (*Castor canadensis*): Beavers occur in forested ponds, lakes, and rivers. In rivers, beavers make burrows with an underwater entrance in the riverbank. However, in streams, lakes, and ponds, beavers usually build dams that incorporate a lodge. Based on habitat present along the routes, beavers may inhabit Big Walnut Creek and Blacklick Creek along the Preferred Route as well as Big Walnut Creek, Blacklick Creek, and Mason Run along the Alternate Route.

Coyote (*Canis latrans*): Historically, coyotes prefer open territory, but in Ohio, they have adapted to various habitat types and habitat fragmentation. Coyotes are a very adaptable species that has prospered despite the expanding presence of human impact. This species is likely found near or within the Project area but was not observed during field investigations.

Gray fox (*Urocyon cinereogentus*): gray foxes prefer wooded areas and partially open brush with little human presence. Based on the habitat present along the routes, this species may occur near or within the Project, within corridors of Big Walnut Creek, Blacklick Creek, and Mason Run. This species was not observed during field investigations; however, they are generally nocturnal animals.

Long-tailed weasel (*Mustela frenata*): the long-tailed weasel is an adaptable animal that can be found in terrestrial habitats near water. Based on habitat present along the routes, this species is likely found near or within the Project, specifically within corridors of Big Walnut Creek, Blacklick Creek, and Mason Run. This species was not observed during field investigations; however, they are generally nocturnal animals.

Mink (*Mustela vison*): Mink are usually found near water, both running and standing. Minks prefer wooded or brush areas. This species likely occurs near or within the Project, in proximity to Big Walnut Creek, Blacklick Creek and Mason Run. Minks were not observed during field investigations.

Muskrat (*Ondatra zibethicus*): The muskrat is a large freshwater rodent known to inhabit wetlands, rivers, and ponds. This species likely occurs near or within the Project but was not observed during field investigations.

Racoon (*Procyon lotor*): The racoon is widespread in Ohio, even in many suburban and urban areas. Racoons prefer wooded areas with water nearby. This nocturnal species was not observed during the field investigations, but likely occurs within the Project.

Red Fox (*Vulpes vulpes*): The red fox inhabits a wide range of habitats in Ohio. This nocturnal species was not observed during field investigations but is likely present throughout the Project area.

River otter (*Lontra canadensis*): River otters live in aquatic habitats such as rivers, lakes, and marshes. They prefer tributaries of large, clean drainages where there is minimal human disturbance. This species may be present in the Project area, in proximity to Big Walnut Creek, Blacklick Creek, or Mason Run. River otters were not observed during field investigations.

Striped Skunk (*Mephitis mephitis*): the skunk is an adaptable animal that occupies both rural and suburban areas. Their dens may be located under buildings, in open fields, on hillsides, or under longs in wooded areas, which may have been self-created or formerly used by other animals. This primarily nocturnal species was not observed during the field investigations but is likely present within the Project.

Virginia opossum (*Didelphis virginiana*): This marsupial's preferred habitat is an area interspersed with woods, wetlands, and farmland; however, they are an adaptable animal that can also be found in urban and suburban areas. This species was not observed during field investigations but is likely present within the Project.

(c) Recreational Species

Recreational terrestrial species consist of those hunted as game. Recreational species expected to inhabit areas within the Project include the following:

(i) Fowl

American crow (*Corvus brachyrhynchos*): The American crow is found in all Ohio counties. They prefer habitats with open fields and trees. American crows were observed during the field investigations along the majority of the Preferred Route and Alternate Route.

American woodcock (*Scolopax minor*): Woodcock prefer open, interspersed, early successional habitats with moist loam soils, which provide earthworms. The largest populations occur in northeast, north central, and central regions of Ohio. This species was not observed during field surveys but may occur within the Project area.

American coot (*Fulica americana*): Coots inhabit the shallows of freshwater lakes, ponds, or marshes. This species may occur within the Project but was not observed during field investigations.

Goose: Several goose species can be found in Ohio, although typically during migration: Snow Goose (*Anser caerulescens*), Greater White-fronted Goose (*Anser albifrons*), Cackling Goose (*Branta hutchinsii*), and Brant (*Branta bernicla*). The Canada Goose (Branta canadensis) is commonly found throughout Ohio, both as residents and migrants. Habitat for Canada Goose was observed along the routes and Canada Goose were the only wild goose species observed during field investigations.

Mourning Dove (*Zenaida macroura*): Mourning Doves are found near rural and suburban residences, nesting in shrubs and trees. They are also frequent in rural farmlands nesting in fencerows and edge habitats. Habitat for this species is present throughout the Project area. This species was observed frequently during field surveys.

Mergansers: Several merganser species can be found in Ohio, such as the Common Merganser (*Mergus merganser*), Red-breasted Merganser (*Mergus serrator*), and Hooded Merganser (*Lophodytes cucullatus*). Habitat for these species is not likely present within the Project area due to the absence of large waterbodies. This species was not observed during field surveys.

Northern Bobwhite Quail (*Colinus virginianus*): The Northern bobwhite quail is a forest edge species. This bird could exist in select locations along the routes; however, it was not observed during field investigations.

Rail: Several rail species can be found in Ohio, such as Yellow rail (*Coturnicops noveboracensis*), black rail (*Laterallus jamaicensis*), king rail (*Rallus elegans*), and Virginia rail (*Rallus limicola*). Rails are found in densely vegetated wetlands and marshes. Suitable habitat for these species is present in select locations within the Project and surrounding area; however, these species were not observed during field surveys.

Ring-necked Pheasant (*Phasianus colchicus*): This species can be found primarily along agricultural edges. Pheasants succeed where farming is intensive if there is adequate undisturbed cover for nesting, and sufficient food and cover during winter. This species may inhabit select locations along the routes; however, no pheasants were observed during field investigations.

Ruffed Grouse (*Bonasa umbellus*): Grouse habitat includes mixed hardwood shrub and forest stands. Although the ruffed grouse was not observed during field surveys, there are limited locations within the Project that contain potentially suitable habitat.

Teal: Several teal species could be found in Ohio including Cinnamon Teal (*Anas cyanoptera*), Green-winged Teal (*Anas crecca*), and Blue-winged Teal (*Anas discors*). They are usually birds of fresh, shallow marshes and rivers instead of large lakes and bays. These species may occur within the larger perennial streams crossed by the Project; however, no teals were observed during field investigations.

Various Duck Species: Various duck species can be found in Ohio, most of which are present only during migration. The American Black Duck (*Anas rubripes*), Redhead (*Aythya americana*), Greater Scaup (*Aythya marila*), Lesser Scaup (*Aythya affinis*), Canvasback (*Aythya valisineria*), and Northern Pintail (*Anas acuta*) are usually only found in Ohio during migration and could be found near the proposed routes at that time. The Mallard (*Anas platyrhynchos*) and Wood Duck (*Aix sponsa*) are two duck species that regularly reside and migrate through Ohio and may occur within the Project area.

- Mallard: Most mallards occupy extensive wetlands; however, they are very adaptable. Mallards can be found inhabiting small farm ponds, ditches with flowing water, streams, lakes, and ponds in urban areas. Suitable habitat for this species is present within the Project area. This species was not observed during field surveys.
- Wood Duck: The Wood Duck prefers mature riparian corridors, quiet backwaters of lakes, ponds bordered by large trees, and secluded wooded swamps. Habitat for this species may be present in limited locations along the routes. This species was not observed during field surveys.

Wild Turkey (*Meleagris gallopavo*): Wild turkeys are adaptable animals. Although they prefer mature forests, they can thrive in areas with as little as 15 percent forest cover. This species was not observed during the field survey.

(ii) Mammals

Eastern cottontail rabbit (*Sylvilagus floridanus*): This species is found in both rural and urban areas. They prefer open areas bordered by thickets or brush areas. While the species was not observed during the field investigations, suitable is present along the Preferred and Alternate Routes.

Gray, red, and fox squirrels (*Sciurus carolinensis*, *Tamiasurius hudsonicus*, and *Sciurus niger*, respectively): The fox squirrel is primarily an inhabitant of isolated woodlots 10 to 20 acres in size with a sparse understory. The eastern gray squirrel prefers more extensive woodland areas. The red squirrel prefers coniferous and mixed forests. Habitat suitable for fox and red squirrels is not present within the Project area. Gray squirrels and their suitable habitat were observed during the field surveys along both the Preferred and Alternate Routes.

Feral Swine (*Sus scrofa*): Feral swine (wild boar) are not native to Ohio, but have established breeding populations in several locations, occupying a wide variety of habitats, including forests, cropland, and shrubland. The greatest concentration of verified populations is generally limited to the unglaciated region of southeastern Ohio. This species was not observed during field investigations and is not likely to occur within the Project or surrounding area.

White-tailed deer (*Odocoileus virginianus*): White-tailed deer are found in rural and suburban areas. Indirect evidence, although no sightings of this species, was observed during the field surveys along both the Preferred and Alternate Routes.

Woodchuck (*Marmota monax*): Woodchucks (also commonly referred to as groundhogs) live in open grasslands, pastures, and woodlands. This species was not observed during field investigations; however, suitable woodland habitat is present in limited areas of the Project.

(iii) Game Fish

Based upon the hydrologic connectivity and the nature of the surface water habitats known to occur within the project area, diverse game fish species are anticipated to inhabit some of the streams that are crossed by the Routes. The ODNR-DOW Sport Fish of Ohio Identification Guide (ODNR-DOW, 2012) was reviewed and narrowed to fish most likely to be found within the project area based on professional judgment and experience, and as such, the list of species presented in this section is not an exhaustive list of all species potentially present in the project area. The listed species are known to be regionally common and likely to occur on a case-by-case basis, within the surface water features proposed to be crossed or encroached. Neither aquatic species nor habitat surveys were completed as part of the field investigations.

Bluegill (*Lepomis macrochirus*): Bluegill are found throughout the state, preferring clear ponds and lakes with rooted vegetation. This species is not likely to occur in streams, PUB wetlands, or ponds identified along the Preferred and Alternate Routes.

Bullhead Catfish (*Ameiurus sp.*): Bullhead catfish are common throughout the state. Brown bullheads prefer clean, clear water, while black bullheads can tolerate more turbid water. Yellow bullheads prefer areas with heavy vegetation. Bullhead catfish are not likely to be found within the Project area.

Common Carp (*Cyprinus carpio*): Carp can be found throughout the state, preferring turbid waters rich in organic matter. The common carp may occur in Big Walnut Creek and Blacklick Creek along the Preferred and Alternate Routes.

Channel Catfish (*Ictalurus punctatus*): Channel catfish are found throughout the state in large streams and lakes. Channel catfish prefer areas with deep water, clean gravel, and boulder substrates with low to moderate current. Suitable habitat for the channel catfish is present along the Preferred and Alternate Routes (Big Walnut Creek and Blacklick Creek).

Flathead Catfish (*Pylodictis olivaris*): Flathead catfish are found in large rivers, a few inland lakes, and some reservoirs that are outside the Project area in Ohio. They prefer deep pools with slow current and cover. Flathead catfish may occur within Big Walnut Creek and Blacklick Creek along the Preferred and Alternate Routes.

Green Sunfish (*Lepomis cyanellus*): Green sunfish are present in most lakes and streams throughout the state and are tolerant of turbid water. They are regularly associated with some type of structure such as brush, vegetation, or rocks. This species is likely to occur in perennial streams along the routes.

Largemouth Bass (*Micropterus salmoides*): Largemouth bass are found in ponds, lakes, and slow sluggish streams throughout the state. This species is likely to occur in the Project (Big Walnut Creek, Blacklick Creek, and Mason Run).

Longear Sunfish (*Lepomis megalotis*): Longear sunfish are found in streams and lakes throughout the state. They prefer sluggish, clear streams of moderate size with beds of aquatic vegetation. This species may occur in streams along the routes.

Redear Sunfish (*Lepomis microlophus*): Redear sunfish are not native to Ohio. They are found primarily in clear, warm waters with vegetation. This species may occur in streams along the routes.

Rock Bass (*Ambloplites rupestris*): Rock bass are widespread throughout the state. They prefer clear streams with coarse gravel and boulders. This species is likely to be found in streams along the Preferred and Alternate Routes.

Smallmouth Bass (*Micropterus dolomieu*): Smallmouth bass are often abundant in quarries and thrive in streams with gravel or rock bottoms with a visible current. This species is likely to occur in streams along the Preferred and Alternate Routes.

Spotted Bass (*Micropterus punctulatus*): Spotted bass occur in low gradient streams in southern Ohio. Spotted bass are likely to be found in the Project area.

(2) Construction Impact

Based on the nature of the proposed Project activities, habitat characteristics of the surrounding vicinity, and mobility of various species, construction impacts to protected, commercial, or recreational species are not anticipated. The Company will coordinate with USFWS and ODNR regarding specific construction requirements, if required by these agencies. While portions of the transmission line corridor may need to be cleared for construction, the undeveloped land not disturbed by construction will retain its current vegetation composition and provide mobile species with available habitat in the surrounding area.

To avoid direct impacts to Indiana bat and northern long-eared roosting and foraging habitat, USFWS recommends that the removal of any trees greater than three inches diameter at breast height (dbh) only occur between October 1 and March 31 if no caves or abandoned mines are present and tree removal is unavoidable. Following this seasonal tree clearing recommendation should ensure that any effects to Indiana bats and northern long-eared bats are insignificant or discountable. The Company proposes to limit potential Indiana bat and northern long-eared bat habitat tree removal activities to those times outside of the summer roosting months for these species.

The Company proposes no in-water work for perennial streams between April 15 and June 30 to eliminate impacts to indigenous and protected aquatic species and their habitat. In-water work is not anticipated in a waterbody that would require a mussel survey for the federal and state listed mussel species; therefore, no impacts to these species are anticipated to occur as a result of the Project.

(3) Operation and Maintenance Impact

During the operation of the transmission line along the Preferred or Alternate Routes, any impacts on protected wildlife that may be present are anticipated to be minimal. While portions of the transmission line corridors will need to be cleared, the undeveloped land not disturbed by construction will retain its current vegetation composition. Periodic maintenance along the

transmission line corridors is not expected to result in a significant impact to the local wildlife. Operational activities and periodic maintenance of the ROW are not anticipated to impact wildlife significantly due to the minimal permanent ground disturbance and available adjacent habitat available.

(4) Mitigation Procedures

The Preferred and Alternate Routes have been examined in the field and reviewed on aerial photographs by experienced biologists and environmental scientists. No significant problem areas that would require the use of the special mitigation measures for protected wildlife have been identified. If, however, such conditions are recognized at a later date, the condition will be mitigated appropriately on an individual basis through additional consultation with the applicable resource agencies.

(D) SITE GEOLOGY

(1) Local Geology

Both routes fall within the Columbus Lowland section of the Till Plains physiographic region (ODNR, 1998). Distinguishing characteristics of the Columbus Lowland section include lowland surrounded in all directions by relative uplands, having a broad regional slope toward the Scioto Valley with many larger streams, and elevation ranging from 100 to 850 feet. Both routes and their 1,000-foot buffer areas are located completely within the Ohio Shale formation. Bedrock geology beneath both routes consists primarily of Upper Devonian age shale, siltstone, and very fine-grained sandstone (Horton, 2017).

(2) Slopes and Soil Suitability for Foundation Construction

Slopes exceeding 12 percent, obtained from the Ohio Statewide Imagery Program (OSIP) and Ohio Geographically Referenced Information Program (OGRIP) dataset, are provided on **Figures 8-1A** through **8-1J**. Approximately 1.5 miles of the Preferred and approximately 0.9 miles of the Alternate Routes cross areas mapped with slopes greater than 12 percent. In general, transmission line poles will be placed on ridge tops to allow spanning of stream valleys and reduce the possibility that the line will interfere with vegetation where terrain is challenging. Poles will be placed on stable ridge tops rather than more unstable steep slopes. Slope and soil mechanics will

be carefully considered in the decision-making process where access roads must be improved or constructed. In these areas, soils with the lowest slope and erosion characteristics will be used to construct access roads to the transmission pole locations.

The bedrock geologies consisting primarily of shale, siltstones, and sandstone, with overlaying soils consisting of primarily silt loams and silty clay loams, present along both routes, are generally expected to be suitable for foundation construction. Soil associations that will be crossed by the Preferred and Alternate Routes are shown on **Figures 8-1A** through **8-1J.**

During construction, The Company will implement a SWPPP and associated BMPs as necessary to control erosion and sedimentation in areas with slopes exceeding 12 percent. Once construction is complete, soils will be revegetated and stabilized. As a result, no erosional impacts resulting from slopes exceeding 12 percent are expected.

To obtain further site-specific details on the suitability of the soils for foundation construction, The Company will conduct detailed engineering design and geotechnical soil borings. Engineering design and geotechnical test drilling will likely be completed soon after the Project is certificated by OPSB and engineering plans and boring logs will be provided to the staff shortly thereafter.

At a minimum, geotechnical soil boring will provide the following information to be utilized for structure placement and foundation design engineering, as needed:

- Subsurface Soil Properties
- Static Water Level
- Rock Quality Description
- Percent Recovery
- Depth and Description of Bedrock Contact

The Company anticipates that foundations will only be required at some angle structures that will be ultimately determined during the engineering design. When required, foundations will be engineered based on the results of geotechnical soil boring and laboratory test results to ensure they are sited in locations considered suitable based on soil and rock properties and surface slope.

Once the transmission line is in place, disturbed areas will be stabilized and re-vegetated. No impacts or erosion hazards are expected. Maintenance activities that involve excavation around poles are anticipated to be extremely rare, but in these cases, standard measures will be implemented to prevent soil erosion and run off into any nearby streams and wetlands.

No special mitigation procedures are anticipated beyond standard erosion prevention measures which take place during any construction activity. BMPs consisting mainly of silt fences and filter socks will be used when construction takes place adjacent to drainage channels, streams, and wetlands. A SWPPP will be generated for the certificated route and the requirements of Ohio EPA Permit No. OHC000004 (general construction stormwater permit) will be followed and met for erosion and sedimentation control.

(E) ENVIRONMENTAL AND AVIATION COMPLIANCE INFORMATION

(1) List and Discussion of Permits Required

The Applicant anticipates submitting a Notice of Intent ("NOI") for coverage under the Ohio EPA General National Pollutant Discharge Elimination System ("NPDES") Permit, and a floodplain permit associated with construction activity. Coverage under the USACE's Nationwide Permit Program may also be required depending on final structure placement and access road locations.

(2) Description, Quantification, Characterization, Removal, and Disposal of Construction Debris

As construction work proceeds, the site will be kept clean of rubbish and debris resulting from the work. Debris associated with construction of the proposed transmission line is expected to consist of conductor scrap, construction material packaging including cartons, insulator crates, conductor reels and wrapping, and used stormwater erosion control materials. Clearance poles, conductor reels and other materials with salvage value will be removed from the construction area for reuse or salvage. Construction debris will be disposed of in accordance with state and federal requirements in an Ohio EPA approved landfill or other appropriately licensed and operated facility. Where vegetation must be cleared, the resulting brush will be removed or windrowed along the edge of the ROW or as requested by individual property owners. Marketable timber will generally be cut into appropriate lengths for sale or disposition by the landowner.

(3) Storm Water and Erosion Controls during Construction and Restoration of Soils, Wetlands, and Streams Disturbed as a Result of Construction of the Facility

A SWPPP will be prepared, BMPs implemented to minimize soil erosion and sedimentation and other pollutant discharges, and these will be made available onsite during Project construction. The SWPPP will include the following General Conditions, at a minimum:

Erosion and Sediment Controls

Implementation of erosion and sediment control practices will be based on the methods and standards described in the ODNR Rainwater and Land Development Manual (ODNR, 2014); and the OEPA NPDES Permit Program for the discharge of stormwater from construction sites, and any erosion and sediment control practices and standards required by Franklin County.

Wetlands, streams and other environmentally sensitive areas shall be clearly marked before the start clearing or construction. No construction or access will be permitted in these areas unless clearly specified in the SWPPP.

No permanent impacts to streams or headwaters are anticipated. No poles are anticipated to be located in streams and no permanent stream crossings are anticipated. Streams, including beds and banks, if disturbed during construction, will be re-stabilized immediately after in-channel work is completed.

Grubbing activities are not expected to be required. Sediment basins, traps and perimeter sediment controls will be implemented within seven days of any grubbing activities and shall continue to function until disturbed areas are permanently stabilized.

Silt Fence: Silt fencing and/or other appropriate BMPs for erosion control will be installed as needed before ground-disturbing work begins. Silt fence will be installed according to the methods recommended in the Rainwater and Land Development Manual (ODNR, 2014) before upslope land disturbance begins. In general, silt fence will be used where there is the possibility that sheet flow will carry sediment-laden water into downstream creeks or wetlands. Other methods will be used where flow in ditches, channels, or gullies is anticipated. The following installation guidelines will be followed:

- Silt fence will be installed before upslope land disturbance begins;
- All silt fence will be placed as close to the contour as possible so that water will not concentrate at low points in the fence and so that small swales or depressions that may carry small concentrated flows to the silt fence are dissipated along its length;
- Ends of the silt fence will be brought upslope slightly so that water ponded by the silt fence will be prevented from flowing around the ends;
- Silt fence will be placed on the flattest area available;
- Where possible, vegetation will be preserved for five feet (or as much as possible) upslope from the silt fence. If vegetation is removed, it will be reestablished within seven days from the installation of the silt fence;
- The height of the silt fence will be a minimum of 16 inches above the original ground surface;
- The silt fence will be placed in an excavated or sliced trench cut a minimum of six inches deep. The trench will be made with trencher, cable laying machine, slicing machine, or other suitable device that will ensure an adequately uniform trench depth;
- The silt fence will be placed with the stakes on the downslope side of the geotextile. A minimum of eight inches of geotextile will be below the ground surface. Excess material will lay on the bottom of the 6-inch deep trench. The trench will be backfilled and compacted on both sides of the fabric; and,
- Seams between sections of silt fence will be spliced together only at a support post with a minimum 6-inch overlap prior to driving into the ground.

Soil Stabilization: Disturbed areas that remain unworked for more than 21 days will be stabilized with seed and mulch no longer than 14 days after the last construction in those areas.

Maintenance and Inspection: Erosion and sediment control practices will be inspected at least once every seven days and within 24 hours after any storm event greater than 0.5-inch of rain per 24-hour period.

The Company will maintain erosion control measures in good working order. If a repair is necessary, it will be initiated within 24 hours of report. Silt fencing will be inspected for depth of sediment, for tears, for assurance fabric is securely attached to the fence posts, and to ensure that

the fence posts are firmly in the ground. Seeded areas will be inspected for evidence of bare spots or washouts. Permanent records of the maintenance and inspection will be maintained throughout the construction period. Records will include, at a minimum, the name of the inspector, major observations, date of inspection, certification of compliance, and corrective measured taken.

(4) Disposition of Contaminated Soil and Hazardous Materials

All materials stored on-site will be kept in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure. Products will be kept in their original containers with the original manufacturer's label. Manufacturer's recommendations for proper use and disposal will be followed. Material Safety Data Sheets (or Safety Data Sheets "SDS") will be retained and available on-site at all times.

Spill Prevention

The following spill prevention methods and procedures are proposed:

- All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in clearly labeled and tightly sealed containers.
- Secondary containment will be provided for all on-site fuel storage tanks.
- All sanitary waste will be collected in portable units and emptied regularly by a licensed sanitary waste management contractor, as required by local regulations.
- All spills will be cleaned up immediately after discovery. Manufacturer's recommended methods for spill cleanup will be followed. Materials and equipment necessary for spill cleanup will be kept in a designated storage area on-site.
- Spills will be reported to the appropriate government agency as required.
- Any suspected hazardous materials encountered during construction will be reported to the AEP Ohio Transco Regional Environmental Coordinator by the AEP Ohio Transco Construction Representative. In addition, the AEP Ohio Transco Project Manager will be notified, as well as the required levels of AEP Ohio Transco Management.

The Company requires a Spill Prevention Plan to be created and available for review on-site for construction Projects of this scope by its contractors. This Spill Prevention Plan will cover proper

handling techniques for all electrical equipment, materials and construction equipment that require a SDS. The Company also requires its employees and contractors to follow all Federal and State mandated material handling requirements.

The Company follows an internal Spill Prevention Notification Plan that is closely aligned to the AEP Ohio Transco Spill Response and Cleanup – Field Guide. This Spill Response and Cleanup – Field Guide covers the following procedures:

- Oil/PCB Spill Response and Cleanup Procedure
- When to Report an Oil/PCB Spill to the Regional Environmental Coordinator
- Hazardous Substance Spill Response Procedure
- Regional Environmental Coordinator Contact List

This Field Guide outlines spill response and cleanup procedures as well as the reporting that is required. This Spill Response and Cleanup – Field Guide will be available upon request.

(5) Maximum Height of Above Ground Structures

The height of the tallest anticipated above ground structure or construction equipment is designed to be approximately 86 feet to 100 feet. The nearest FAA facility is a privately owned and unnamed helipad, located approximately one mile north of the Project. Current aerial imagery depicts the helipad as a commercial parking lot.

The Federal Aviation Administration (FAA) Form 7460-1, "Notice of Proposed Construction or Alteration," is used for FAA notification. This can be filed electronically or by standard U.S. mail. A 7.5-minute quadrangle topographic map showing the proposed construction must be attached to the completed Form 7460-1. The Form 7460-1 must be submitted 45 days prior to the proposed start of construction.

Additionally, a permit from ODOT, Office of Aviation, must be obtained prior to the start of any construction on or near airports in Ohio that are open to the public. A duplicate of the federal filing fulfills the state permit application requirements as set for in O.A.C. 5501:1-10-06.

(a) Filing Criteria

The FAA Form 7460-1 must be filed for any construction or alteration of more than 200 feet in height. Additionally, any construction or alteration extending outward and upward in excess of specific slope angles in reference to aircraft take-off or landings on airport runways may require filing with the FAA:

Upon completion of the final design, the Company will review the need for any permitting with the FAA and will follow recommendations made by the FAA.

(6) Construction during Excessively Dusty or Excessively Muddy Soil Conditions

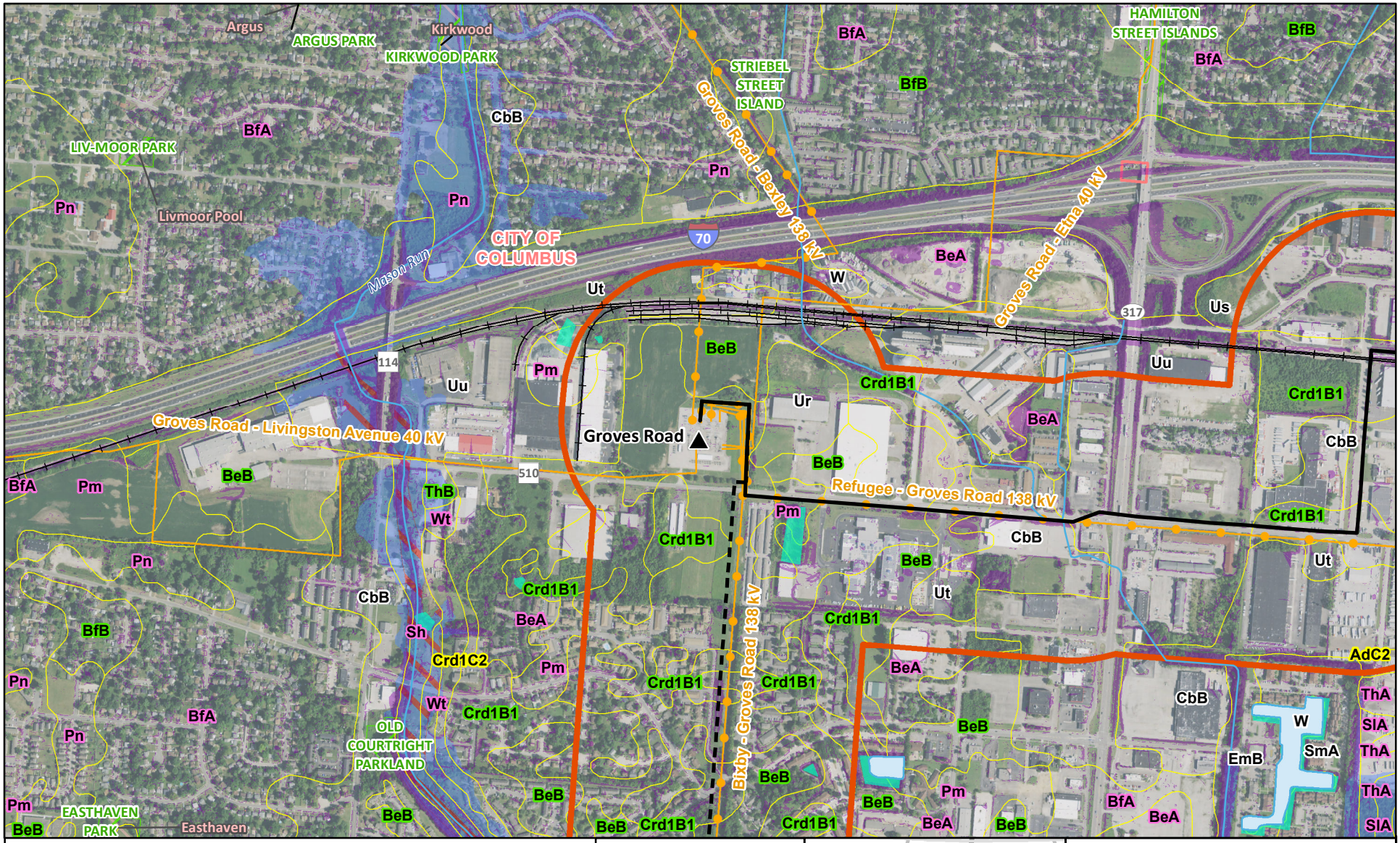
(a) Dust Control

The Project construction areas and immediate vicinity will be kept free from dust nuisance resulting from Project activities. During excessively dry periods of active construction, dust suppression will be implemented where necessary through irrigation, mulching, or application of tackifier resins.

(b) Excessive Muddy Soil Conditions

Construction entrances will be established and maintained to a condition which will prevent tracking or flowing of sediment onto public rights of way. All sediment spilled, dropped, washed, or tracked onto public rights-of-way will be removed immediately.

FIGURES



Existing Station
Railroad
Preferred Route
Alternate Route
Railroad
NHD Stream or River

1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%

City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type
Local Government

FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

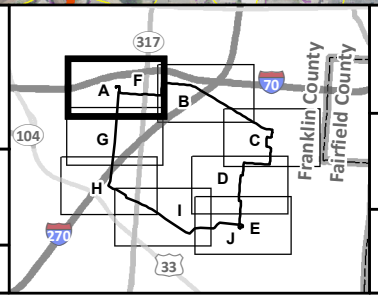
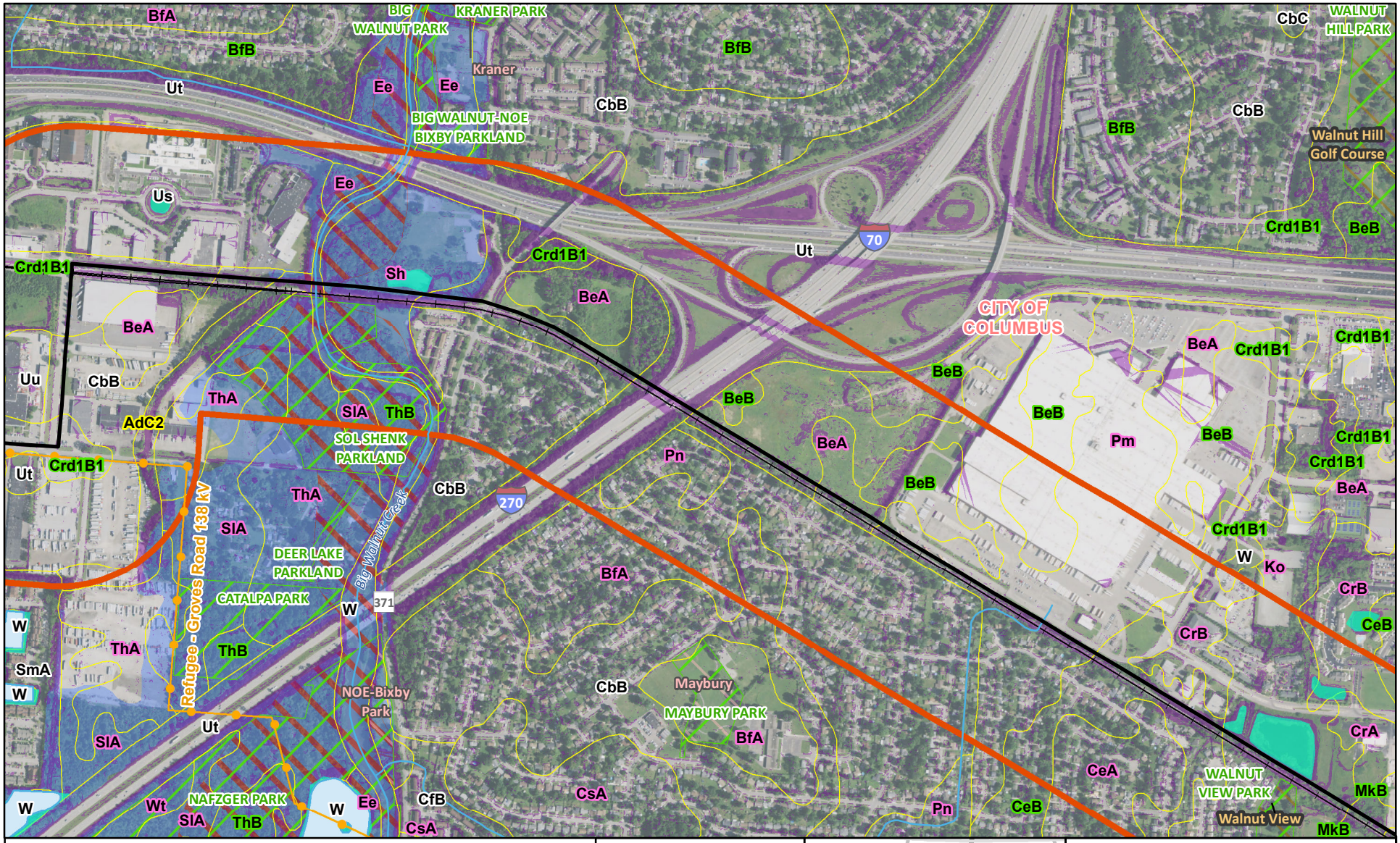


Figure 8-1A
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Railroad
Preferred Route
Railroad
NHD Stream or River
1,000 Foot Buffer

NHD Waterbody
NWI Wetland
Slopes >= 12%

City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

Local Government

Private Land
FEMA 100-Year Floodplain
FEMA Regulatory Floodway

Township Boundary
Municipal Boundary

Soil Map Unit

Erosion Hazard

Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

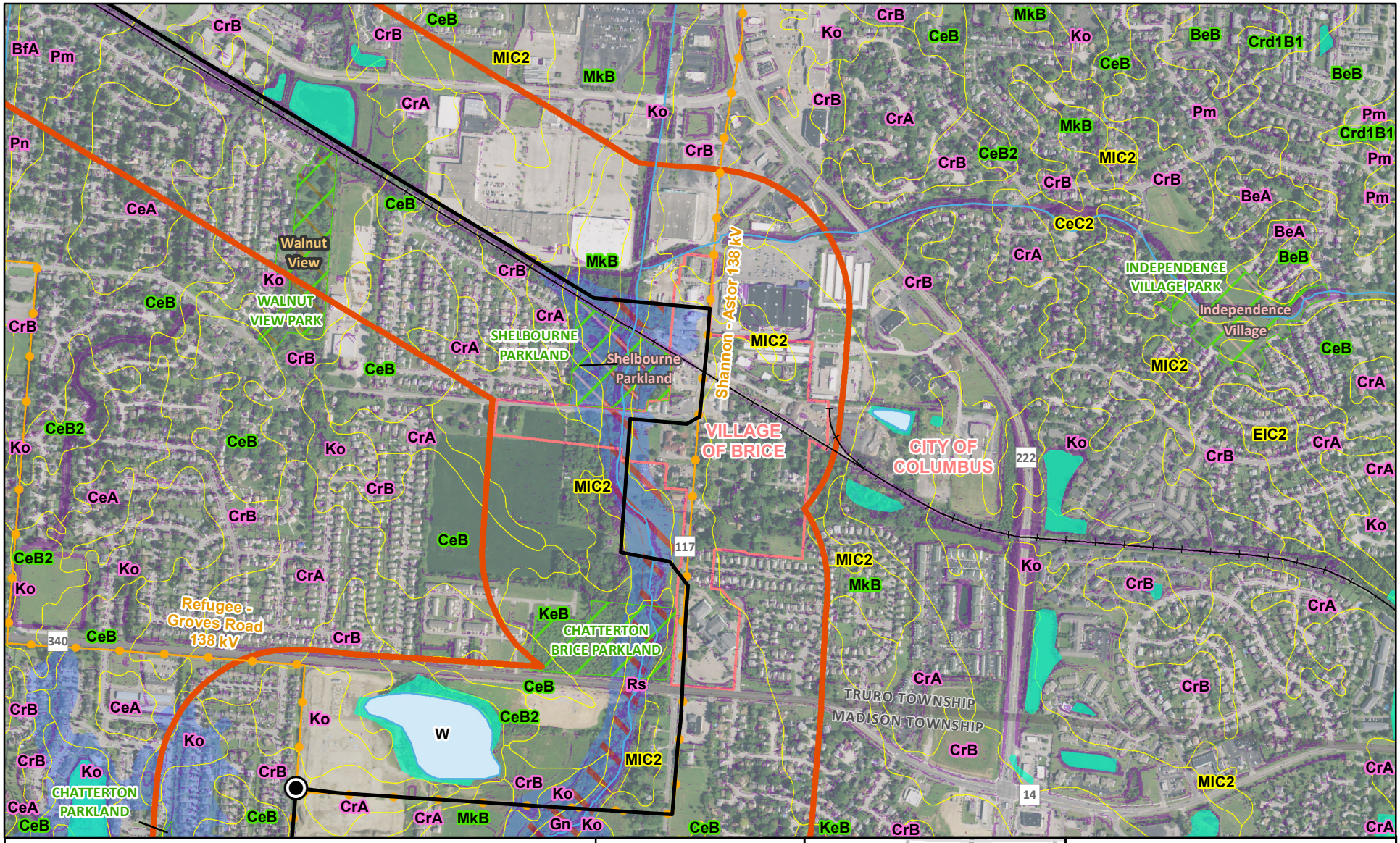
March 03, 2022

Figure 8-1B
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Refugee Switch (to be removed)
Railroad
Preferred Route
Railroad
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%
City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

Local Government
Private Land
FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit

Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

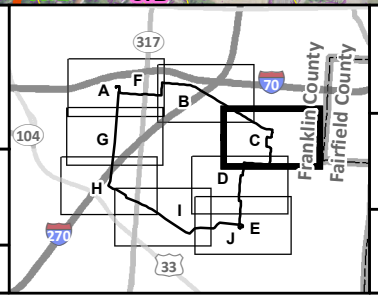
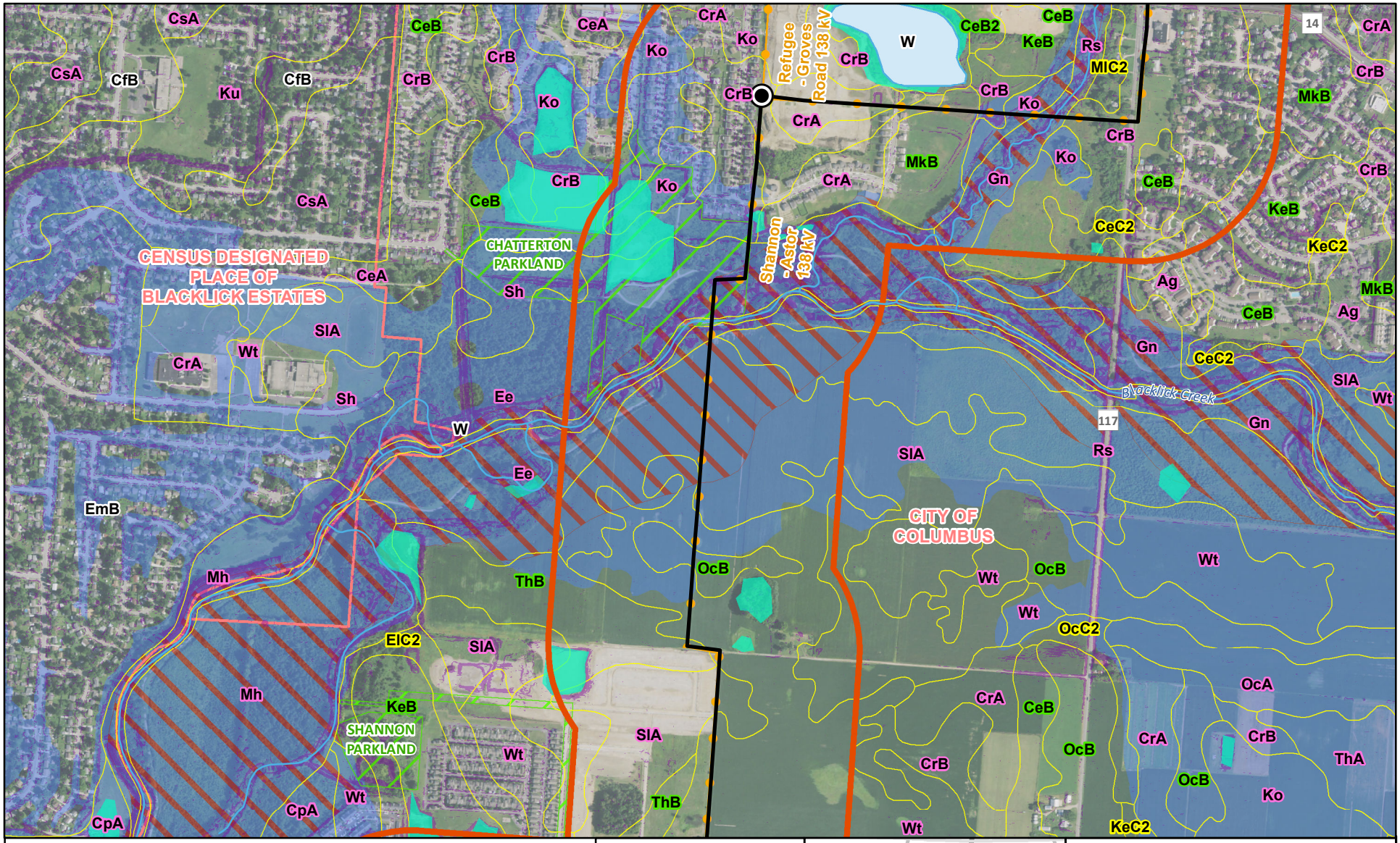


Figure 8-1C
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Refugee Switch (to be removed)
Preferred Route
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%
City of Columbus Park or Easement Boundary
FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

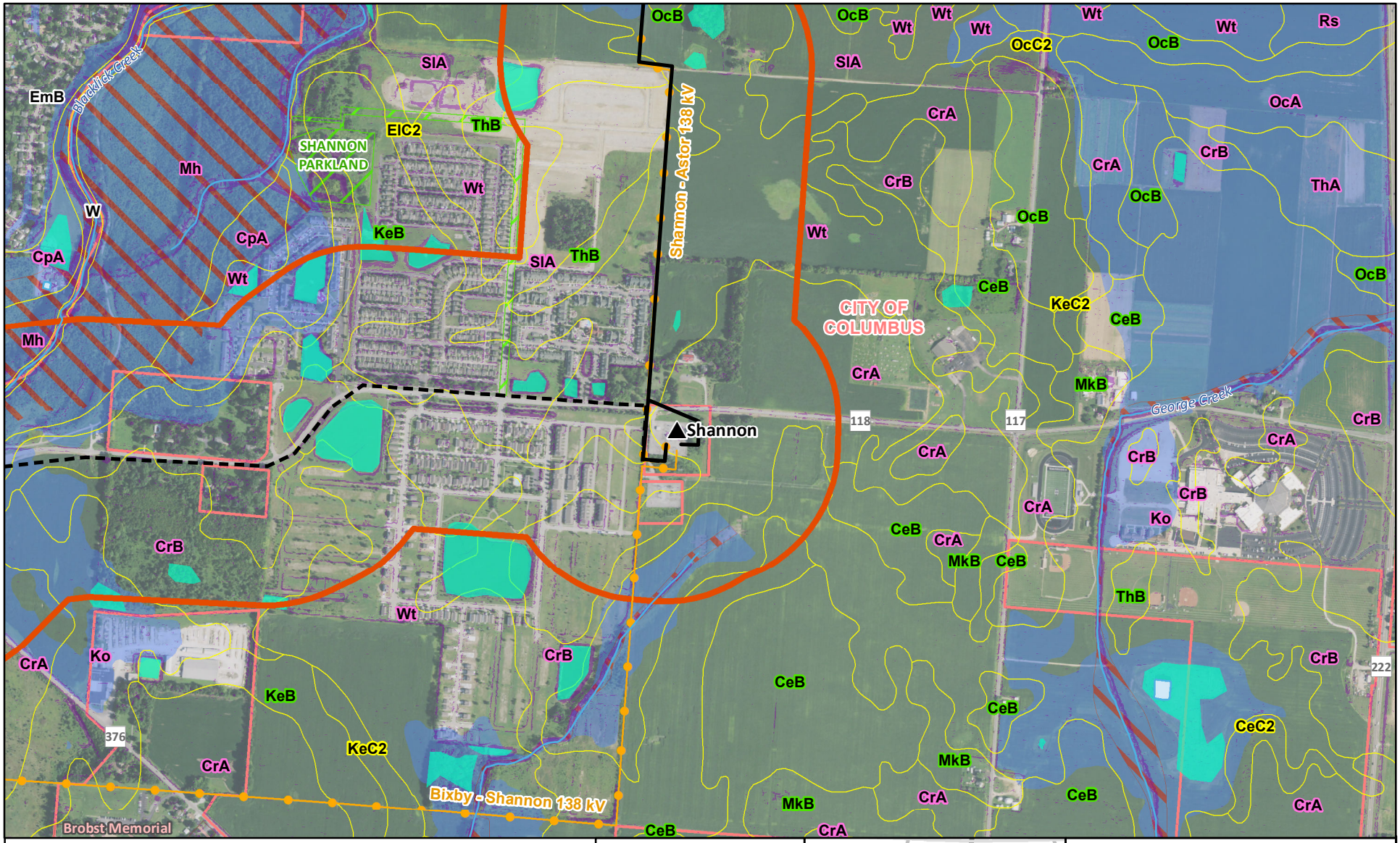
March 03, 2022

Figure 8-1D
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Existing Station
Preferred Route
Alternate Route
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%
City of Columbus Park or Easement Boundary
Protected Areas - Ownership Type
Local Government
FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

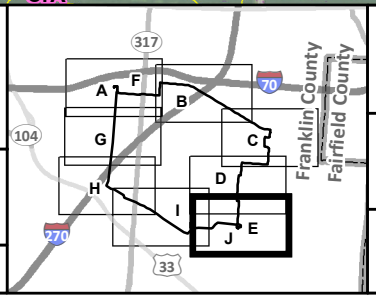
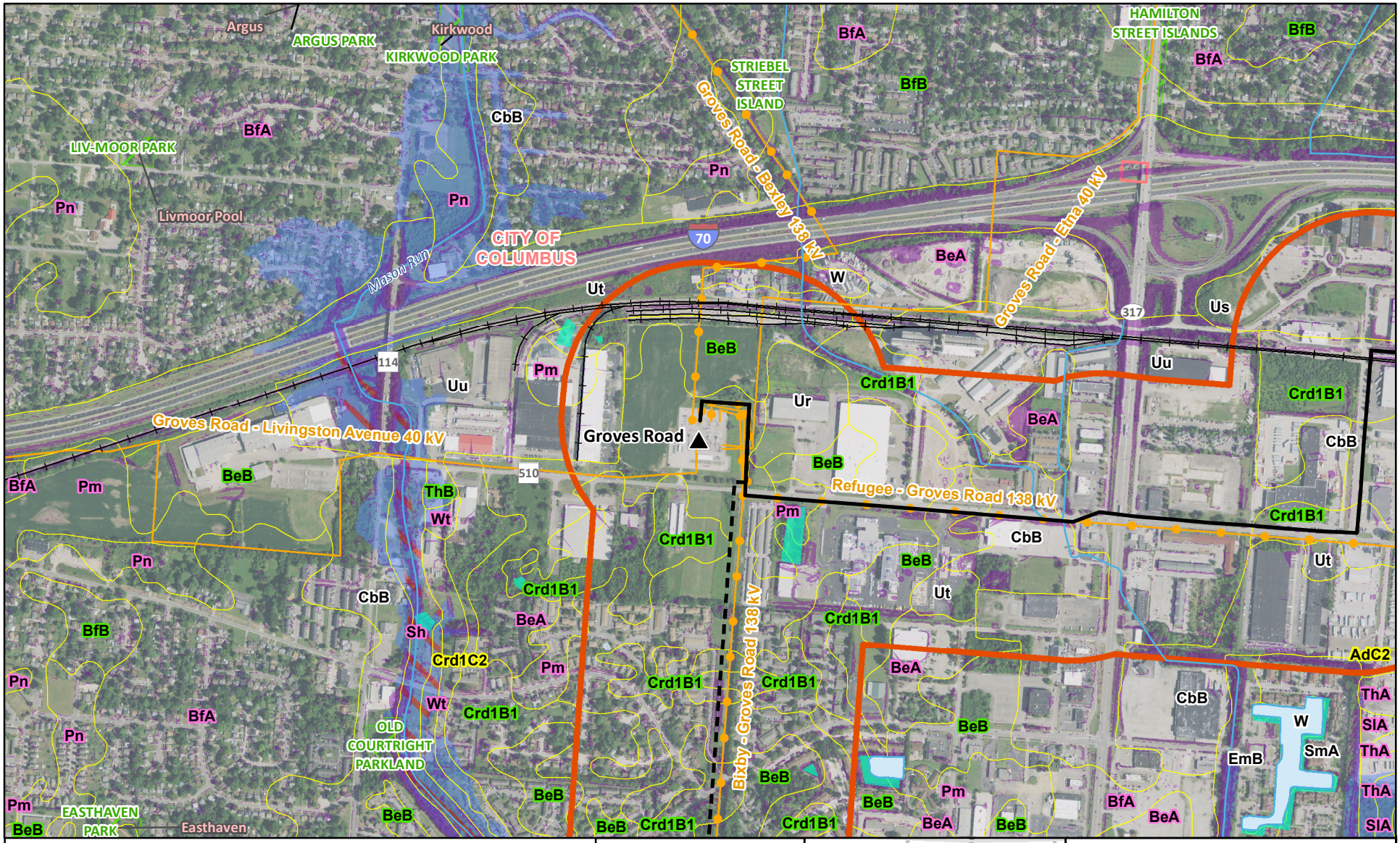


Figure 8-1E
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Existing Station
Railroad
Preferred Route
Alternate Route
Railroad
NHD Stream or River

1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%

City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type
Local Government

FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

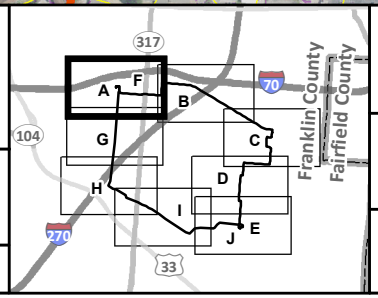
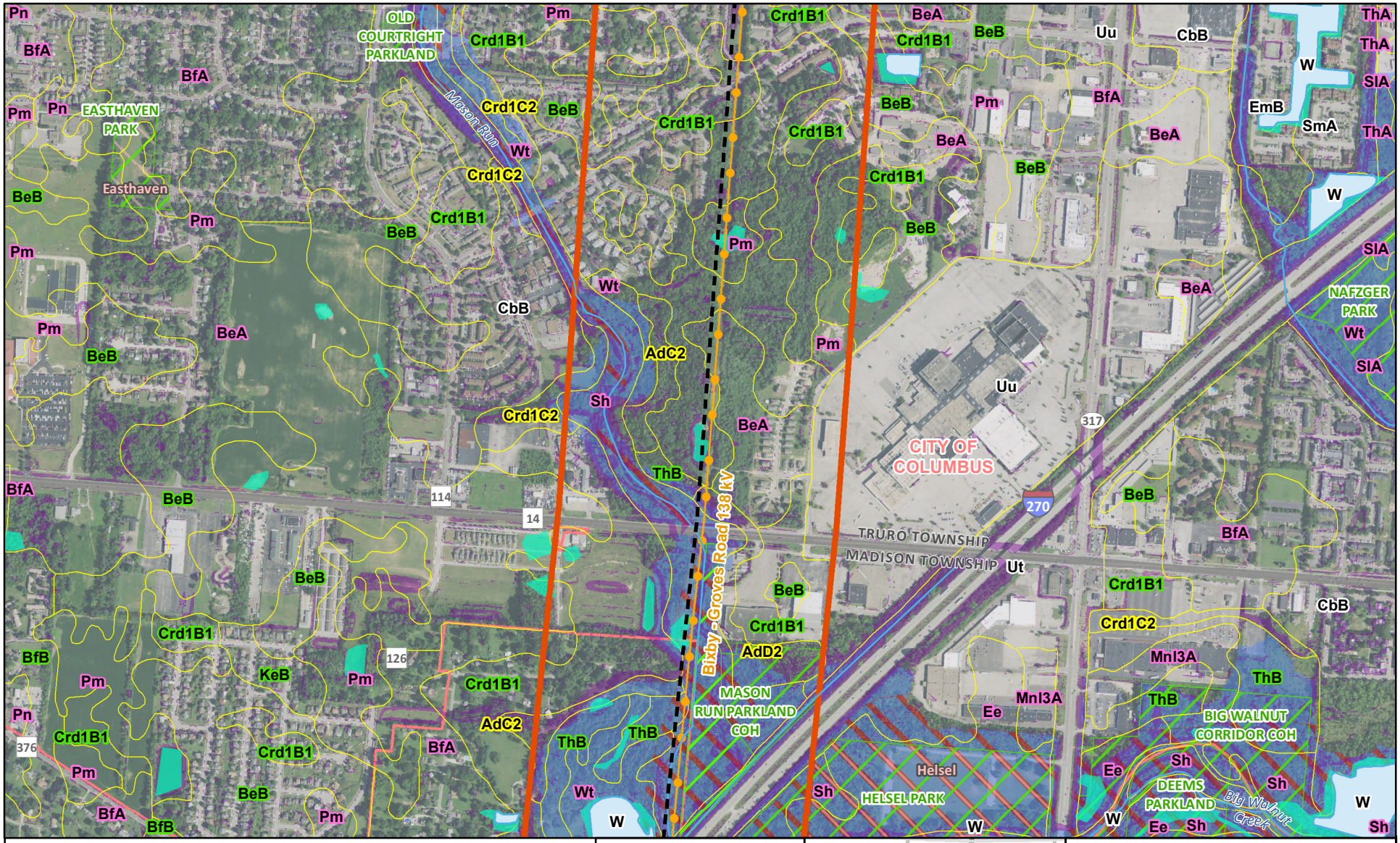


Figure 8-1F
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



- Alternate Route
- NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- NWI Wetland
- Slopes >= 12%
- City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type

- Local Government
- FEMA 100-Year Floodplain
- FEMA Regulatory Floodway
- Township Boundary
- Municipal Boundary

Soil Map Unit

Erosion Hazard

- Ab Moderate
- Ab Not rated
- Ab Severe
- Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

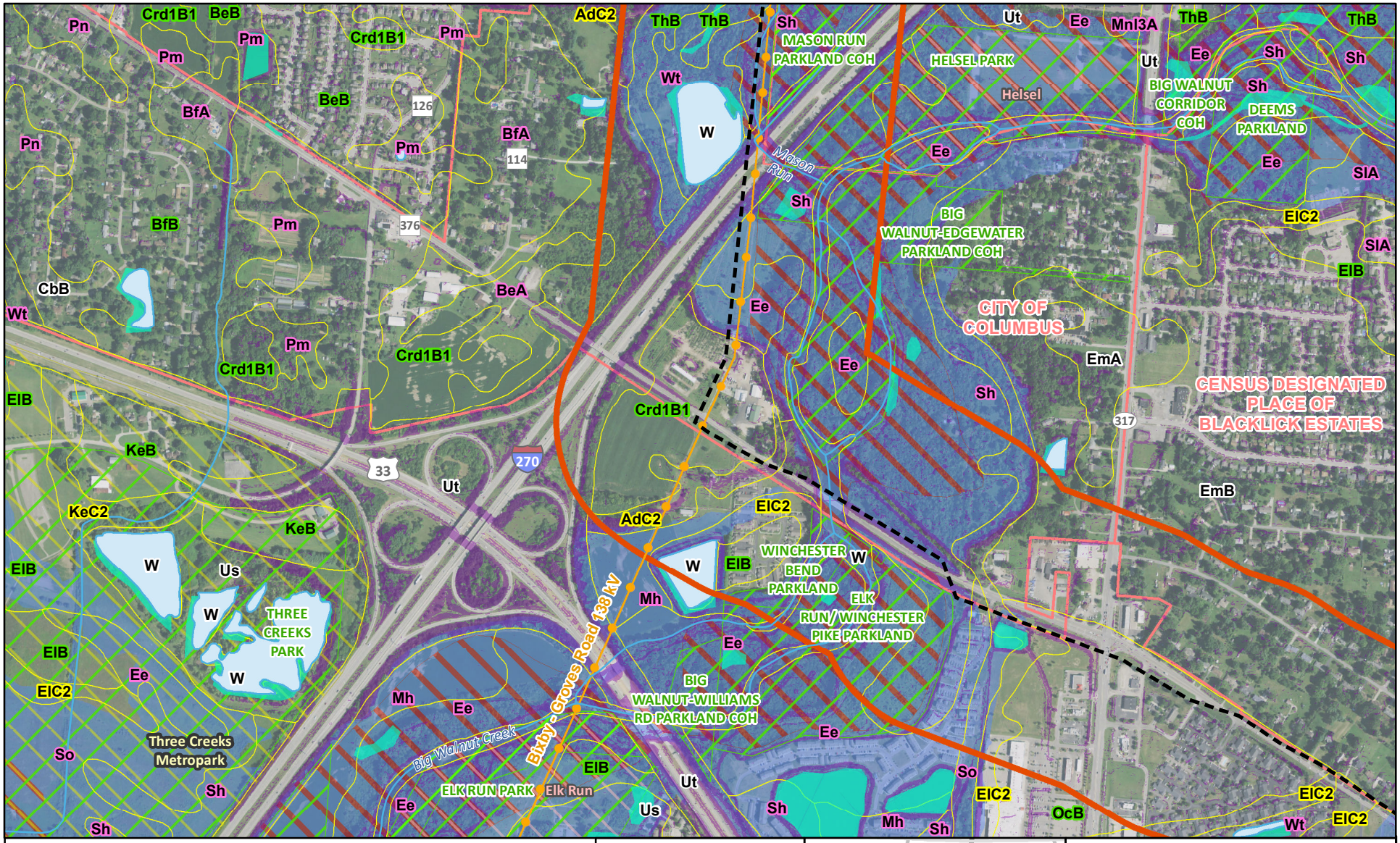
March 03, 2022

Figure 8-1G
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Alternate Route
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%
City of Columbus Park or Easement Boundary

Protected Areas - Ownership Type
Local Government
Regional Agency Special District

FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

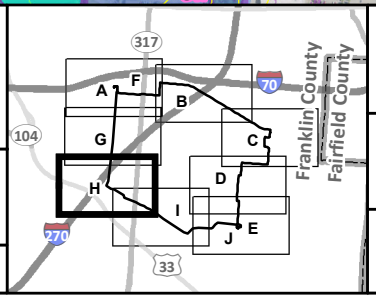


Figure 8-1H
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



- Alternate Route
- NHD Stream or River
- 1,000 Foot Buffer
- NHD Waterbody
- NWI Wetland
- Slopes >= 12%
- City of Columbus Park or Easement Boundary
- FEMA 100-Year Floodplain
- FEMA Regulatory Floodway
- Township Boundary
- Municipal Boundary

Soil Map Unit
Erosion Hazard
- Ab Moderate
- Ab Not rated
- Ab Severe
- Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

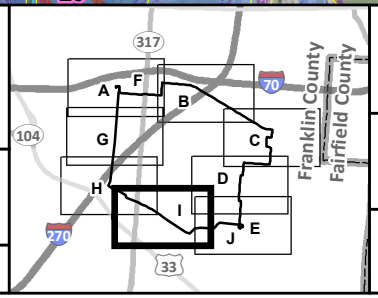
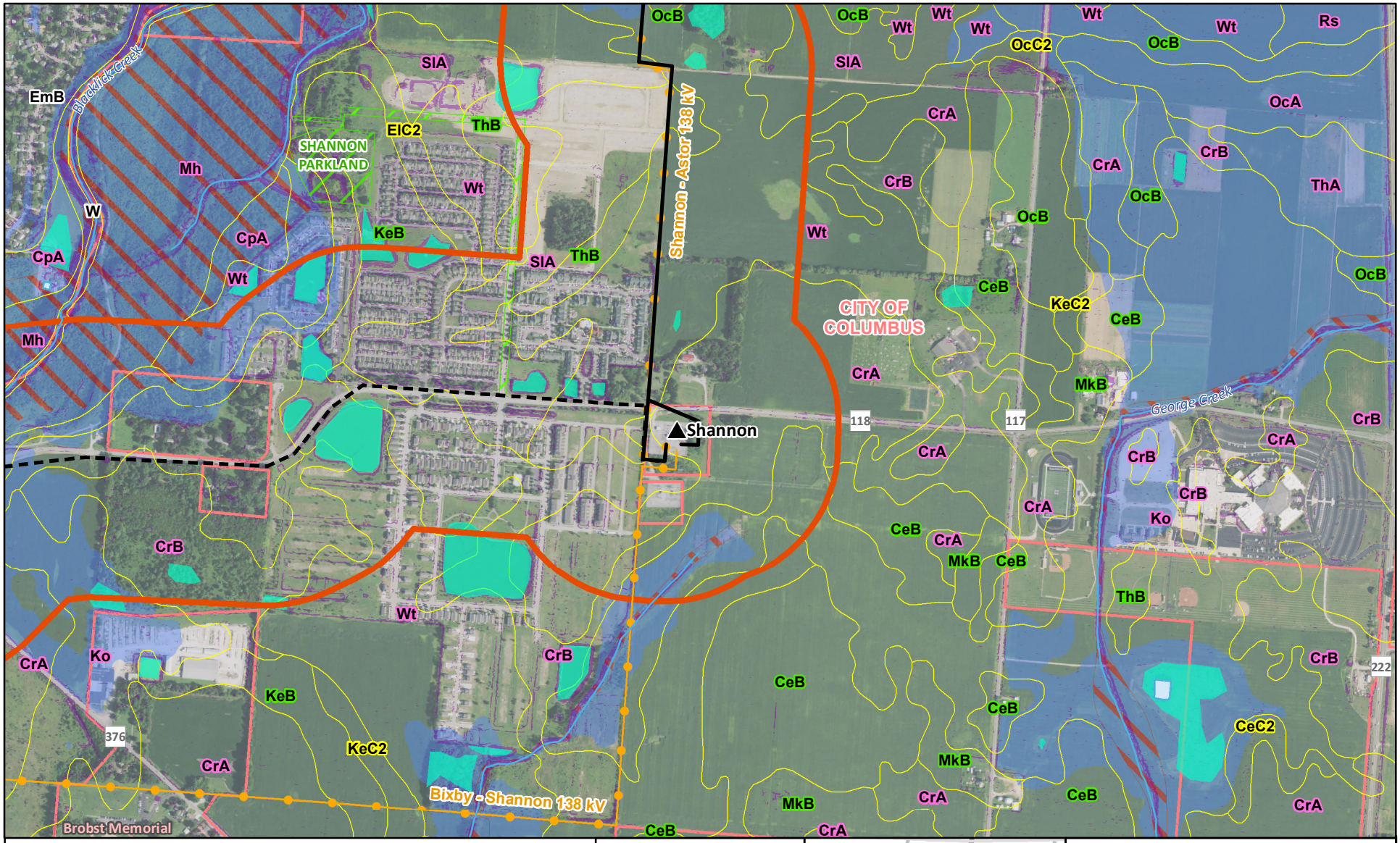


Figure 8-1l
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Existing Station
Preferred Route
Alternate Route
NHD Stream or River
1,000 Foot Buffer
NHD Waterbody
NWI Wetland
Slopes >= 12%
City of Columbus Park or Easement Boundary
Protected Areas - Ownership Type
Local Government
FEMA 100-Year Floodplain
FEMA Regulatory Floodway
Township Boundary
Municipal Boundary

Soil Map Unit
Erosion Hazard
Ab Moderate
Ab Not rated
Ab Severe
Ab Slight

Data Sources:
AEP (2017), ESRI (2021), FEMA (2018), ODOT (2021), NAIP (2019), NRCS (2019), USFWS (2020), USGS (2021)

State Plane Ohio South
NAD 83

March 03, 2022

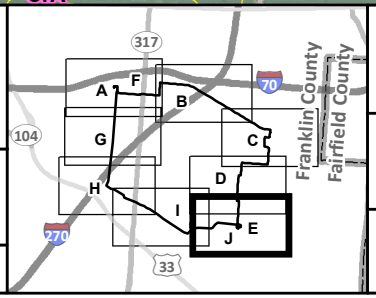
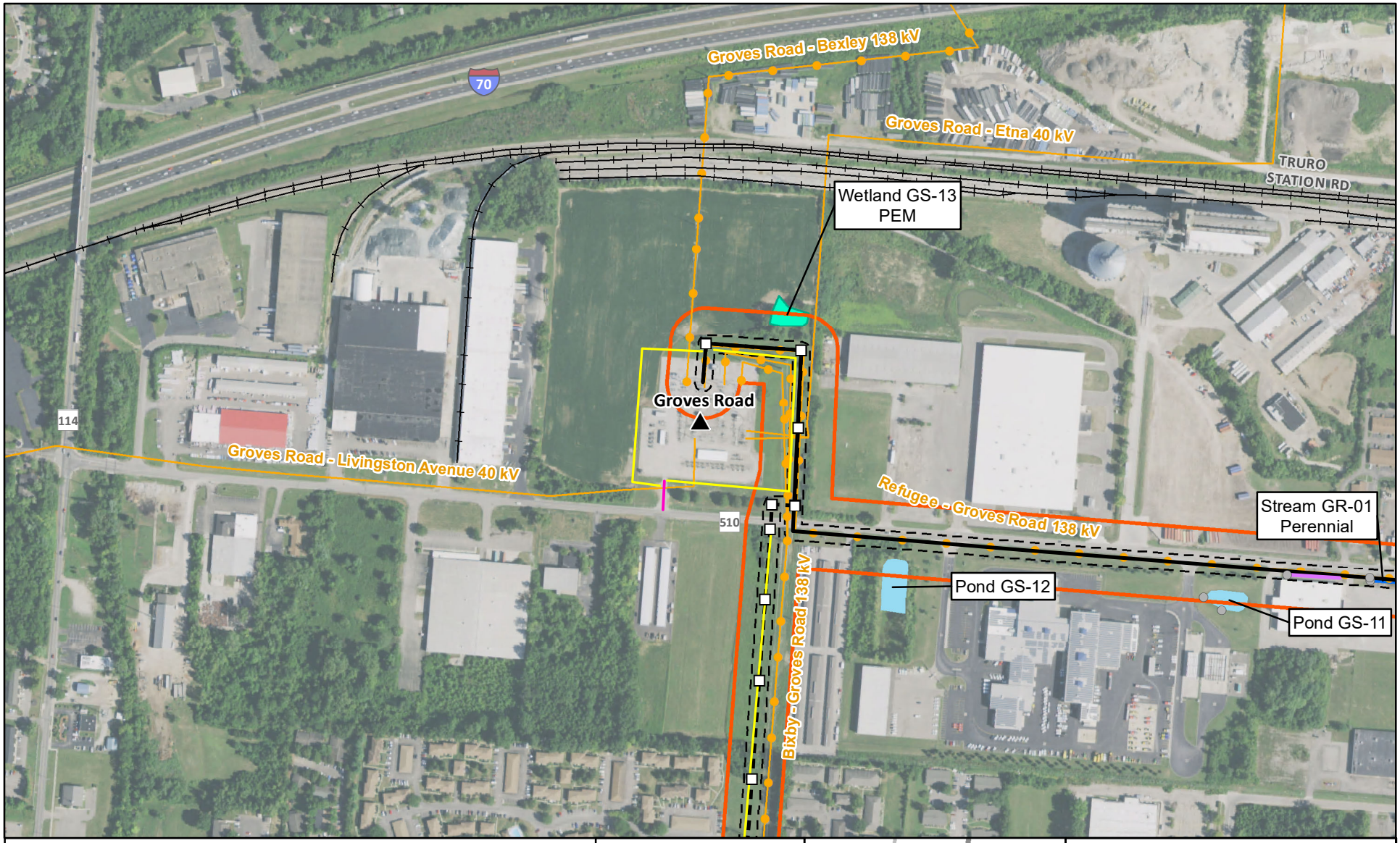


Figure 8-1J
Ecological Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 1,000 2,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

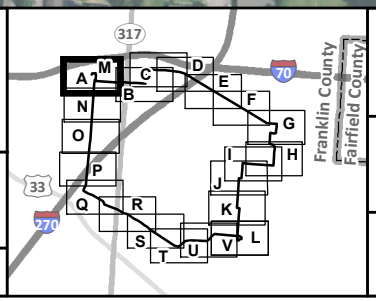
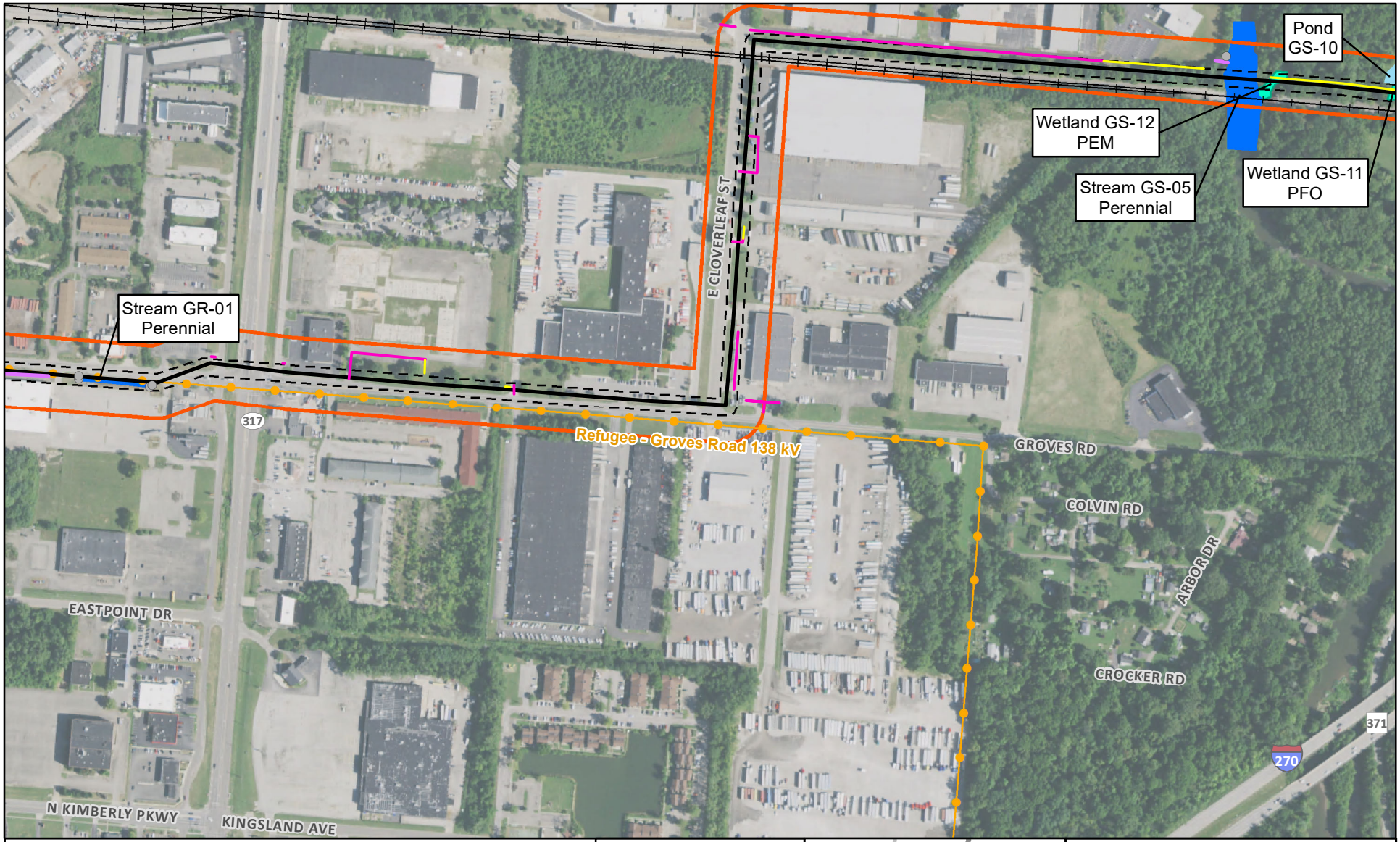


Figure 8-2A
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

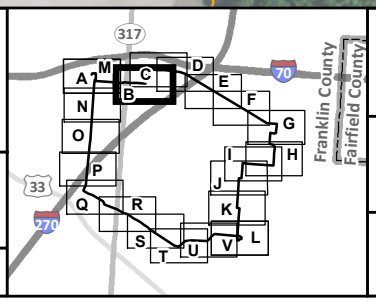
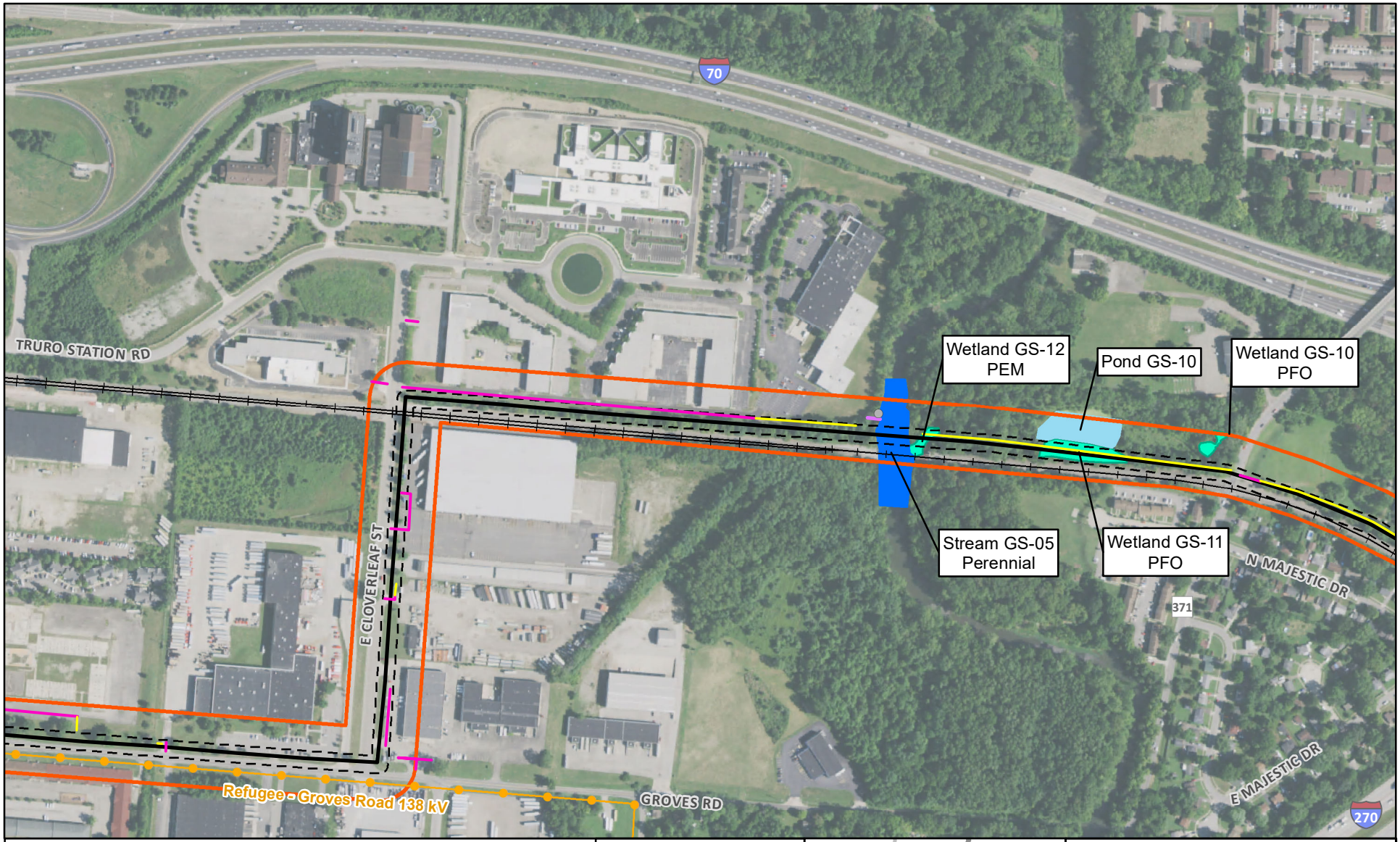


Figure 8-2B
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

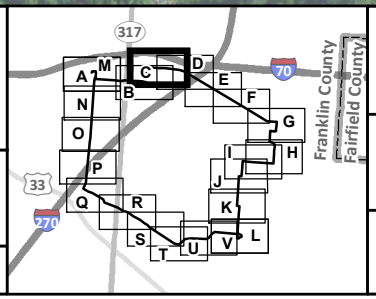
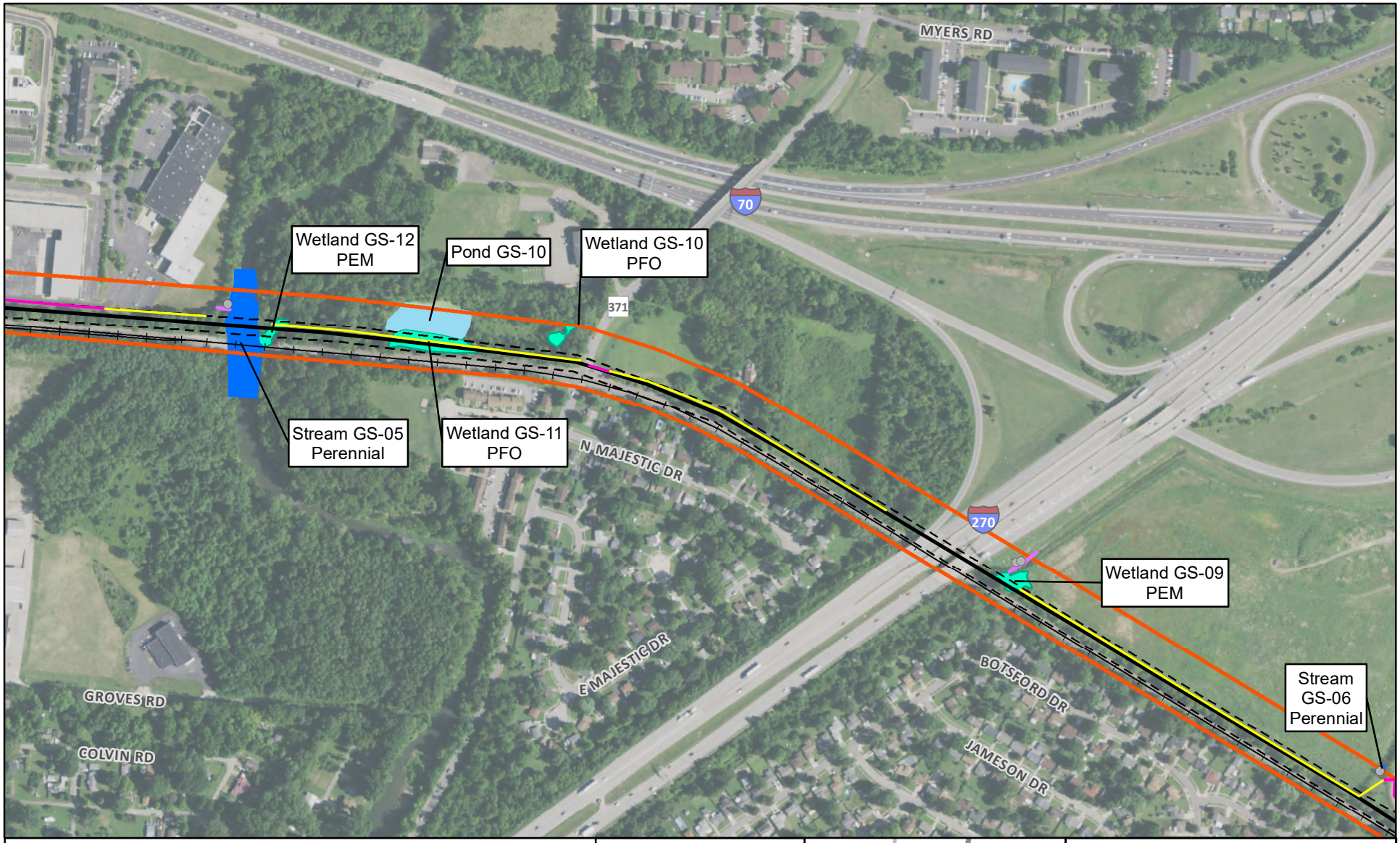


Figure 8-2C
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

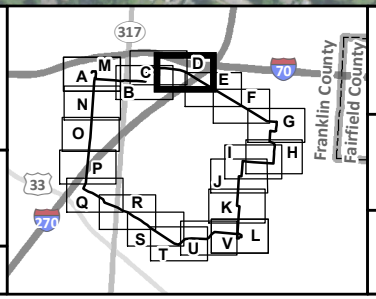
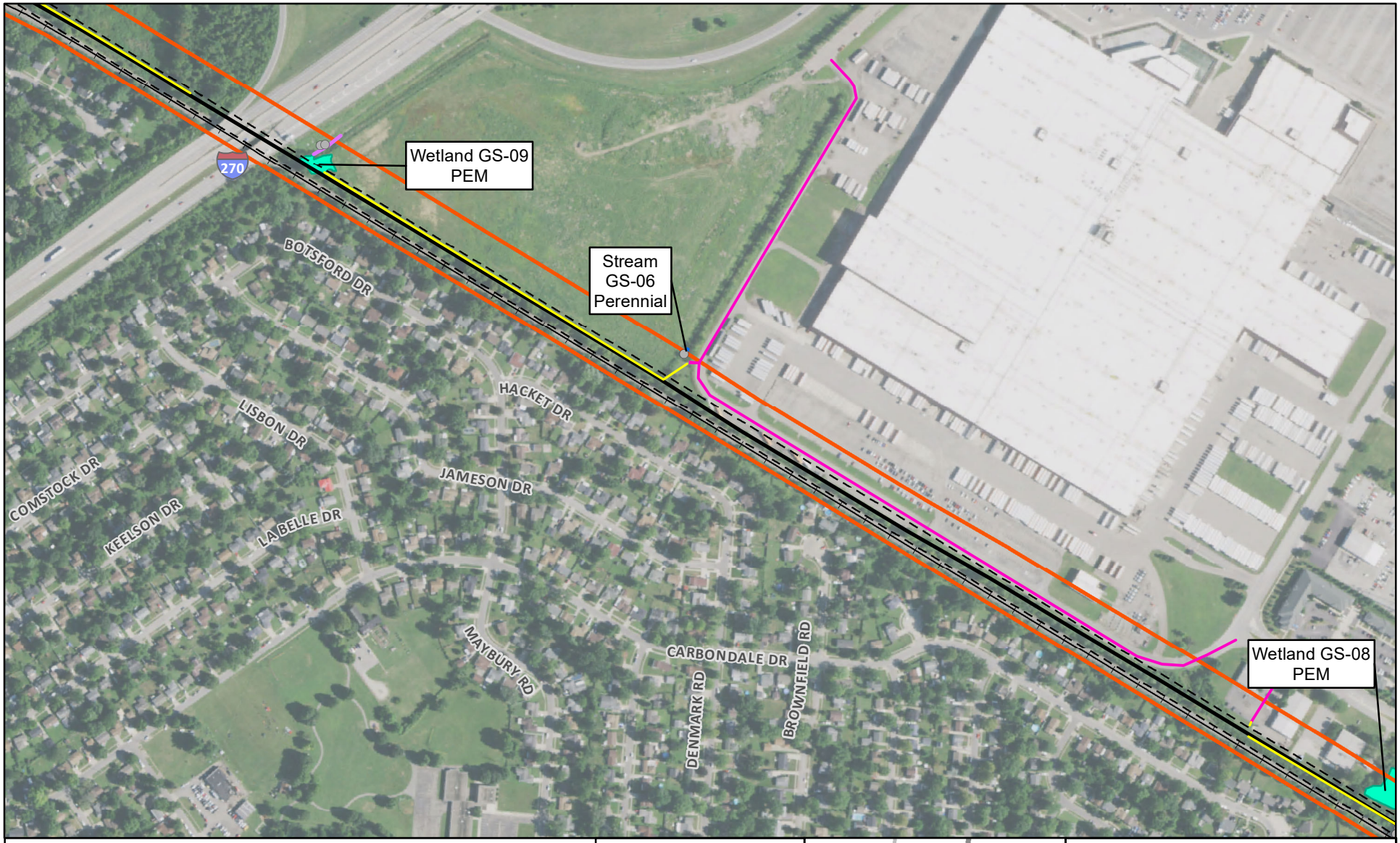


Figure 8-2D
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

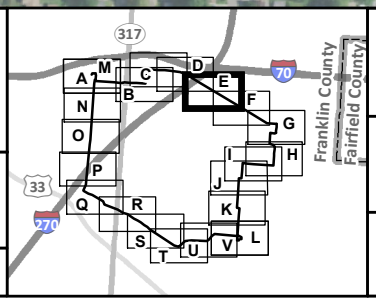
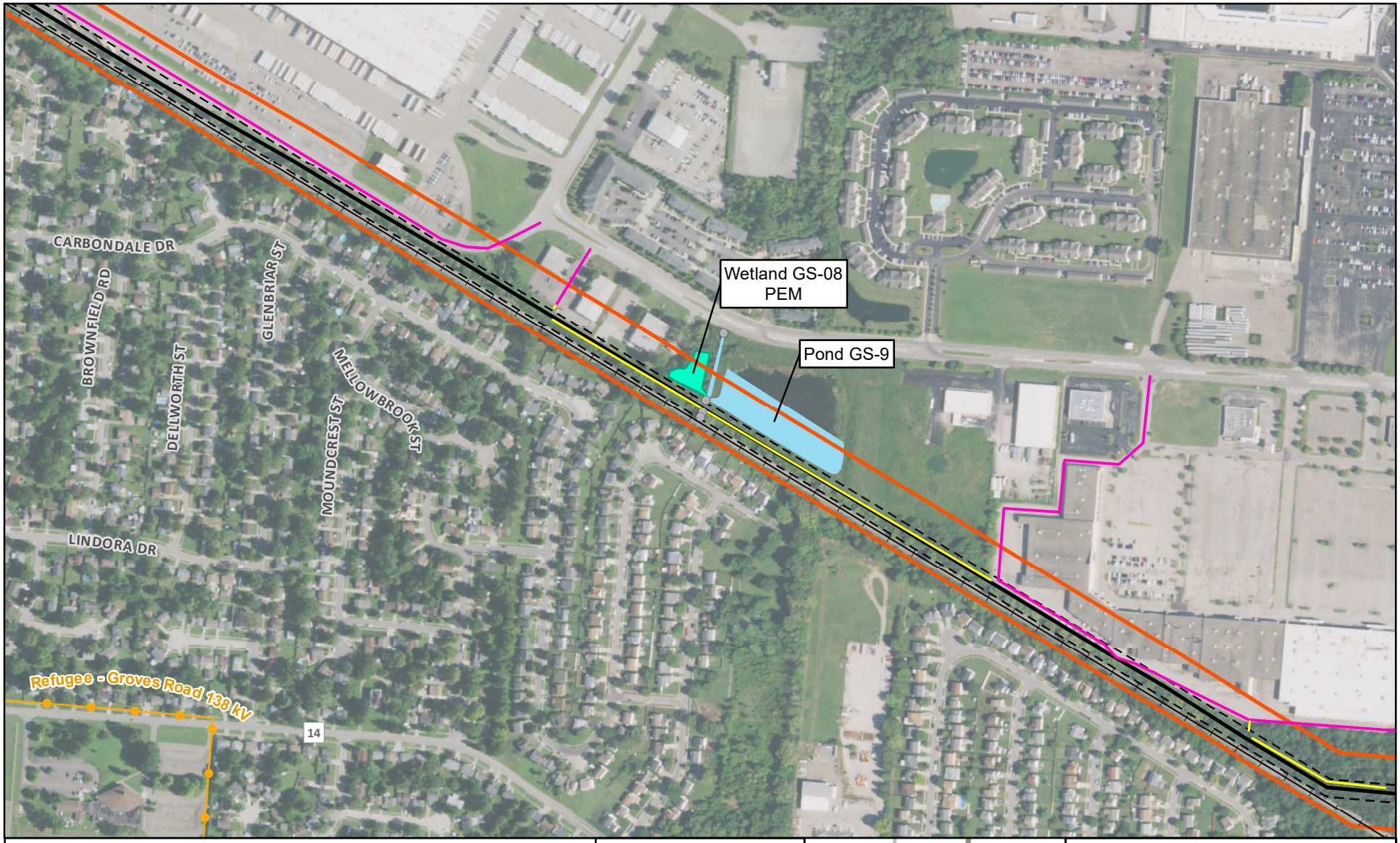


Figure 8-2E
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

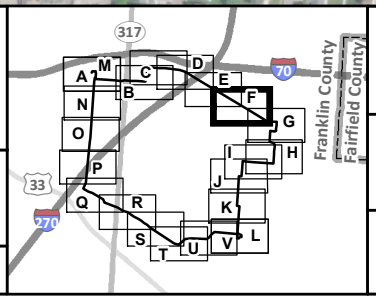
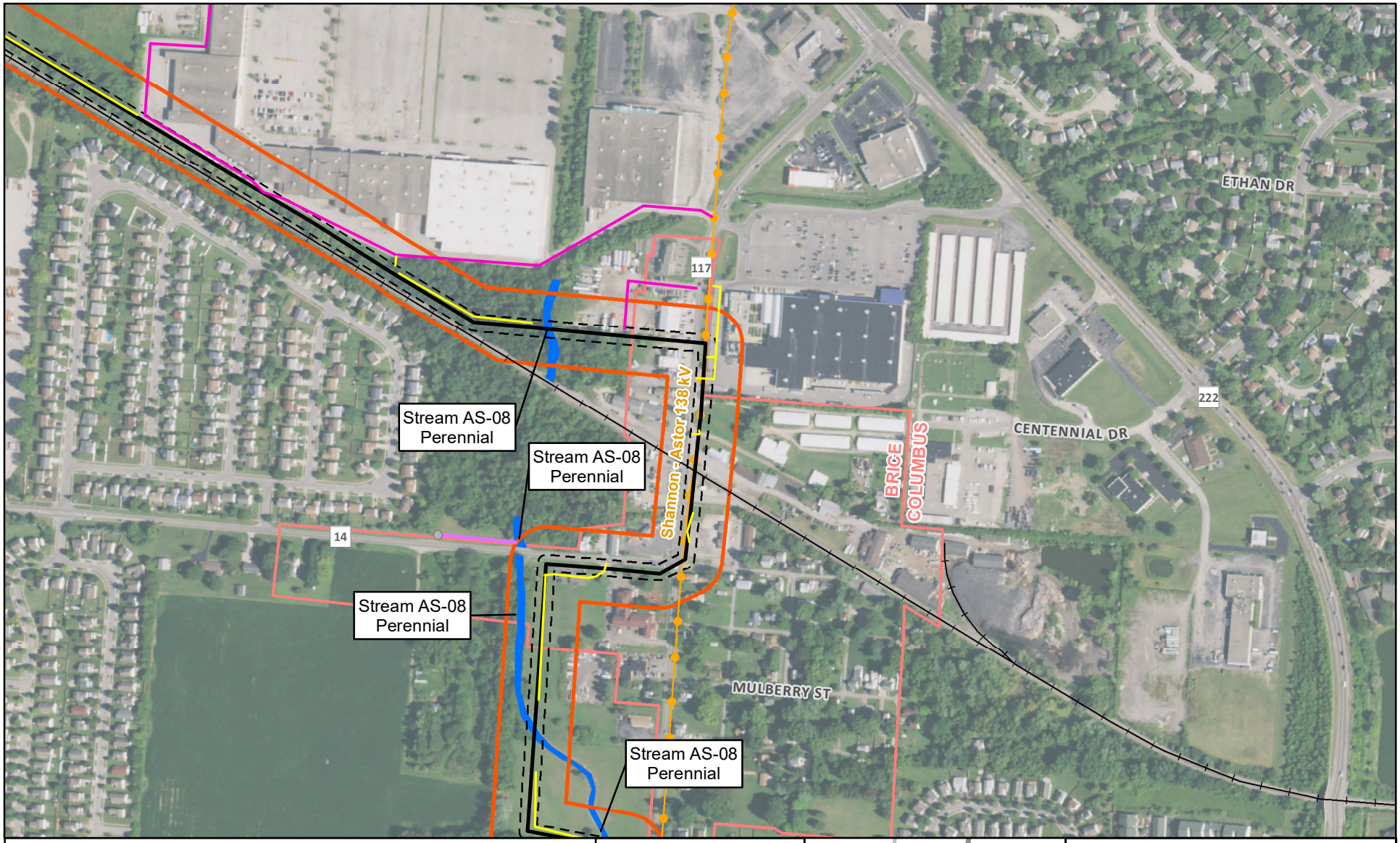


Figure 8-2F
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

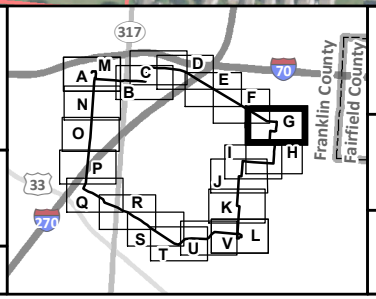
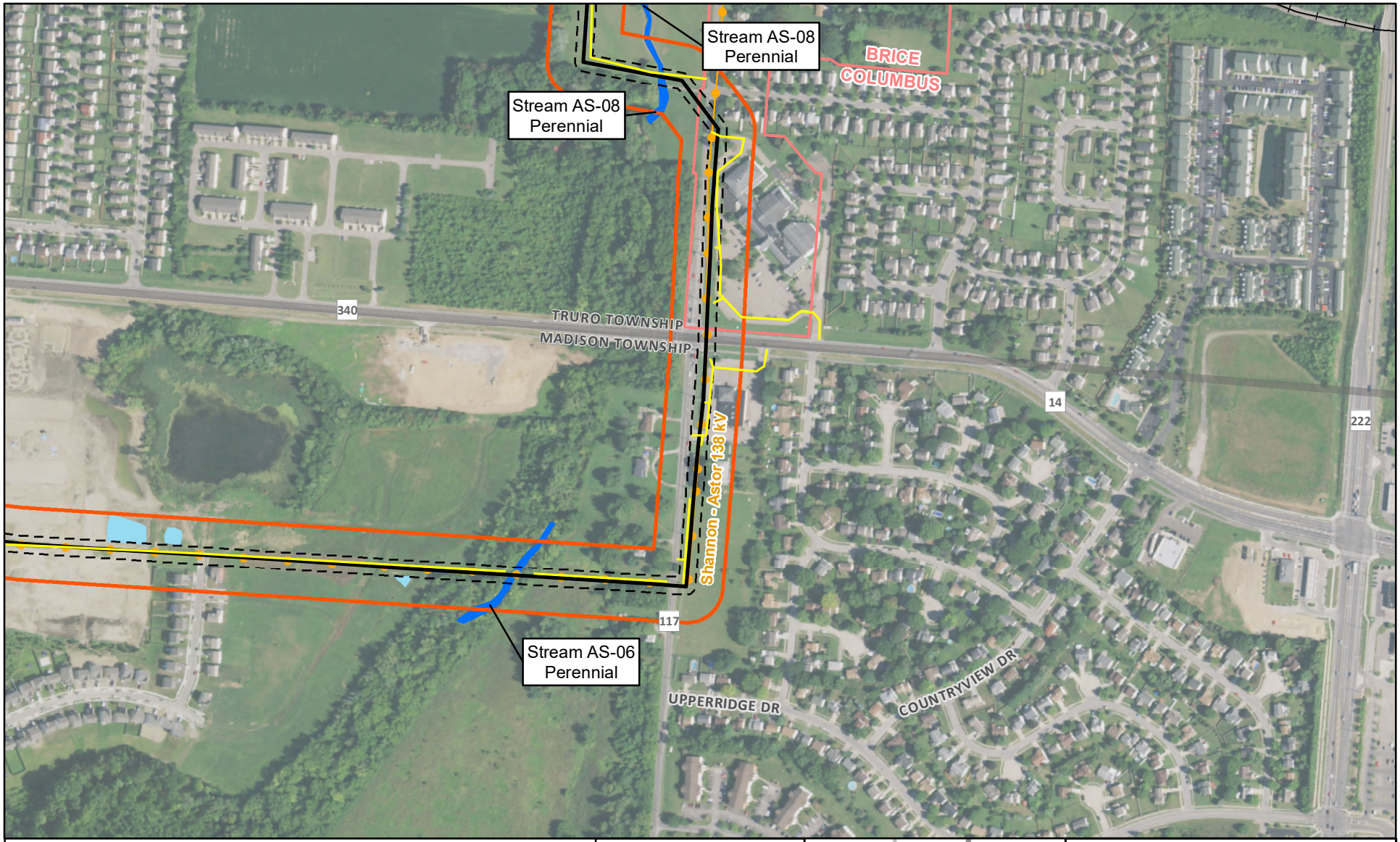


Figure 8-2G
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

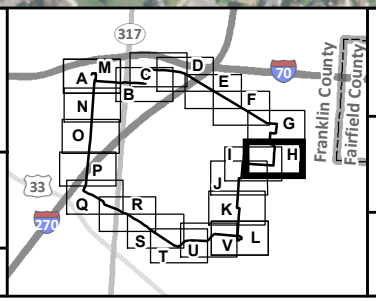
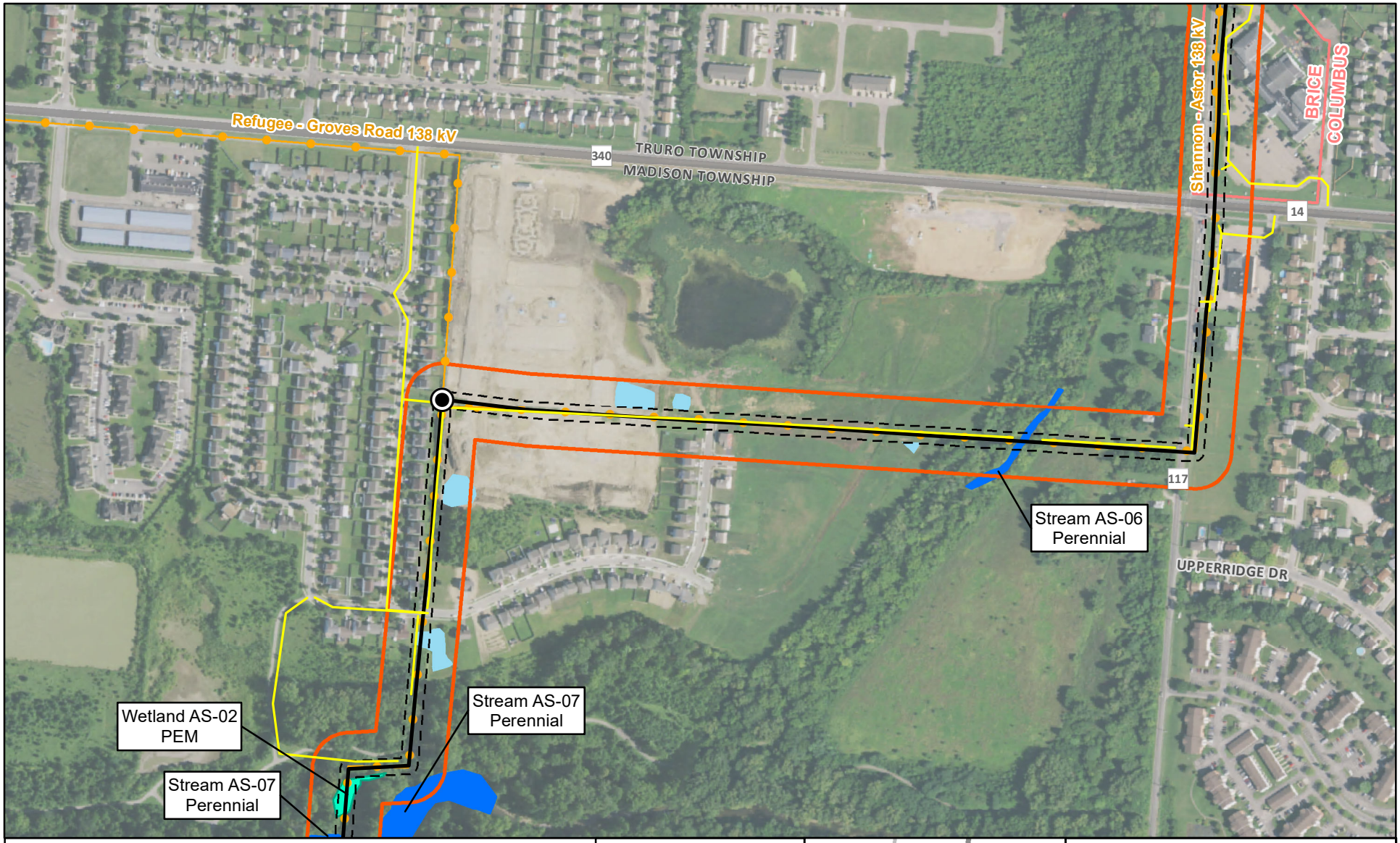


Figure 8-2H
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

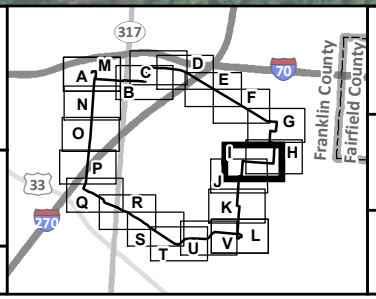
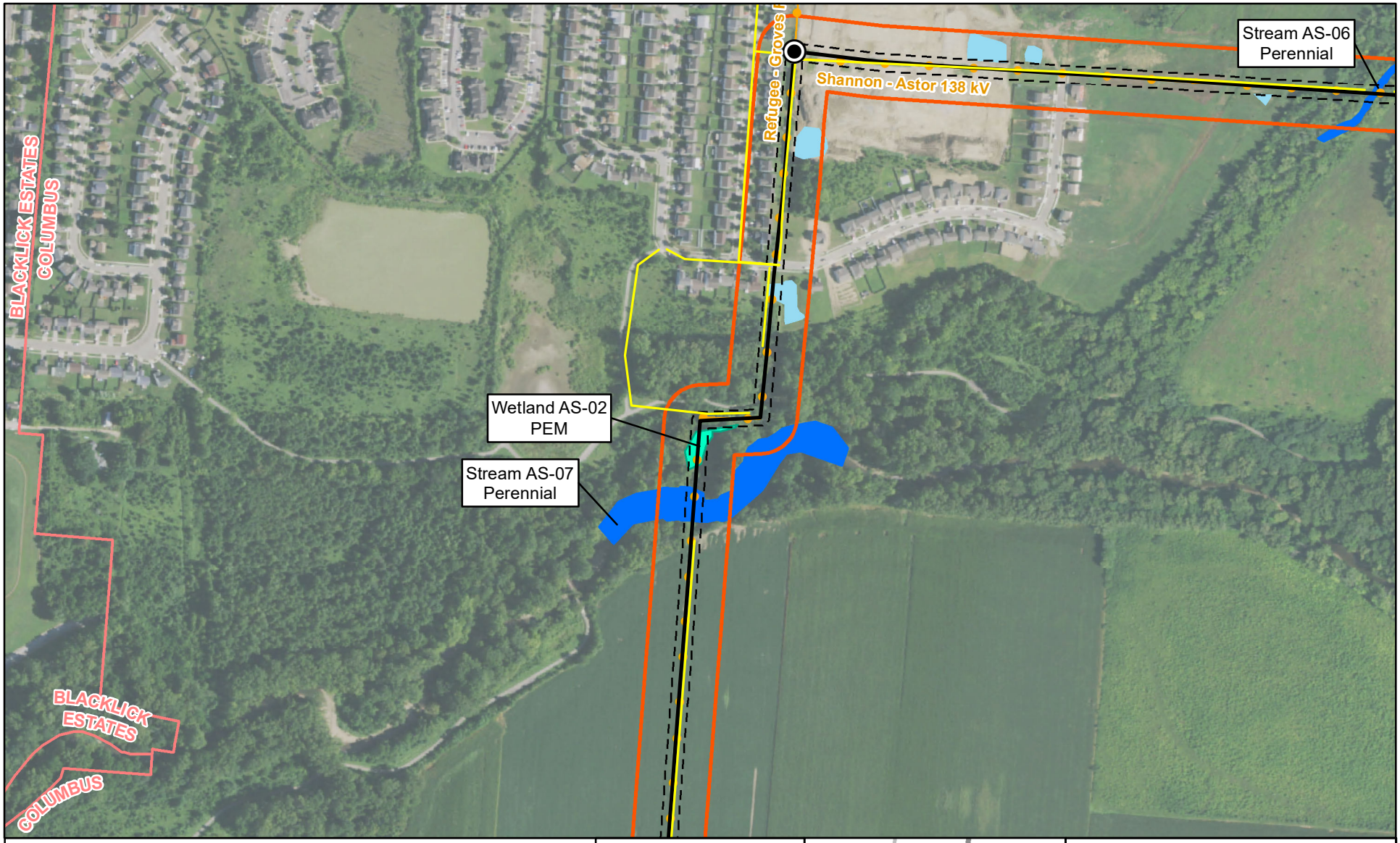


Figure 8-2I
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

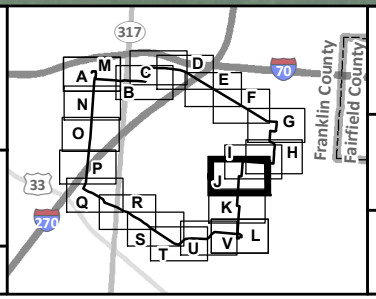
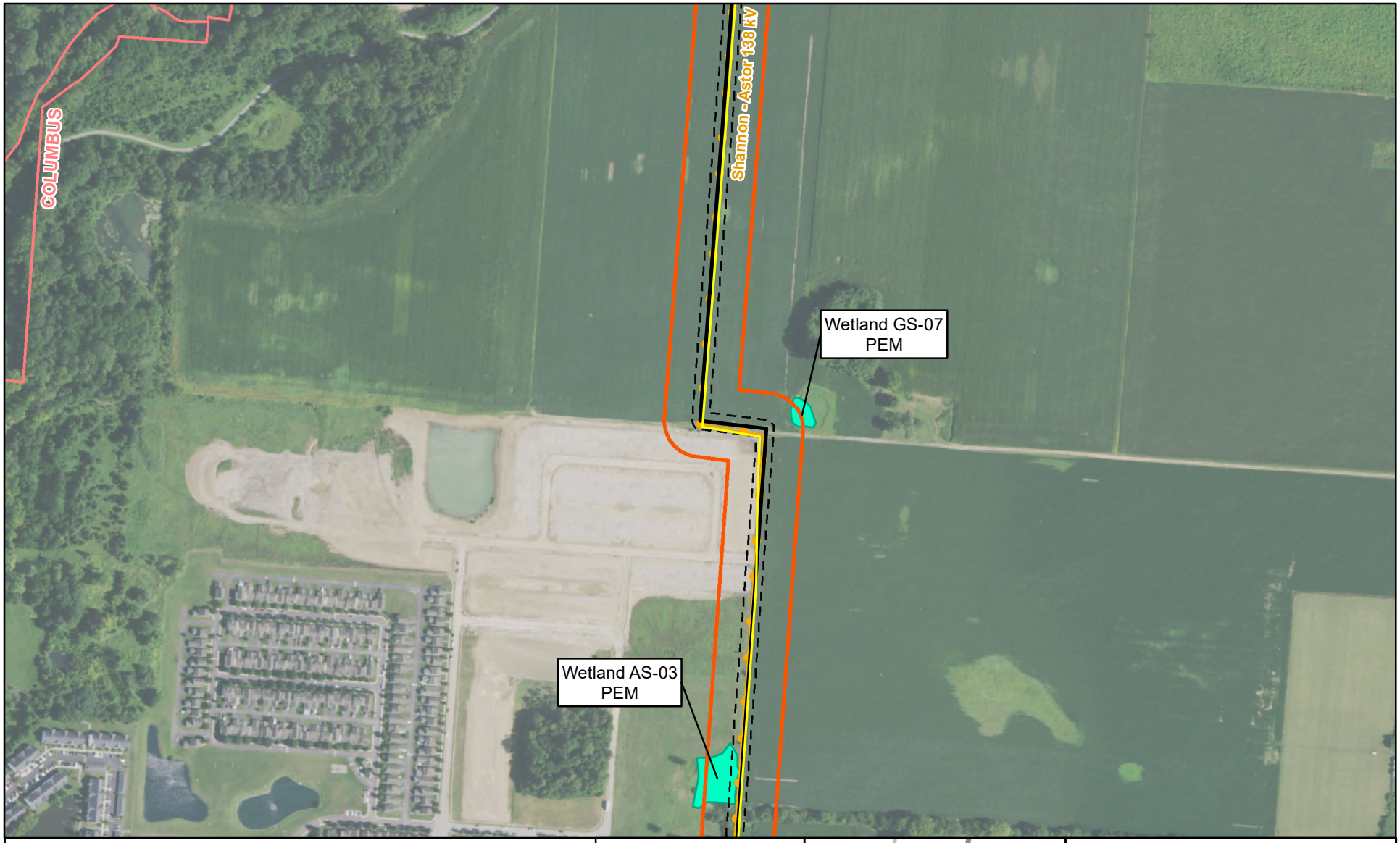


Figure 8-2J
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

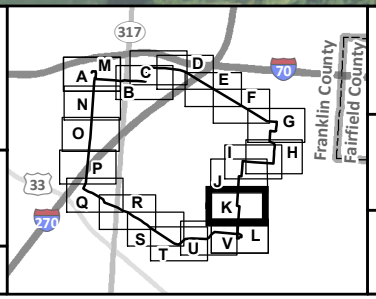
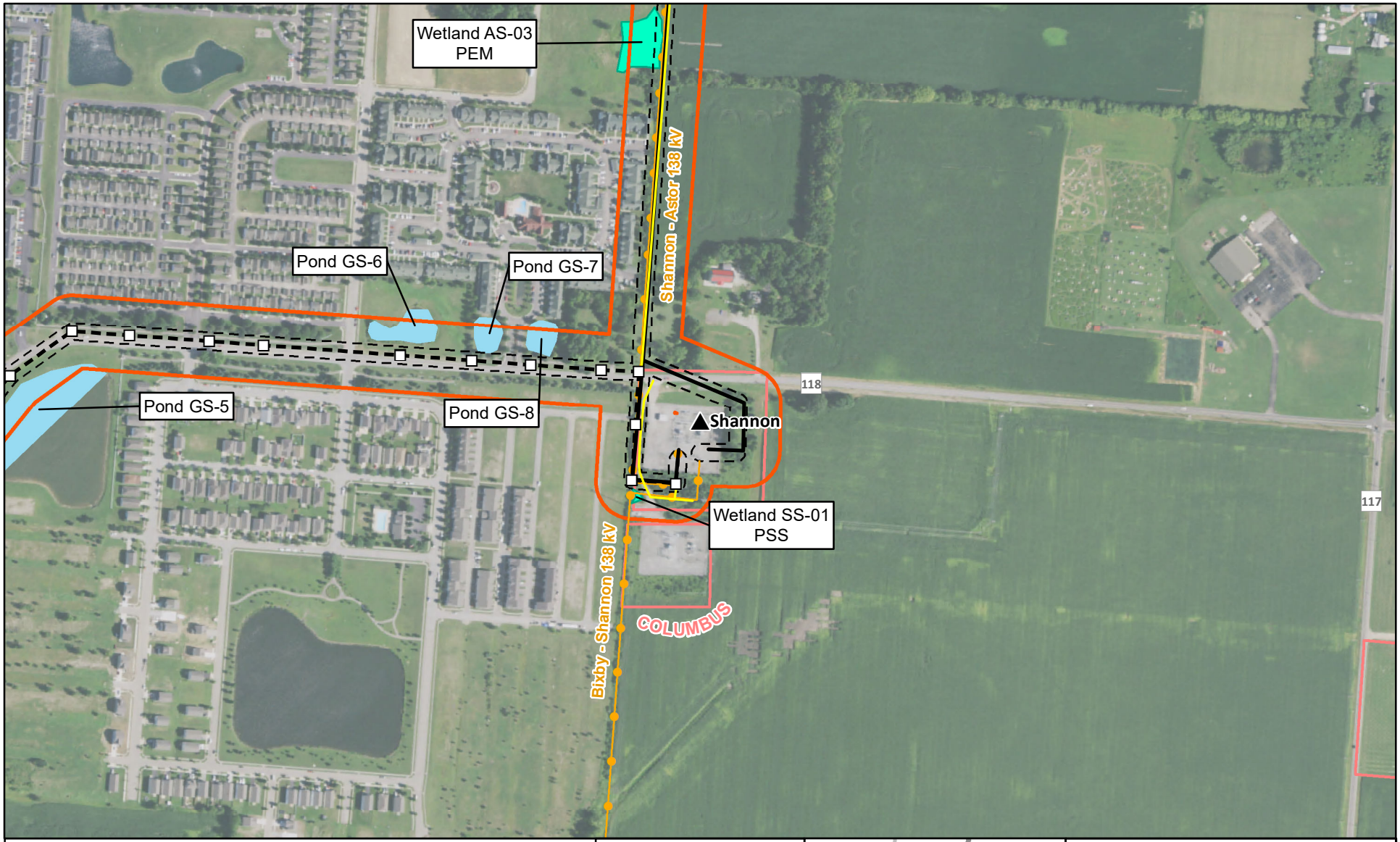


Figure 8-2K
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

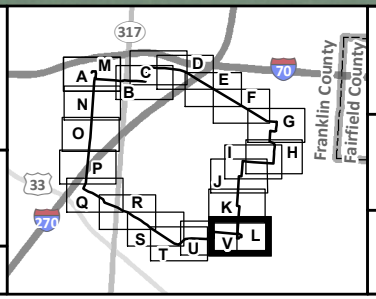
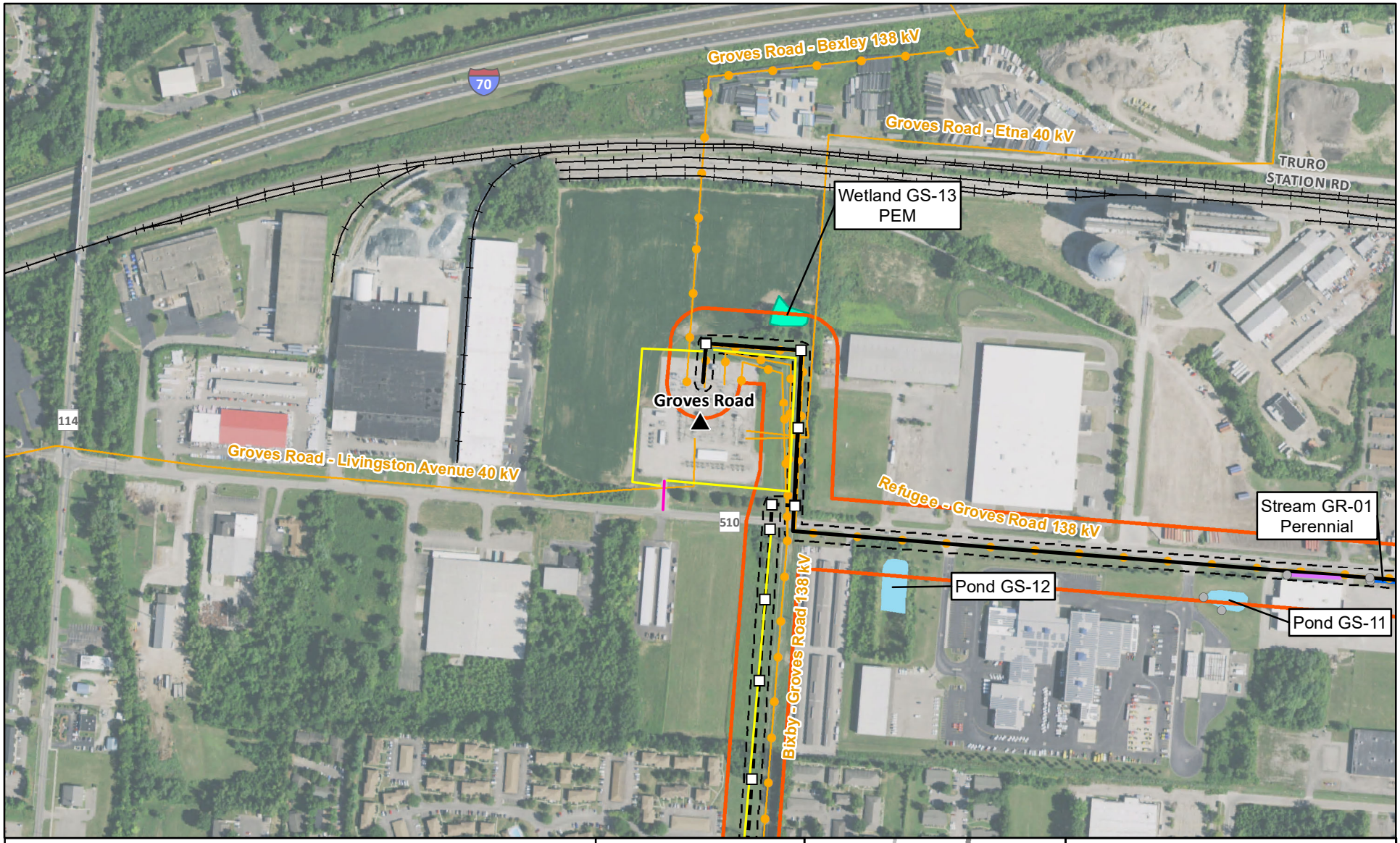


Figure 8-2L
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

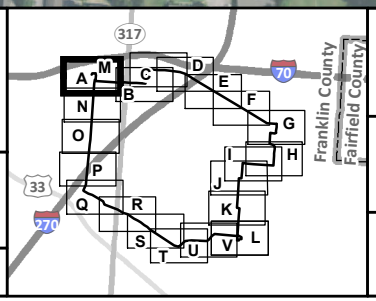
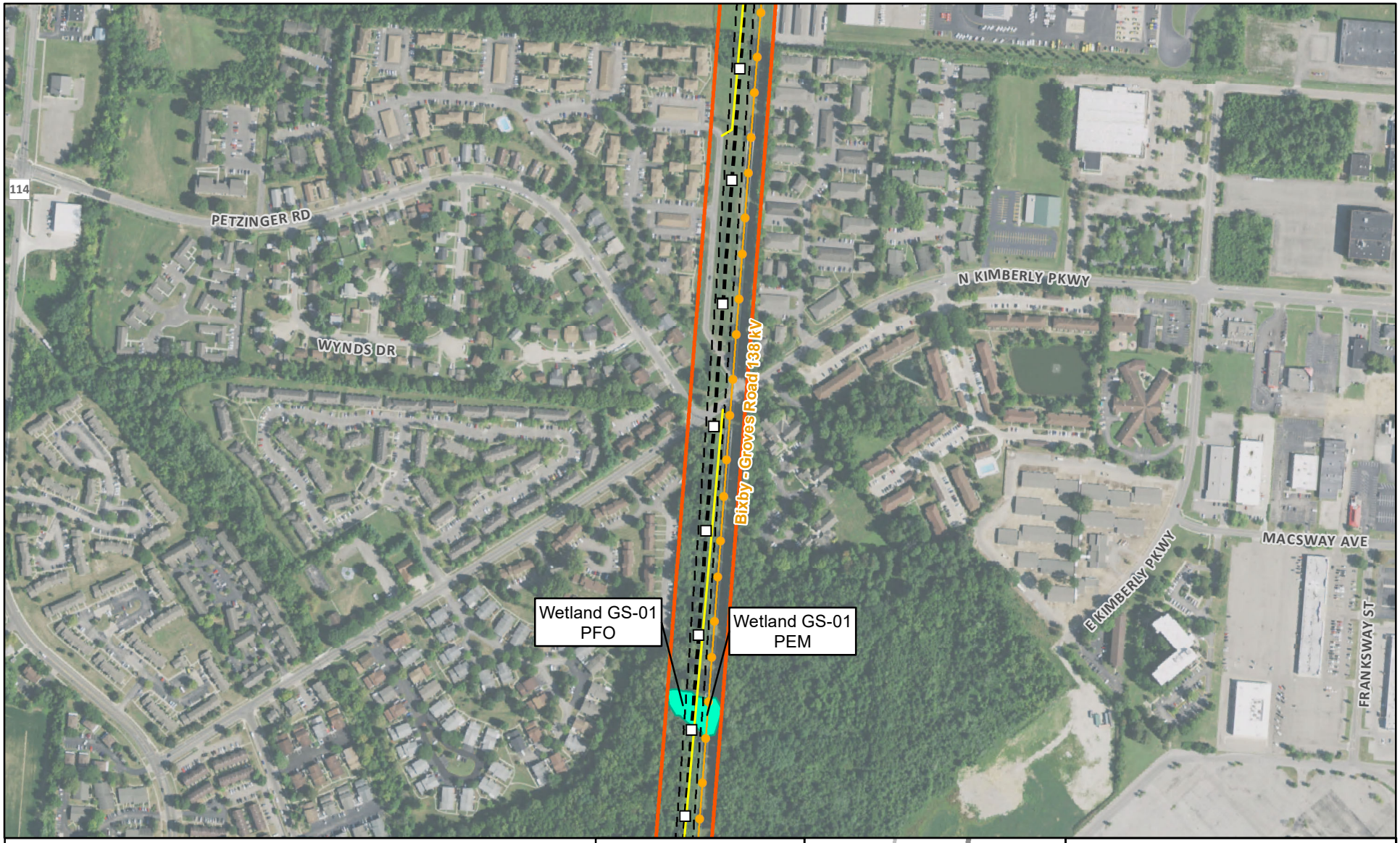


Figure 8-2M
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

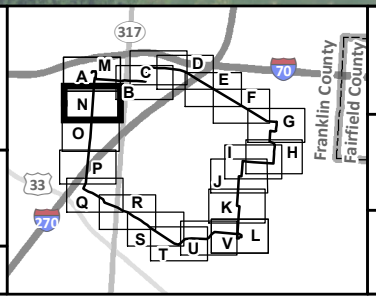
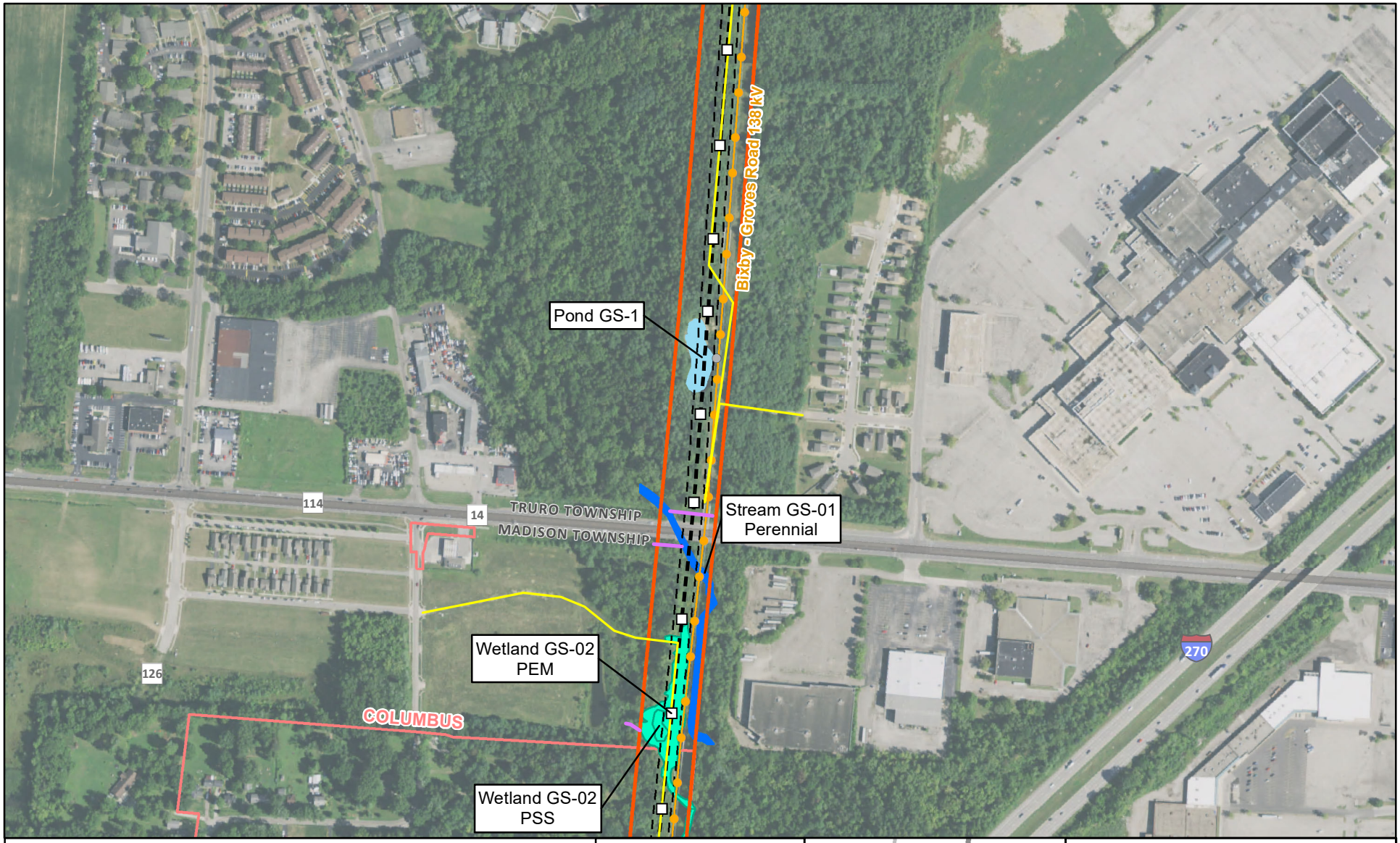


Figure 8-2N
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

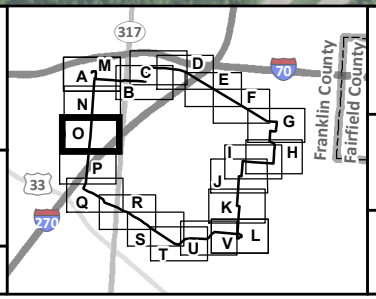
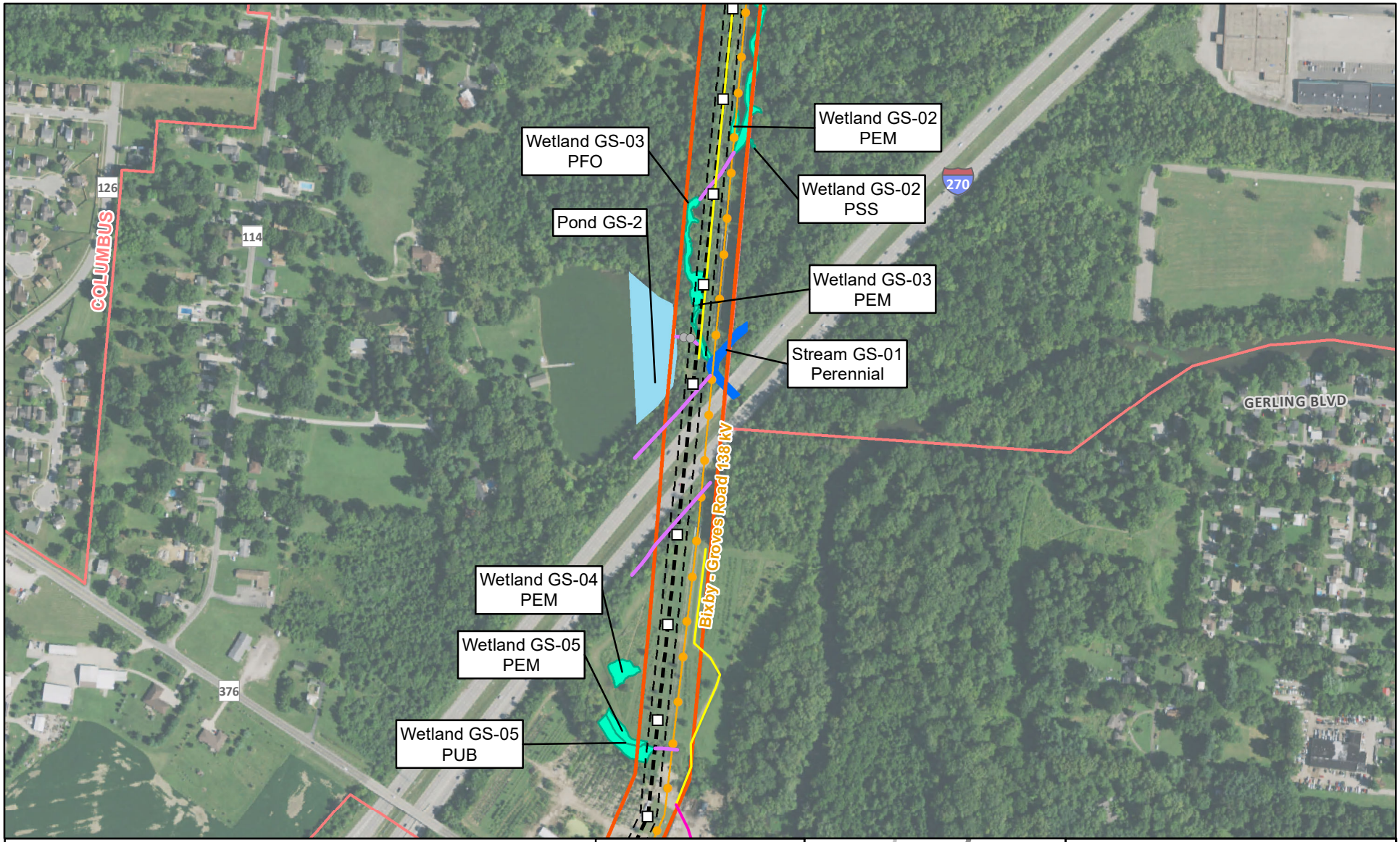


Figure 8-20
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

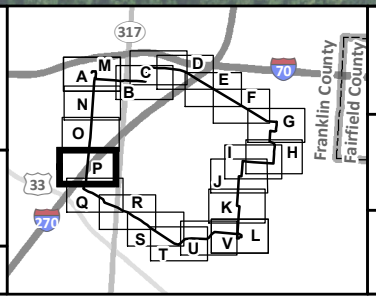
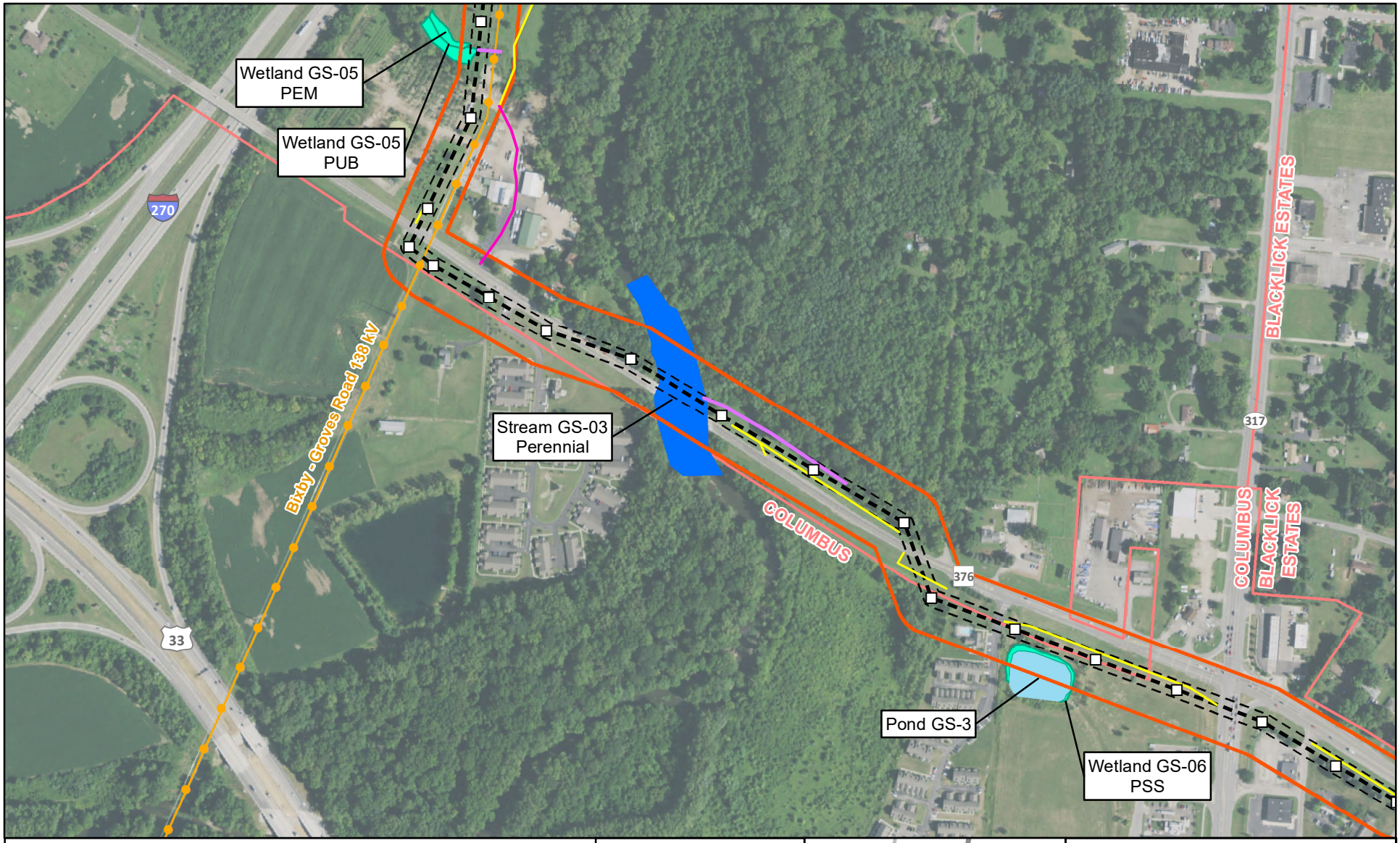


Figure 8-2P
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

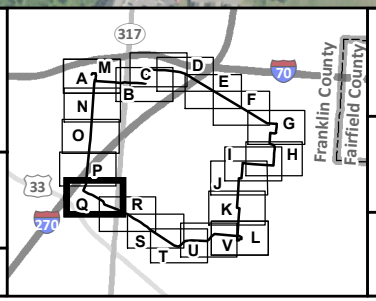
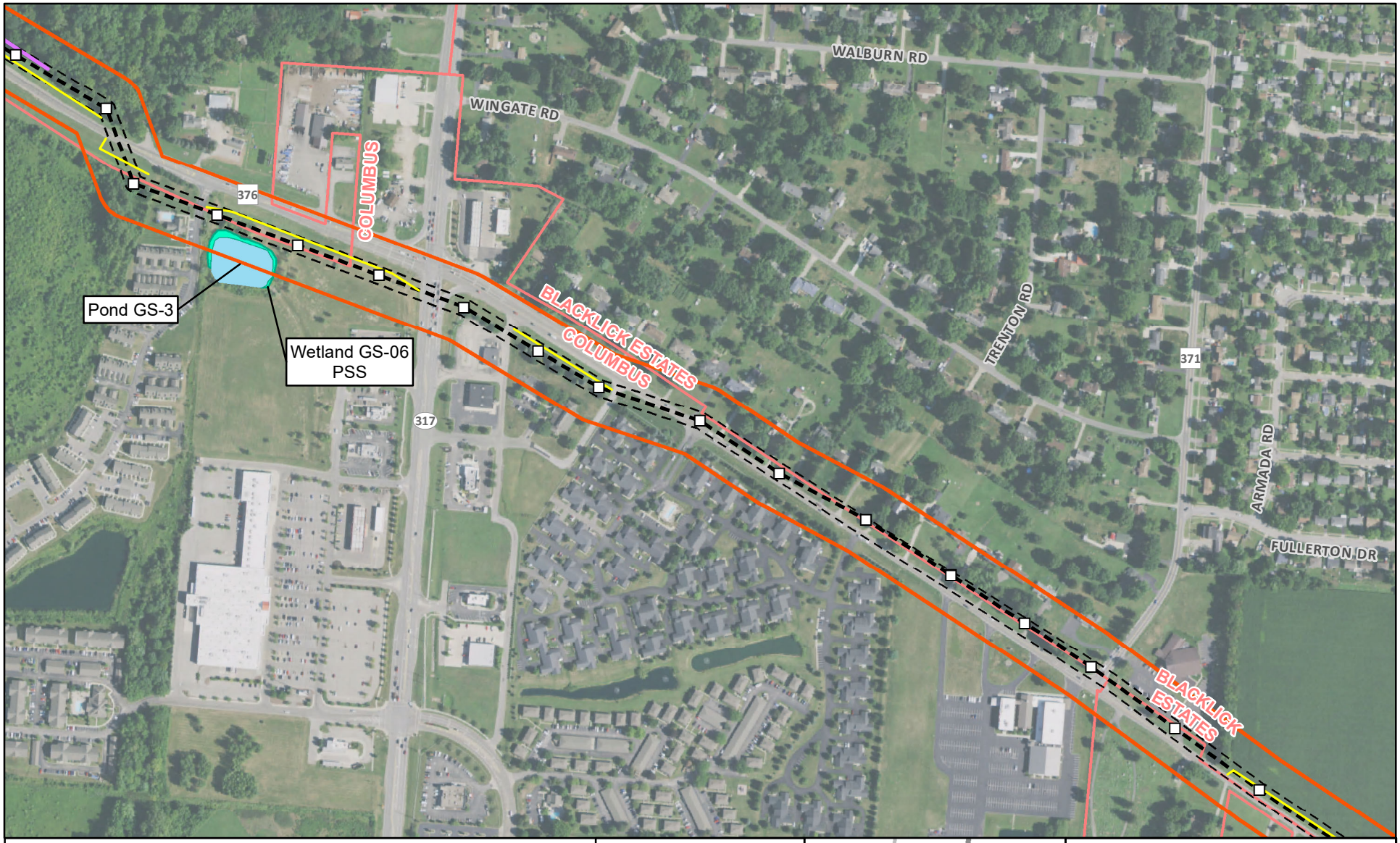


Figure 8-2Q
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

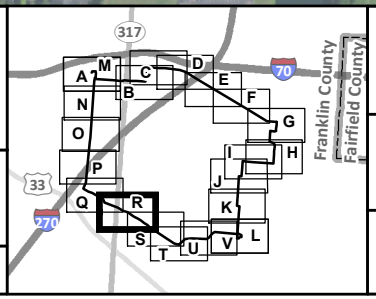


Figure 8-2R
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

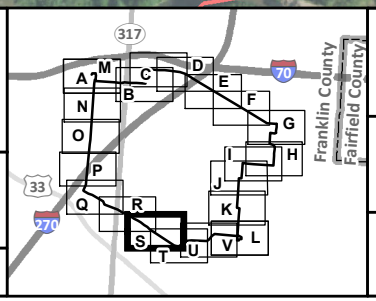
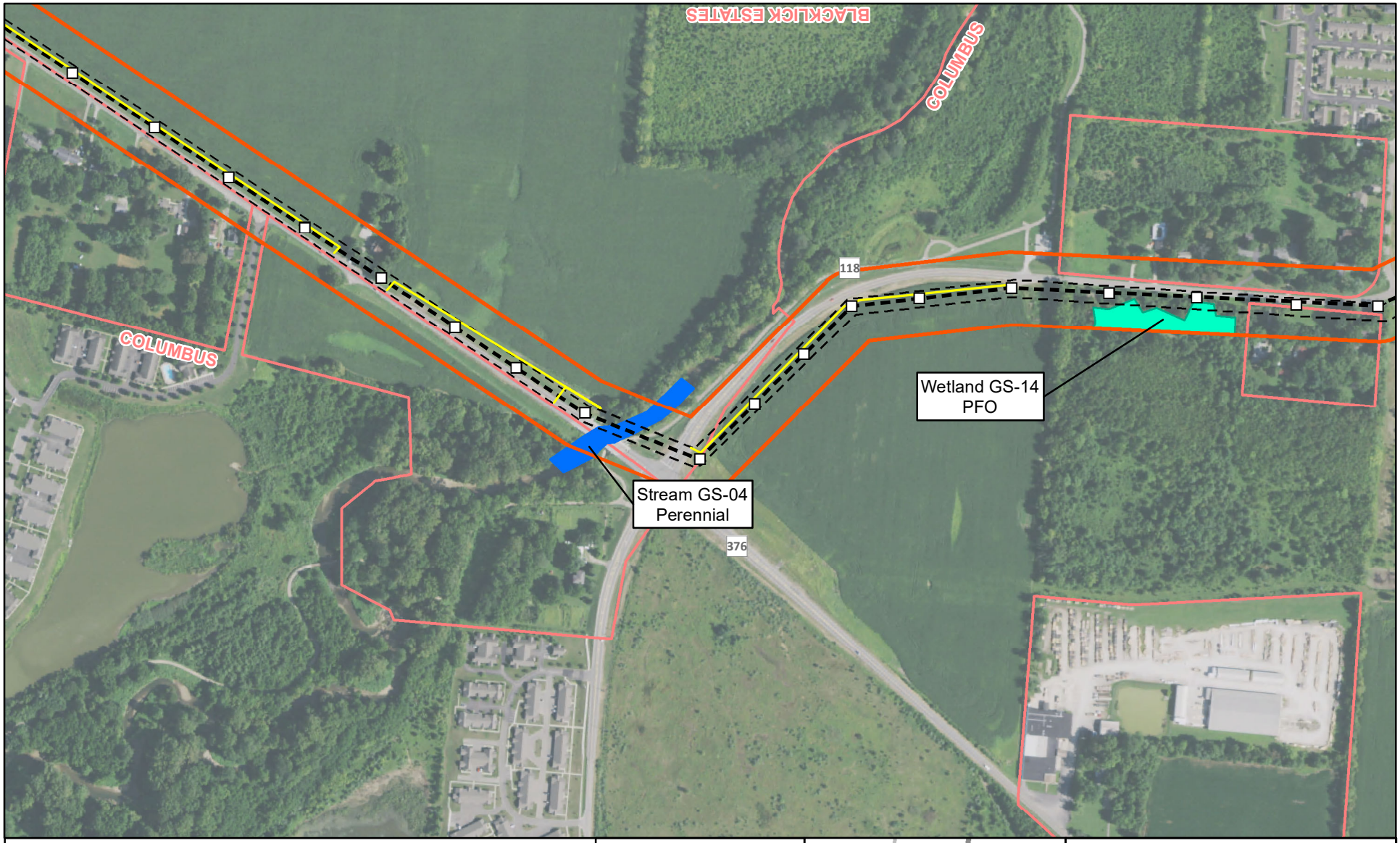


Figure 8-2S
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

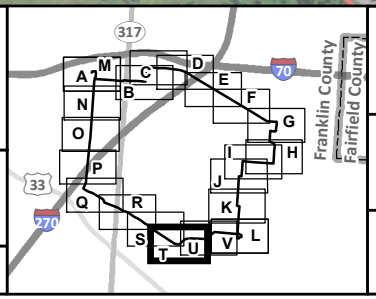
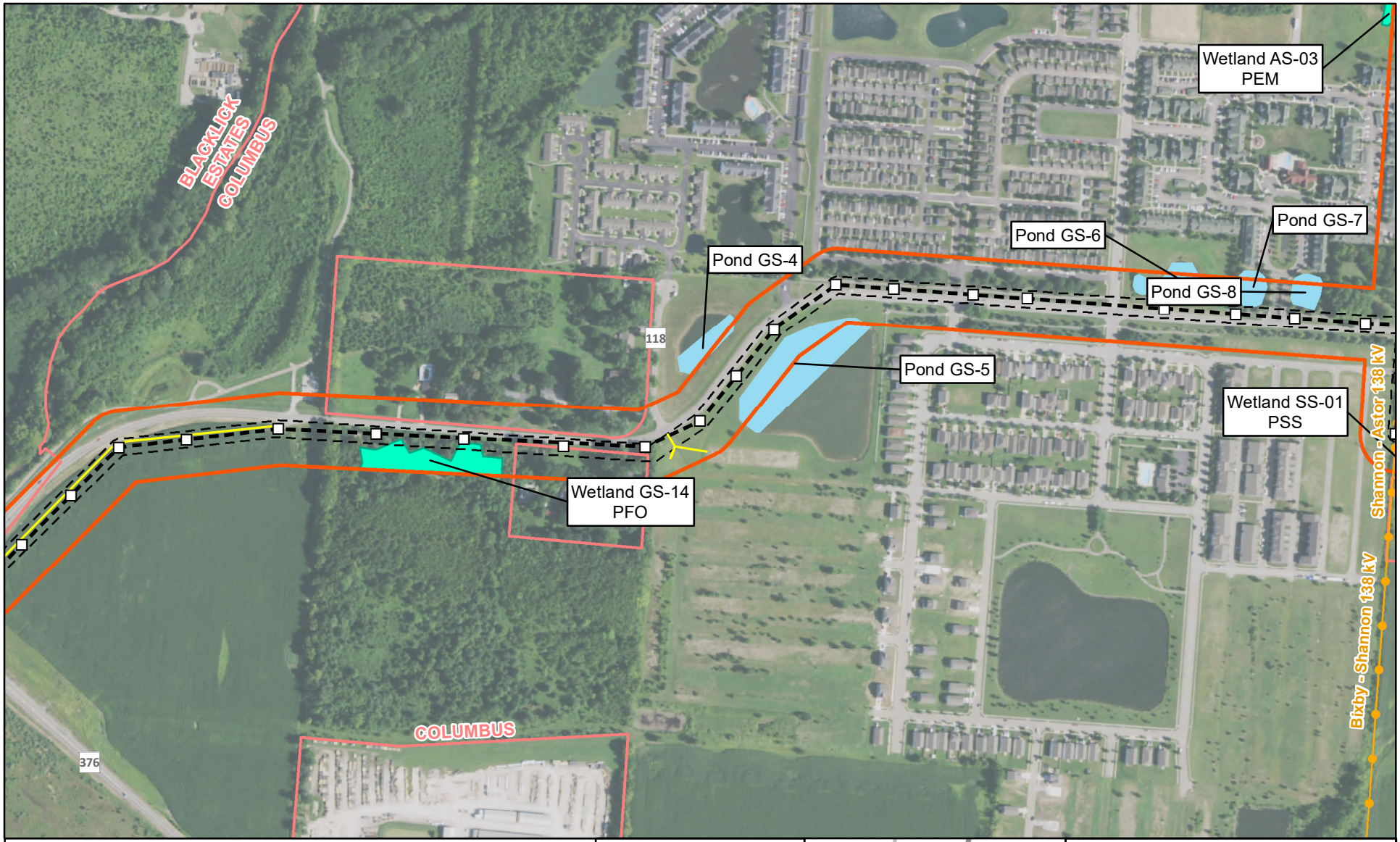


Figure 8-2T
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

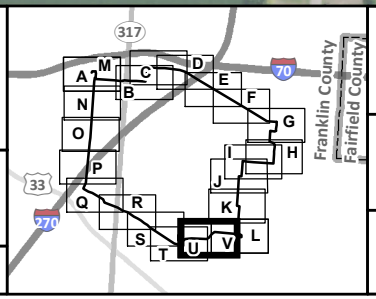
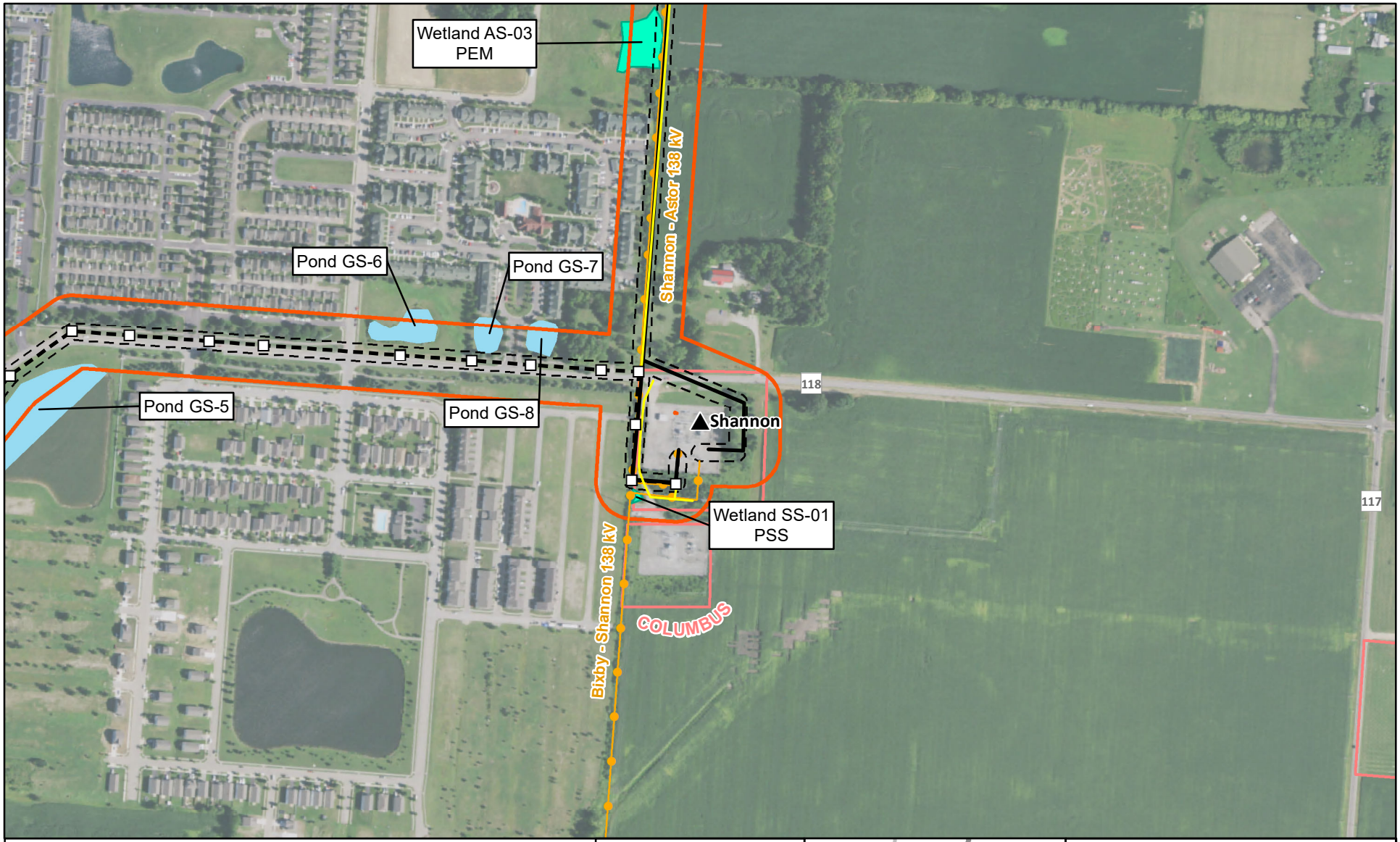


Figure 8-2U
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet



Proposed Structure Location
Existing Station
Refugee Switch (to be removed)
Culvert
Preferred Route
Alternate Route

Preliminary Access Roads
Existing
Proposed

Existing Transmission Line
69 kV and below
138 kV
345 kV

Railroad
Upland Drainage Feature
Delineated Stream
Railroad
Proposed ROW
Ecological Survey Corridor

Delineated Stream
Delineated Pond
Delineated Wetland
Township Boundary
Municipal Boundary

Data Sources:
AEP (2017)
ESRI (2021)
NAIP (2019)
ODOT (2021)

State Plane Ohio South
NAD 83

March 03, 2022

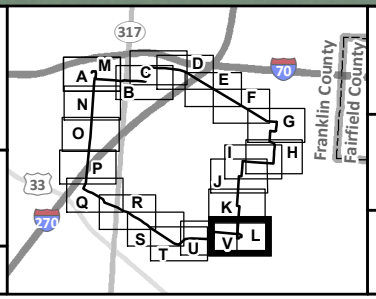


Figure 8-2V
Delineated Resources

AEP OHIO TRANSMISSION COMPANY
An AEP Company
BOUNDLESS ENERGY

Groves Road - Shannon 138 kV
Transmission Line Project

0 500 1,000
Feet

APPENDIX 8-1:

Ecological Survey Report

ECOLOGICAL SURVEY REPORT

GROVES ROAD – SHANNON 138 KV TRANSMISSION LINE PROJECT (PREFERRED AND ALTERNATE ROUTES)

FRANKLIN COUNTY, OHIO

Prepared for:
AEP Transmission
8600 Smith's Mill Road
New Albany, Ohio 43054

Prepared by:
WSP USA
312 Elm Street, Suite 2500
Cincinnati, Ohio 45202

February 2022

TABLE OF CONTENTS

Section			Page No.
1.0	**INTRODUCTION**		**1**
2.0	**BACKGROUND INFORMATION**		**1**
	2.1	Project Area	1
		2.1.1 Annual Precipitation	1
		2.1.2 Drainage Basins	2
		2.1.3 Traditionally Navigable Waters	2
3.0	**METHODOLOGY**		**3**
	3.1	Desktop Review	3
	3.2	Site Investigation	4
		3.2.1 Hydrology	4
		3.2.2 Vegetation	4
		3.2.3 Soils	5
	3.3	Wetland Classification	5
	3.4	Ohio Rapid Assessment Method v. 5.0	6
	3.5	Stream and River Crossings	6
		3.5.1 OEPA Qualitative Habitat Evaluation Index	6
		3.5.2 OEPA Primary Headwater Habitat Evaluation Index	7
4.0	**RESULTS**		**8**
	4.1	Desktop Review	8
		4.1.1 Soils Evaluation	8
		4.1.2 National Wetlands Inventory Map Review	8
	4.2	Delineated Wetlands	11
	4.3	Streams and Rivers	12
		4.3.1 QHEI Stream Results	13
		4.3.2 HHEI Stream Results	13
	4.4	Ponds, Lakes, and Reservoirs	13
	4.5	Vegetative Communities	13
	4.6	Threatened and Endangered Species Coordination	14
		4.6.1 USFWS Coordination	15
		4.6.2 ODNR Coordination	15
5.0	**SUMMARY**		**15**
6.0	**REFERENCES**		**18**

TABLES

Table 2-1: Recent Precipitation Data 2
Table 2-2: 12-Digit HUCs Crossed by the Project 2
Table 4-1: NWI Summary Table 10
Table 4-2: Wetland Summary Table 12
Table 4-3: Vegetative Communities Within the ESC 14

APPENDICES

Appendix A. Figures

- Figure 1. Project Location Map
- Figure 2. Environmental Basemap
- Figure 3. Delineated Features
- Figure 4. Vegetation Coverage

Appendix B. Reference Tables

- Table 1. NRCS Soil Map Units in the ESC
- Table 2. Wetlands Delineated within the ESC
- Table 3. Streams Delineated within the ESC
- Table 4. Ponds Delineated Within the ESC
- Table 5. Listed Species Commented on by USFWS and ODNR

Appendix C. U.S. Army Corps of Engineers (USACE) Wetland Determination Forms – Midwest Region

Appendix D. OEPA ORAM Wetland Data Forms

Appendix E. OEPA QHEI/HHEI Stream Data Forms

Appendix F. Representative Photographs

Appendix G. Threatened and Endangered Species Coordination

1.0 INTRODUCTION

On behalf of American Electric Power (AEP) Ohio Transmission Company, Inc. (AEP Ohio Transco), WSP USA (WSP) conducted environmental surveys for the proposed Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project ("Project"), located in Madison and Truro Townships, Franklin County, Ohio. The environmental surveys included a wetland and water resource delineation and characterization of potential habitat for state- and federally-listed species. The wetland delineation was performed by individuals trained in the three-parameter methodology (hydrophytic vegetation, wetland hydrology, and hydric soils) adopted by the U.S. Army Corps of Engineers (USACE) as outlined in the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE, 2010) and in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987).

2.0 BACKGROUND INFORMATION

2.1 Project Area

The Project is located within Truro and Madison Townships, Franklin County, Ohio. The Project Environmental Survey Corridors (ESC) originate north of Groves Road and east of Courtright Road at the existing Groves Road Substation (approximate coordinate 39.931754°, -82.890049°) and generally head south and east to the existing Shannon Substation (approximate coordinate 39.892689°, -82.843240°) south of Shannon Road and west of Brice Road (Figure 1, Appendix A). The ESC is within the Reynoldsburg and Southeast Columbus Ohio U.S. Geological Survey (USGS) 7.5-minute topographic map quadrangle boundaries. The ESC generally consists of a 260-foot wide ROW, comprising of approximately 330.4 acres; 194.8 acres for the Preferred Route and 148.7 acres for the Alternate Route (approximately 13.1 acres of the ESC overlap between the Preferred Route and Alternate Route).

Topographic relief within the ESC is limited to relatively gradual elevation changes, with elevations ranging between 725 feet and 797 feet above sea level throughout the ESC (Figure 1, Appendix A).

Land uses and natural communities observed within the ESC are primarily composed of agricultural land, scrub-shrub habitat, old field habitat, successional hardwood forest, landscaped areas, and urban land uses in addition to the identified ponds, streams, and wetlands.

2.1.1 Annual Precipitation

Recent rainfall data for Franklin County, Ohio was reviewed prior to completing the environmental survey to determine if climatic conditions were normal at the time of the survey. The nearest weather station with both historical and recent precipitation records is located at the John Glenn International Airport, in Franklin, Ohio, approximately 4.25 miles north of the Project. Rainfall recorded at this location was below normal for seven of eight months between December 2020 and July 2021 (Table 2-1). The data suggest climatic conditions were generally drier than normal during the eight-month time period prior to the environmental survey. The precipitation records were taken into consideration during environmental surveys.

Table 2-1: Recent Precipitation Data									
Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project									
2020 - 2021 Precipitation Data	**December 2020**	**January 2021**	**February 2021**	**March 2021**	**April 2021**	**May 2021**	**June 2021**	**July 2021**	**Total**
Monthly Sum[1, 3]	2.24	2.25	2.23	2.85	3.28	3.46	2.58	4.64	**23.53**
Normal Precipitation[2, 3]	3.58	2.68	2.86	4.46	3.71	3.61	4.93	4.58	**30.41**
Monthly climatic conditions	Below Normal	Below Normal	Below Normal	Below Normal	Below Normal	Below Normal	Below Normal	Above Normal	**Below Normal**

[1] Monthly weather summary from John Glenn International Airport, Columbus, Ohio weather station (NOAA 2020, 2021)

[2] Climate Statistics at Individual Stations – Data Tables (NOAA 2020, 2021)

[3] Displayed in inches

2.1.2 Drainage Basins

The ESC is located entirely within the Upper Scioto drainage basin, hydrologic unit code (HUC 05060001). The ESC lies entirely within two 12-digit HUCs, as outlined in Table 2-2 (USDA, 2019). The OEPA *401 Water Quality Certification for the Nationwide Permits Web Mapping Application* indicates that field-assessed environmental features within the identified portions of each of the 12-digit sub-watersheds, contain areas that are "ineligible" and "possibly eligible"; this indicates that stream impacts within the ESC are only eligible for coverage under an Individual Section 401 Water Quality Certification (WQC) for the USACE Nationwide Permits, in "ineligible" watersheds in addition to high-quality streams, in "possibly eligible" watersheds, when determined to be high-quality through one of the Nationwide Permit (NWP) eligibility flowcharts (OEPA, 2020).

Table 2-2: 12-Digit HUCs Crossed by the Project			
Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project			
HUC 8-Digit Code[1]	**HUC 12-Digit Code[1]**	**HUC 12-Digit Name[1]**	**Ohio EPA Section 401 Eligibility[2]**
05060001	050600011504	Town of Brice-Blacklick Creek	Ineligible / Possibly Eligible
05060001	050600011505	Mason Run-Big Walnut Creek	Ineligible / Possibly Eligible

[1]Source: USDA 2019

[2]Source: OEPA 2020

2.1.3 Traditionally Navigable Waters

The U.S. Environmental Protection Agency (USEPA) and USACE assert jurisdiction over "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce including all waters which are subject to the ebb and flow of the tide"

(USACE and USEPA, 2008). These waters are considered traditionally navigable waters (TNW). All identified streams are tributaries to the Scioto River, which flows into the Ohio River, a traditionally navigable waterway. However, no TNWs are crossed by the Project.

3.0 METHODOLOGY

The purpose of the environmental surveys was to determine whether wetlands and streams are present within the ESC that meet the definition of Waters of the United States (WoUS) or are subject to regulations implemented by USACE and the Ohio Environmental Protection Agency (OEPA); and, if present, to document their extents and current conditions. The USACE and the USEPA define wetlands as areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR, Part 328.3). Identification and delineation of jurisdictional wetlands is based on the presence of the following three parameters:

1. Wetland hydrology – the area is inundated permanently or periodically, or the soil is saturated to the surface for sufficient duration during the growing season to support hydrophytic vegetation.
2. Hydrophytic vegetation – the dominant vegetation consists of species capable of growing in water or on substrate that is at least periodically deficient in oxygen as a result of the presence of water.
3. Hydric soils – soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth of hydrophytic vegetation.

The ESC was evaluated according to the procedures outlined in the USACE 1987 *Corps of Engineers Wetlands Delineation Manual ('87 Manual)* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, (Version 2.0)* (*Regional Supplement*) (USACE, 2010). The *Regional Supplement* was released by the USACE to improve the accuracy and efficiency of wetland delineation procedures by addressing regional wetland characteristics and was finalized in 2010.

WSP performed the routine delineation method described in the *'87 Manual* and *Regional Supplement*. WSP conducted a desktop data review followed by pedestrian environmental surveys; including, identification of vegetative communities; soils profile descriptions; recording geomorphological descriptions; and observations of hydrology. Evidence of mechanical alterations or disturbances with the potential to alter the wetland determination were also noted, if present.

3.1 Desktop Review

Prior to conducting field surveys, WSP ecologists completed a desktop review by analyzing several federal and state publicly available data sources to assist with determining the presence of wetland and streams. This review of Natural Resources Conservation Service (NRCS) soil survey data, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps of Ohio,

USGS 7.5-minute topographic maps, and USGS National Hydrography Dataset (NHD) stream and river data was used to identify the occurrence and location of potential wetlands and streams.

3.2 Site Investigation

On June 28 – 29, July 8, 2021, and February 14, 2022, WSP ecologists traversed the approximately 330.4-acre ESC to conduct a wetland and waters delineation of the two proposed transmission line routes (Preferred and Alternate). Additional wetlands, streams, and ponds were previously delineated from past surveys of other transmission lines in the vicinity of the project, on January 28 – 30, 2020, February 19, and April 20, 2021. Environmental features identified from previous surveys are also included in this report. The physical boundaries of aquatic resources were recorded using a Trimble Global Positioning System (GPS) unit rated for sub-decimeter accuracy. The GPS data was then geo-corrected using Trimble GPS Pathfinder Office software (version 5.60) and reviewed for quality control. The methodology used to examine each parameter is described in the following sections.

3.2.1 Hydrology

During field surveys, WSP ecologists assessed potential wetland areas for indicators of wetland hydrology described in the *'87 Manual* and *Regional Supplement.* Observation of at least one primary indicator or at least two secondary indicators was sufficient to positively say wetland hydrology was present.

According to the *'87 Manual*, areas inundated or saturated to the surface for a minimum of five percent of the growing season may provide sufficient evidence as a suitable primary/secondary wetland indicator. The *'87 Manual* further states that areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands. The *Regional Supplement* suggests that growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) the soil temperature (12-inch depth) is 41 degrees Fahrenheit (°F) or higher as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the approximate growing season is calculated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28°F air temperature in the spring and fall, respectively. National Weather Service Agricultural Applied Climate Information System (AgACIS) WETS (wetlands determination) growing season data for Franklin County indicated an average growing season extending from April 4 to November 5 (215 days) (NRCS, 2020).

3.2.2 Vegetation

To determine the presence of hydrophytic vegetation, dominant vegetation was visually assessed for each stratum (tree, sapling and shrub, herb, and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), or

upland (UPL) was assigned to each plant species based on the *2018 National List of Plant Species* (USACE, 2018)[1]. The hydrophytic vegetation indicators are applied in the sequence presented in the *Regional Supplement*, where the vegetation is determined to be hydrophytic after the first indicator in the sequence is met and no further vegetation analysis is required. In the majority of wetland determinations, the presence of hydrophytic vegetation is determined by applying the rapid test for hydrophytic vegetation (Indicator 1) or the dominance test (Indicator 2). Indicator 1 is met when all dominant species across all strata are OBL and/or FACW. Where the rapid test is not met, the dominance test is satisfied when more than 50 percent of the composition of the dominant species are rated OBL, FACW and/or FAC.

Indicators 1 and 2 are the first indicators that need to be considered, however some wetland plant communities may fail a test based only on dominant species. If the plant community fails the dominance test, but indicators of hydric soil and wetland hydrology are both present, WSP scientists use the prevalence index (indicator 3), or observations of plant morphological adaptations for life in wetlands (indicator 4), to determine if an area has hydrophytic vegetation. Vegetation of an area was determined to be non-hydrophytic when none of the indicators for hydrophytic vegetation were satisfied.

3.2.3 Soils

The NRCS National Technical Committee for Hydric Soils defines hydric soils as those that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

Prior to beginning field work, NRCS soil survey data were reviewed for soil mapping units and soil series listed as hydric soils or containing hydric components. To the extent possible, soils were observed to a depth of 20 inches below the soil surface; in instances where refusal was encountered before 20 inches, this was noted on field data sheets. Soils were examined in the field for hydric soil characteristics according to the guidelines in the *Regional Supplement*. A *Munsell Soil Color Chart* was used to identify the hue, value, and chroma of the soil matrix and redoximorphic features that may be present (Munsell Color Company, 2009).

3.3 Wetland Classification

Wetlands, streams, and other waters were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States*, commonly referred to as the Cowardin Classification System (Cowardin et al., 1979). The waters identified within the ESC were classified as palustrine systems.

[1] OBL: A plant that almost always occurs in wetlands, but rarely in uplands;
FACW: A plant that usually occurs in wetlands, but occasionally occurs in uplands;
FAC: A plant that commonly occurs in both wetland and uplands;
FACU: A plant that usually occurs in uplands, but occasionally occurs in wetlands; and
UPL: A plant that almost always occurs in uplands, but rarely occurs in wetlands.

3.4 Ohio Rapid Assessment Method v. 5.0

The OEPA Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM) was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v. 5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1"; 30 to 59.9 are "Category 2"; and 60 to 100 are "Category 3". Transitional zones exist between “Categories 1 and 2” from 30 to 34.9 and between “Categories 2 and 3” from 60 to 64.9. However, according to the OEPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001).

3.5 Stream and River Crossings

The Clean Water Act (CWA) provides authority for states to issue water quality standards and designated uses to authorize certain activities in WoUS upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). The OHWM is defined in the USACE *Regulatory Guidance Letter No. 05*-05 (USACE, 2005). Generally, the OHWM is identified by a clearly defined, natural line along the stream bank created by fluctuations and flow of water; this may include changes in contours, substrate, vegetation, and debris (USACE, 2005).

Stream assessments were conducted using the methods described in the OEPA’s Methods for Assessing Habitat in Flowing Waters: Using OEPA’s *Qualitative Habitat Evaluation Index* (Rankin, 2006) and *Field Evaluation Manual for Ohio’s Primary Headwater Habitat Streams, Version 3* (OEPA, 2012).

3.5.1 OEPA Qualitative Habitat Evaluation Index

The Qualitative Habitat Evaluation Index (QHEI) stream assessment method is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and which are generally important to other aquatic life (*e.g.*, macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive quantitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey

general stream habitat quality to the regulated public, the OEPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 square miles) versus larger streams (L are those with a watershed area greater than 20 square miles). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L).

3.5.2 OEPA Primary Headwater Habitat Evaluation Index

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The Headwater Habitat Evaluation Index (HHEI) is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a "defined bed and bank, with either continuous or periodically flowing water, with watershed area less than or equal to 1.0 mi^2 (259 ha), ***and*** a maximum depth of water pools equal to or less than 15.75 inches (40 cm)" (OEPA, 2012).

The HHEI method is used to discern the actual and expected biological conditions in primary headwater streams. The statewide sampling effort by the OEPA revealed there are three general types of PHWH streams based upon the biological communities present. The three general PHWH stream types are:

Ephemeral Aquatic Streams: Ephemeral aquatic streams have limited or no aquatic life potential, except seasonally when flowing water is present for short time periods following precipitation or snow melt.

Small Drainage Warm Water Streams: Small drainage warm water streams are normally intermittent, but some may have perennial flow derived from shallow groundwater in which case the ambient stream temperature remains relatively warm during summer and fluctuates a greater degree seasonally. These types of streams may exhibit moderately diverse communities of warm water adapted native fauna present either seasonally or year-round. Native fauna is characterized by species of vertebrates or benthic macroinvertebrates.

Spring Water Streams: For spring water streams the prevailing flow and temperature conditions of these streams are influenced by groundwater. They exhibit moderately diverse to highly diverse communities of cold water adapted native fauna present year-round.

4.0 RESULTS

The results presented in this report reflect the existing and reasonably foreseeable site conditions at the time of the environmental surveys. The results cannot apply to site changes occurring after the survey which WSP has not had the opportunity to review. During the course of any survey, site conditions may change over time due to human and/or natural causes; as such, the results presented in this report may be invalidated, either wholly or in part, by changes beyond the control of WSP.

WSP ecologists surveyed the Project on June 28 – 29, July 8, 2021, and February 14, 2022, by walking the approximately 330.4-acre ESC (Preferred Route 194.8 acres, and Alternate Route 146.7 acres) and evaluating for wetlands and other WoUS. Additional wetlands, streams, and ponds were previously delineated from past surveys of other transmission lines in the vicinity of the project, on January 28 – 30, 2020, February 19, and April 20, 2021. All features identified within the Preferred and Alternate Routes ESC are depicted on the Delineated Features Map (Figure 3, Appendix A).

4.1 Desktop Review

Results of the desktop review and details of the wetlands, streams, and ponds delineated within the ESC are provided in the following sections.

4.1.1 Soils Evaluation

According to the NRCS Soil Data for Franklin County, Ohio, there are thirty-two soil map units shown within the ESC, presented in Table 1, Appendix B and shown on Figure 2, Appendix A. Eight of the thirty-two soil map units are listed as Not Hydric (0-1%), twenty are listed as Predominately Non-Hydric (1-32%), and four are listed as Predominately Hydric (66-99%). The soils observed by WSP staff during the environmental surveys of the ESC were consistent with the NRCS soil survey mapping.

4.1.2 National Wetlands Inventory Map Review

National Wetlands Inventory (NWI) wetland boundaries are potential wetland areas identified from USFWS aerial photograph interpretation which typically were not field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. The USFWS indicates that NWI maps are not intended or designed for jurisdictional wetland identification or location. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. However, NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions using USGS topographic maps.

According to the NWI maps of the Reynoldsburg and Southeast Columbus quadrangle boundaries, the ESC contains twenty-three mapped NWI features. Table 4-1 provides an overview of the identified NWI feature within the ESC, including NWI code, map page, and delineated resources associated with the NWI feature. Locations of the NWI mapped wetlands within and adjacent to

the ESC are shown on Figure 2, Appendix A. Associated delineated resources are discussed in more detail in Section 4.2.

Table 4-1: NWI Summary Table Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project			
NWI Code	**NWI Description**	**Map Page**	**Associated Delineated Resource**
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 1 of 28	Pond GS-12
PEM1F	Palustrine Emergent, Persistent, Semipermanently Flooded	Page 3 - 4 of 28	Wetland GS-01 (PEM/PFO)
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Pages 4 - 5 of 28	Pond GS-01
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Pages 5 - 7 of 28	Stream GS-01 (Mason Run) - Perennial
PEM1C	Palustrine Emergent, Persistent, Seasonally Flooded	Pages 5 - 6 of 28	Wetland GS-02 (PEM/PSS)
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Pages 6 - 7 of 28	Pond GS-02
R2UBH	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded	Pages 8 - 9, 26, and 28 of 28	Stream GS-03 (Big Walnut Creek) – Perennial, Stream GS-05 (Big Walnut Creek) – Perennial
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Pages 9 - 10 of 28	Pond GS-03, Wetland GS-06 (PSS)
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Pages 12 and 18 of 28	Stream GS-04 (Blacklick Creek) – Perennial, Stream AS-07 (Blacklick Creek) – Perennial
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 13 of 28	Pond GS-04
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 13 of 28	Pond GS-05
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 14 of 28	Pond GS-06
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 14 of 28	Pond GS-07
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 14 of 28	Pond GS-08
PEM1A	Palustrine Emergent, Persistent, Temporarily Flooded	Page 16 of 28	Wetland GS-07 (PEM)
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 18 of 28	Basin AS-01
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Pages 19 – 22 of 28	Stream AS-6 (UNT to Blacklick Creek) – Perennial, Stream AS-8 (UNT to Blacklick Creek) – Perennial

Table 4-1: NWI Summary Table Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project			
PEM1F	Palustrine Emergent, Persistent, Semipermanently Flooded	Pages 19 - 20 of 28	No Identified Resource
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 23 of 28	Pond GS-09
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Pages 23 - 24 of 28	Wetland GS-08 (PEM)
R2UBH	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded	Page 24 of 28	No Identified Resource
PUBGx	Palustrine Unconsolidated Bottom, Excavated	Page 26 of 28	Pond GS-10, Wetland GS-11 (PFO)
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Page 28 of 28	Stream GR-01 (UNT to Big Walnut Creek) – Perennial

4.2 Delineated Wetlands

During June 28 – 29, July 8, 2021, and February 14, 2022, environmental surveys the previous environmental surveys on January 28 – 30, February 19, and April 20, 2021 of the approximately 330.4-acre ESC (Preferred Route 194.8 acres, and Alternate Route 148.7 acres), WSP ecologists identified 16 wetlands totaling 5.04 acres. These wetlands range in size from 0.05 to 1.26 acres and are depicted on Figure 3. The reported wetland acreage only corresponds to areas delineated within the ESC as most wetlands extended beyond the survey boundary. Of the 16 delineated wetlands, seven were identified as Palustrine Emergent (PEM) wetlands, three were identified as Palustrine Forested (PFO) wetlands, two were identified as Palustrine Scrub-Shrub (PSS) wetlands, and four were identified as wetland complexes, containing mosaics of PEM, PFO, PSS, and/or Palustrine Unconsolidated Bottom (PUB) wetland communities. Twelve of the 16 delineated wetlands appear to be hydrologically connected to surface waters that are tributaries to the Scioto River, and therefore will likely be considered jurisdictional by the USACE. All identified wetlands from both surveys are shown on Figure 3, Appendix A.

Table 4-2 provides a summary of wetland identified within the ESC. Table 2, Appendix B provides specific wetland habitat types, acreages within the ESC, ORAM score and category, as well as information regarding jurisdictional status.

Six wetlands (Wetlands GS-01, GS-07, GS-13, SS-01, AS-02, and AS-03) identified as Category 1 wetlands, six wetlands were identified as Modified Category 2 wetlands (GS-02, GS-03, GS-05, GS-08, GS-09, and GS-14), three wetlands were identified as Category 2 wetlands (GS-10, GS-11, and GS-12), four wetlands (GS-02, GS-08, GS-09, GS-14), and one wetland (Wetlands GS-6) fell within the Category 1 – 2 Grey Zone. No Category 3 wetlands were identified within the ESC. Classification of wetlands was based on ORAM scores.

Completed USACE wetland determination forms are provided in Appendix C, for areas assessed for wetland indicators. Completed OEPA ORAM Wetland Data Forms are included in Appendix

D. Representative photographs were taken of each wetland during the field survey and are provided in Appendix F.

Table 4-2: Wetland Summary Table Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project							
Wetland Type	**ORAM Category**					**Number of Wetlands**	**Acreage within ESC[1]**
	Category 1	**Category 1 – 2 Grey Zone**	**Category 2**	**Modified Category 2**	**Category 3**		
PEM	4	0	1	2	0	7	1.32
PFO	0	0	2	1	0	3	0.15
PSS	1	1	0	0	0	2	1.42
PEM/PSS	0	0	0	1	0	1	1.26
PEM/PUB	0	0	0	1	0	1	0.07
PEM/PFO	1	0	0	1	0	2	0.82
Totals	**6**	**1**	**3**	**6**	**0**	**16**	**5.04**

[1]This acreage only corresponds to the area delineated within the 330.4-acre ESC.

4.3 Streams and Rivers

A total of ten streams, totaling approximately 4,621 linear feet, were identified within the ESC during the June 28 – 29, July 7, 2021, and February 14, 2022 field investigations and the previous environmental surveys on January 28 – 30, February 19, 2020, and April 20, 2021 as shown in Figure 3, Appendix A. Nine streams were identified as perennial and were actively flowing during the field investigations. Of the nine perennial streams, one was assessed using the HHEI methodology (drainage area less than 1 mi^2), three streams were assessed using the QHEI methodology (drainage area greater than 1 mi^2), and the remaining five perennial streams were not assessed using the QHEI or HHEI methodology, due to the fact that these streams have existing Aquatic Life Use Designations of Warm Water Habitat (WWH) by OEPA. One stream was identified as intermittent as was assessed using the HHEI methodology. All identified streams appear to have significant nexus with a TNW and are therefore likely to be considered jurisdictional by the USACE. It is noted that the USACE will make the final determination of hydrologically connected with a TNW.

Four of the ten identified streams, (Streams GS-03, GS-05, GS-06, and GR-01) lie within a watershed designated as "ineligible" for the OEPA Section 401 Water Quality Certification (WQC) for the USACE 2017 Nationwide Permits (NWPs). Two streams (GS-01 and GS-02) lie partially within both 'possibly eligible' and 'ineligible' watersheds. The remaining four streams (Streams GS-04, AS-06, AS-07, and AS-08) lie within watersheds designated as "possibly eligible". Streams within an "ineligible" area require an Individual Section 401 permit or director's authorization from the OEPA prior to in-water construction activities. For streams located in a "possibly eligible" watersheds, coverage under the OEPA WQC for the NWPs is determined

according to the NWP Eligibility Flow Charts found Appendix C of the Nationwide Permits for the State of Ohio.

In addition to the jurisdictional streams identified, all swales, ditches, and other surface drainages within the study area were also evaluated for consideration as jurisdictional Waters of the U.S. with respect to the Clean Water Act. Jurisdictional ditches must meet the definition of tributary, have an OHWM, and flow directly or indirectly through another water to a TNW. Multiple roadside ditches and swales were observed throughout the study area, however, none of the identified ditches or drainages would be considered jurisdictional within the study area. These features were excavated in upland soils to convey upland drainage and had no defined bed and bank or flow regime to constitute a Waters of the U.S. designation. Locations of identified non-jurisdictional drainages identified within the ESC are shown in Figure 3, Appendix A.

Table 3, Appendix B provides the waterbody name, flow regime, stream length within the ESC, field evaluation method, and OEPA 401 Watershed eligibility, of each delineated stream. Completed QHEI and HHEI forms are provided in Appendix E. Representative photographs were taken of each stream during the field survey and are provided in Appendix F. Locations of streams identified within the ESC are shown in Figure 3, Appendix A.

4.3.1 QHEI Stream Results

Three streams (Streams AS-06, AS-08, and GR-01) totaling 1,744 linear feet within the ESC were evaluated using the QHEI methodology. Streams AS-6 and AS-8 were identified as Fair Warmwater Habitats. Stream GR-01 was identified as Poor Warmwater Habitat. Details regarding individual streams are provided in Table 3, Appendix B.

4.3.2 HHEI Stream Results

Two streams (Streams GS-02 and GS-06) totaling 243 linear feet within the ESC were evaluated using the HHEI methodology. Both streams were identified as Small Drainage Warmwater Streams. Details regarding individual streams are provided in Table 3, Appendix B.

4.4 Ponds, Lakes, and Reservoirs

WSP ecologists delineated 17 ponds totaling 5.40 acres within the ESC during the June 28 – 29, July 7, 2021, and February 14, 2022 field investigations and the previous environmental surveys on January 28 – 30, and February 19, 2020, and April 20, 2021. The reported ponds acreage only corresponds to areas delineated within the ESC as the ponds extended beyond the survey boundary, in most cases. All identified ponds are considered non-jurisdictional as they are artificial (manmade) features constructed in an upland or non-jurisdictional waters. Locations of all delineated ponds identified within the ESC are shown in Figure 3, Appendix A. Table 4, Appendix B provides the name, coordinates, and acreage of each delineated pond.

4.5 Vegetative Communities

WSP ecologists conducted a general habitat survey in conjunction with the stream and wetland field surveys. Portions of the ESC were identified as agricultural land, scrub-shrub habitat, old field habitat, successional hardwood forest, landscaped areas, and urban land uses in addition to the identified ponds, streams, and wetlands. A variety of woody and herbaceous habitats, as

described below in Table 4-3, are present within the ESC. Habitat descriptions and details on anticipated impacts of construction are discussed in Section 4.5. Vegetated land cover can be seen visually from aerial photography provided in Figure 4, Appendix A.

Table 4-3: Vegetative Communities Within the ESC Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project			
Vegetative Community	**Description**	**Approximate Acreage Within the ESC**	**Approximate Percentage of ESC**
Agricultural Land	Agricultural land primarily consisting of soybean and corn fields were present within the ESC.	34.8	10.53%
Urban	These areas consist of developed residential, industrial, and commercial land uses, including roads, buildings, and parking lots. These areas are generally devoid of significant vegetation.	90.5	27.38%
Landscaped Areas	Developed areas, including residential and commercial properties, were observed within the ESC. These landscaped areas are frequently mowed or maintained grasses and forbs.	92.3	27.95%
Old Field	Herbaceous cover exists alongside roads, field borders, and abandoned fields within the ESC in the form of successional old-field communities. These communities are an early stage of succession following disturbance. This community type is generally short-lived, giving way progressively to shrub and forest communities unless periodically re-disturbed. Old field areas within the ESC are infrequently mowed areas of grasses, forbs, and occasional shrubs/saplings.	25.9	7.84%
Scrub/Shrub	Scrub/shrub habitats represent the successional stage between old field and second growth forest, and often emerge in recently harvested forests responding to the lack of overhead canopy.	19.3	5.83%
Successional Hardwood Woodland	Successional hardwood woodlands are present within the ESC. Dominant woody species within these areas include silver maple (*Acer saccharinum*), eastern cottonwood (*Populus deltoides*), and American sycamore (*Platanus occidentalis*), among others which were less prevalent.	52.7	15.97%
Ponds, Wetlands, and Streams	Palustrine Emergent (PEM) Wetlands within the ESC.	2.6	0.80%
	Palustrine Forested (PFO) Wetlands within the ESC.	1.9	0.57%
	Palustrine Scrub Shrub (PSS) Wetlands within the ESC.	0.4	0.14%
	Palustrine Unconsolidated Bottom (PUB) Wetlands within the ESC.	0.1	0.02%
	Stream areas within the ESC.	4.4	1.34%
	Ponds within the ESC.	5.3	1.62%
	Total	**330.4**	**100.0%**

4.6 Threatened and Endangered Species Coordination

WSP conducted a rare, threatened, and endangered species review for areas crossed by the ESC. The first phase of the evaluation involved a review of online lists of federal and state species of concern. In addition to the review of available literature, a request for Environmental Review was submitted to the Ohio Department of Natural Resources (ODNR). A coordination letter was also

submitted to the USFWS soliciting comments on the Project. A summary of the agency coordination is provided below. Correspondence from the USFWS and ODNR is provided in Appendix G. Table 5, Appendix B provides a list of species of concern identified in the vicinity of the ESC during the review.

4.6.1 USFWS Coordination

A request for review was submitted to the USFWS on August 17, 2021. In an email dated August 27, 2021 the USFWS provided comments on the Project with regard to federally-listed threatened and endangered species within the Project vicinity. The USFWS indicated that there are no federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of the Project. Comments from USFWS regarding protected species are provided in Table 5 (Appendix B).

4.6.2 ODNR Coordination

The ODNR Environmental Review, dated September 13, 2021 included comments from the Ohio Natural Heritage Database Program, Division of Wildlife (DOW), and Division of Water Resources. A review of Natural Heritage Database identified two (2) state-listed mussel species [Elktoe (*Alasmidonta marginata*) and Wavy-rayed lampmussel (*Lampsilis fasciola*)], one (1) state-listed fish specices [Tippecanoe darter (*Etheostoma tippecanoe*)] and four (4) managed areas [Pickerington Ponds Metro Park, Three Creeks Metro Park, Big Walnut Greenway, and Blacklick Creek Greenway Trail – Columbus & Franklin Co. Metro Parks] within a one-mile radius of the Project area. Additionally, the ranges of multiple species are known to occur within a one-mile radius of the ESA. Comments from ODNR regarding protected species are provided in Table 5 (Appendix B).

5.0 SUMMARY

WSP conducted environmental surveys of the Groves Road – Shannon 138 kV (Preferred and Alternate Routes) Transmission Line Project on June 28 – 29, July 7, 2021, and February 14, 2022. Additional areas from adjacent transmission lines that overlap the Project ESC were surveyed on January 28 – 29, February 19, and April 20, 2021. Sixteen wetlands, ten streams, and 17 open water features were identified within the approximately 330.4-acre ESC.

Sixteen wetlands, totaling 5.04 acres were identified within the ESC. Seven wetlands were classified as a PEM, three were classified as PFO, two were classified as PSS, and four were classified as wetland complexes containing mosaics of PEM, PFO, PSS, and/or PUB. Six of the 16 wetlands identified as Category 1 wetlands, five were identified as Category 2 wetlands, 4 were identified as Modified Category 2 wetlands, and one wetland scored within the Category 1 to 2 Grey Zone. No Category 3 wetlands were identified within the ESC. ORAM scores for the identified wetlands ranged from 12.5 to 56. Thirteen of the sixteen delineated wetlands appear to be hydrologically connected to surface waters that are tributaries of the Scioto River, which in turn flows into the Ohio River, a TNW. Therefore, these thirteen wetlands appear to be jurisdictional to the USACE.

Ten streams, totaling 4,621 linear feet, were identified within the approximately 330.4-acre ESC. Nine of the ten delineated streams were identified as perennial and were actively flowing, during the environment survey. The one remaining stream was identified as intermittent. Of the ten

delineated streams, two streams (Stream AS-06 and GR-01) were assessed using the QHEI methodology and three streams (Streams GS-02, GS-06, and AS-08) were assessed using the HHEI methodology. All streams were identified as tributaries to the Scioto River, which flows into the Ohio River, a Traditionally Navigable Waterway (TNW). Therefore, all ten identified streams appear to be jurisdictional to the USACE.

All ten delineated streams lie within a watersheds designated as either "ineligible" or "possibly eligible" for the OEPA Section 401 Water Quality Certification (WQC) for the USACE 2021 Nationwide Permits (NWPs). Impacts to streams in 'ineligible' watersheds require an Individual Section 401 permit or director's authorization from the OEPA prior to in-water construction activities, while impacts to streams located in "possibly eligible" watersheds, only require an Individual Section 401 permit or director's authorization if it is determined to be 'high-quality' according to the NWP Eligibility Flow Charts found Appendix C of the Nationwide Permits for the State of Ohio.

Additionally, 17 ponds totaling 5.4 acres were identified within the ESA. All identified ponds appear to be man-made open water features that were excavated in upland soils and primarily fed from stormwater runoff and sheet flow from adjacent areas. Therefore, are likely considered non-jurisdictional by the USACE.

The results discussed in this report are confined to the ESC limits described in earlier sections and depicted on Figure 3, Appendix A. Similarly, the data described is often for an area that is larger than the actual Project limits-of-disturbance for construction, therefore, lengths and acreages listed in the report are likely not representative of actual Project impacts which are often determined later after Project design and engineering is completed. If it is determined that this Project will impact Waters of the U.S., actual impacted lengths and acreages will be supplied in a permit application. Additionally, the results presented in this report should not be construed as a jurisdictional determination. If a jurisdictional determination is desired, one can be acquired through obtaining an approved Jurisdictional Determination (JD) or Preliminary Jurisdictional Determination (PJD) through the USACE.

Wetlands, excavated ponds, stream channels, and rivers are regulated by the USACE and OEPA. Any encroachments, fill material, or crossings of these areas will require permit authorization from the associated state and federal agencies. Should it be determined that the Project may impact potentially regulated waters, WSP can work to determine whether a JD or PJD is recommended, as well as support submittal for necessary permits.

Based on observations within the ESC during environmental surveys, USFWS comments, and ODNR comments, potential impacts to the Indiana bat and northern long-eared bat are not anticipated if the recommended seasonal clearing dates are utilized. Forested areas that typically provide potential summer roost habitat for bat species, are located within the ESC. Utilize recommended clearing window (October 1 through March 31), to avoid negative impacts to these species.

WSP performed a desktop review for potential hibernacula within the vicinity of the Project as a result of comments from ODNR relating to state- and federally-listed bat species. Topographic maps did not depict caves, cliffs/ledges, and subsurface mines within a three-mile radius of the

ESC. A review of aerial imagery also did not provide evidence of these habitat types. Documented mines or mine openings are not recorded within a three mile buffer of the Project Area. Additionally, no potential hibernacula were identified within the ESC during the field survey. Additional information pertaining to the state- and federally-listed bat species is provided in Table 5, Appendix A.

The ESC lies within the range of 15 state- and federally-listed freshwater mussel species (Table 5, Appendix A). Ohio Mussel Survey Protocol Group 2, 3, and 4 streams will require a mussel survey. Group 1 streams and unlisted streams with a watershed greater than five square miles should be assessed using a reconnaissance survey to determine the presence of freshwater mussels. Further mussel surveys may be recommended for Group 1 streams following completion of a reconnaissance effort. Requirements of freshwater mussel reconnaissance and survey efforts are explained in the Ohio Mussel Survey Protocol. If in-water work is planned in any stream with a watershed greater than five square miles at the point of impact, DOW recommends that information indicating that mussel impacts will not occur be provided. If this is not possible, the DOW recommends that a professional malacologist conduct survey and relocation efforts in accordance with the Ohio Mussel Survey Protocol.

DOW indicated that the ESC lies within the range of 11 state-listed fish species (Table 5, Appendix A). The DOW has recommended in-water work restriction dates from April 15th to June 30th in perennial streams in order to avoid impacts to these species.

DOW indicated that the ESC lies within the range of eight state- and/or federally-listed bird species. Based on the habitat requirements for each species, no suitable habitat was identified within the ESC, as it passes through predominately urban, commercial, and residential land uses, which are routinely disturbed and are not high-quality environments for the aforementioned protected species. Therefore, no adverse impacts to any of the state- and/or federally-listed bird species or their habitat is anticipated to occur.

6.0 REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C.

Harlow, William M. 1957. *Trees of the Eastern and Central United States and Canada*. Dover Publications, Inc. New York, NY.

Knobel, Edward. 1980. *Field Guide to the Grasses, Sedges and Rushes of the United States*. Dover Publications, Inc. New York, NY.

Environmental Laboratory. 1987. *U.S. Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station: Vicksburg, Mississippi.

Fretwell, Judy D., J. S. Williams, P. J. Redman. 1996. *United States Geological Survey National Water Summary on Wetland Resources.* USGS Water Supply Paper 2425. ISBN 0-607-85696-3.

Munsell Color Company. 2009. *Munsell Soil Color Book*. Grand Rapids Michigan.

NOAA. 2020. *Climate Data Online*. Available Online: https://www.ncdc.noaa.gov/cdo-web/. Accessed 5/7/2021.

OEPA. 2012. *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, Version 3.0*. Ohio EPA Division of Surface Water, Columbus, Ohio.

OEPA. 2020. *401 Water Quality Certification for Nationwide Permits*. Available online: 401 Water Quality Certification for Nationwide Permit Eligibility (arcgis.com) Accessed 7/20/2021.

ODNR. 2018. *Ohio Mussel Survey Protocol*.

Rankin. 2006. *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI)*. Ohio EPA Technical Bulletin EAS/2006-06-1.

USACE. 2005. *Regulatory Guidance Letter No. 05-05*.

USACE. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE. 2018. National Wetland Plant List (NWPL). Available online: http://wetland-plants.usace.army.mil/nwpl_static/v33/home/home.html. Accessed 7/8/2021

USDA, NRCS. 2020. *National Weather Service - Wetland Climate Evaluation Database*. Available online: https://www.wcc.nrcs.usda.gov/climate/navigate_wets.html (click on Ohio/Franklin County/Section II/Climatic Data/AgACIS/WETS and Frost/freeze dates), Accessed 7/20/2021.

USDA, NRCS. 2019. *Geospatial Data Gateway - Watershed Boundary Dataset*. Available online: https://datagateway.nrcs.usda.gov/. Accessed 7/20/2021.

USDA, NRCS. 2017. *Field Indicators of Hydric Soils in the United States, Version 8.1.* L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

USDA, NRCS. 2015b. *National Hydric Soils List (December 2015).* Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/, Accessed 7/20/21.

USDA, NRCS. Soil Survey Staff. Web Soil Survey. Available online at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

USFWS. 2018. *Ohio County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species*. Available online at: https://www.fws.gov/midwest/endangered/lists/cty_indx.html. Accessed 7/20/2021.

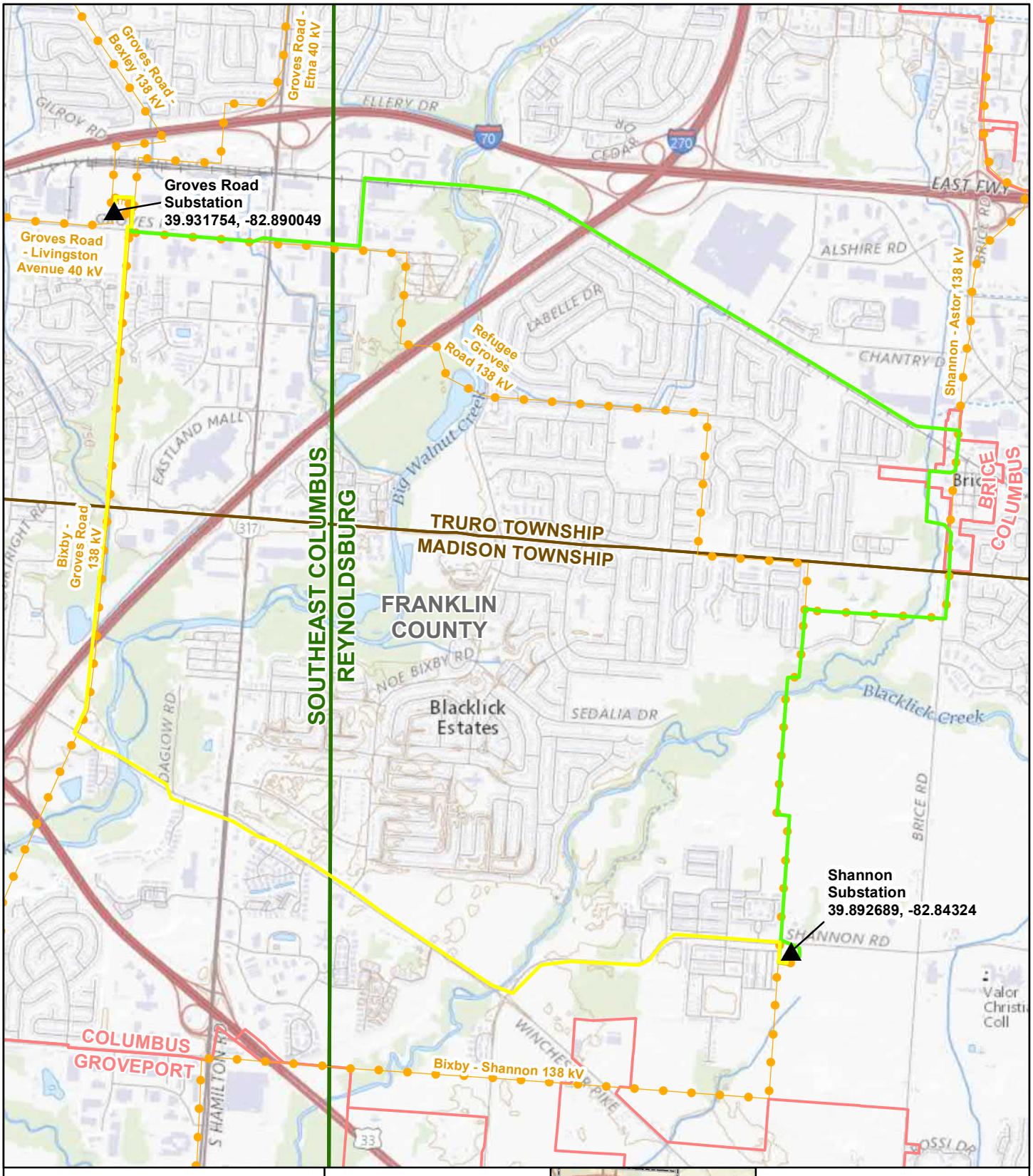
USFWS. 2019. *National Wetlands Inventory Map – Lockbourne, Ohio quadrangle*. Available online at: https://www.fws.gov/wetlands/data/mapper.html.

USGS. 2007. National Hydrography Dataset. Available at: http://nhd.usgs.gov/data.html.

Wetland Training Institute. 1995. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual, Wetland Training Institute, Glenwood, NM, USA.

Appendix A.

Figures



- Substation
- Alternate Route
- Preferred Route
- Existing Transmission Line
- USGS 24k Topo Quad Boundary
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Topo Quads (USGS 2013)

Coordinate System:
State Plane Ohio South
NAD 1983

January 12, 2022



Groves Road - Shannon 138 kV
Transmission Line Project

Figure 1. Project Location Map

0 0.25 0.5 Miles

N

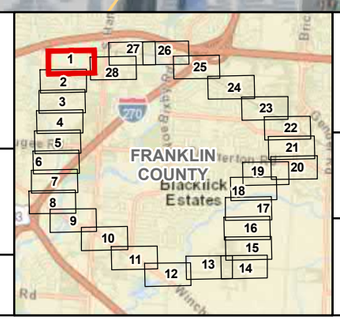


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

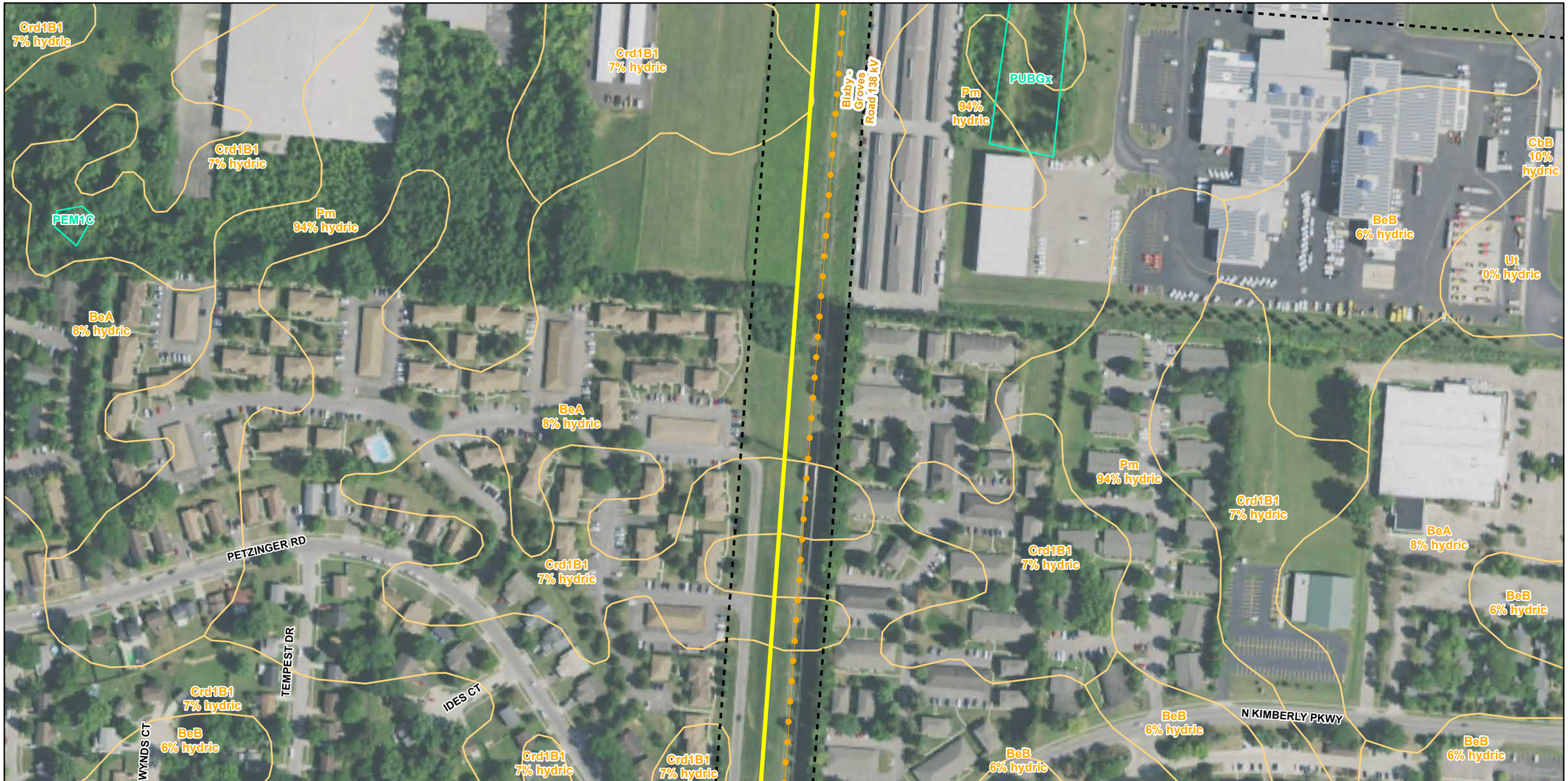
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

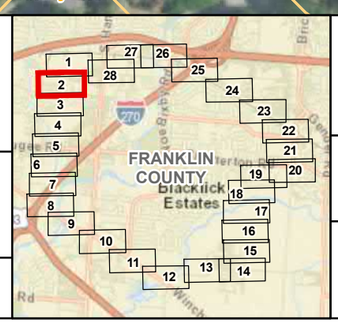


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

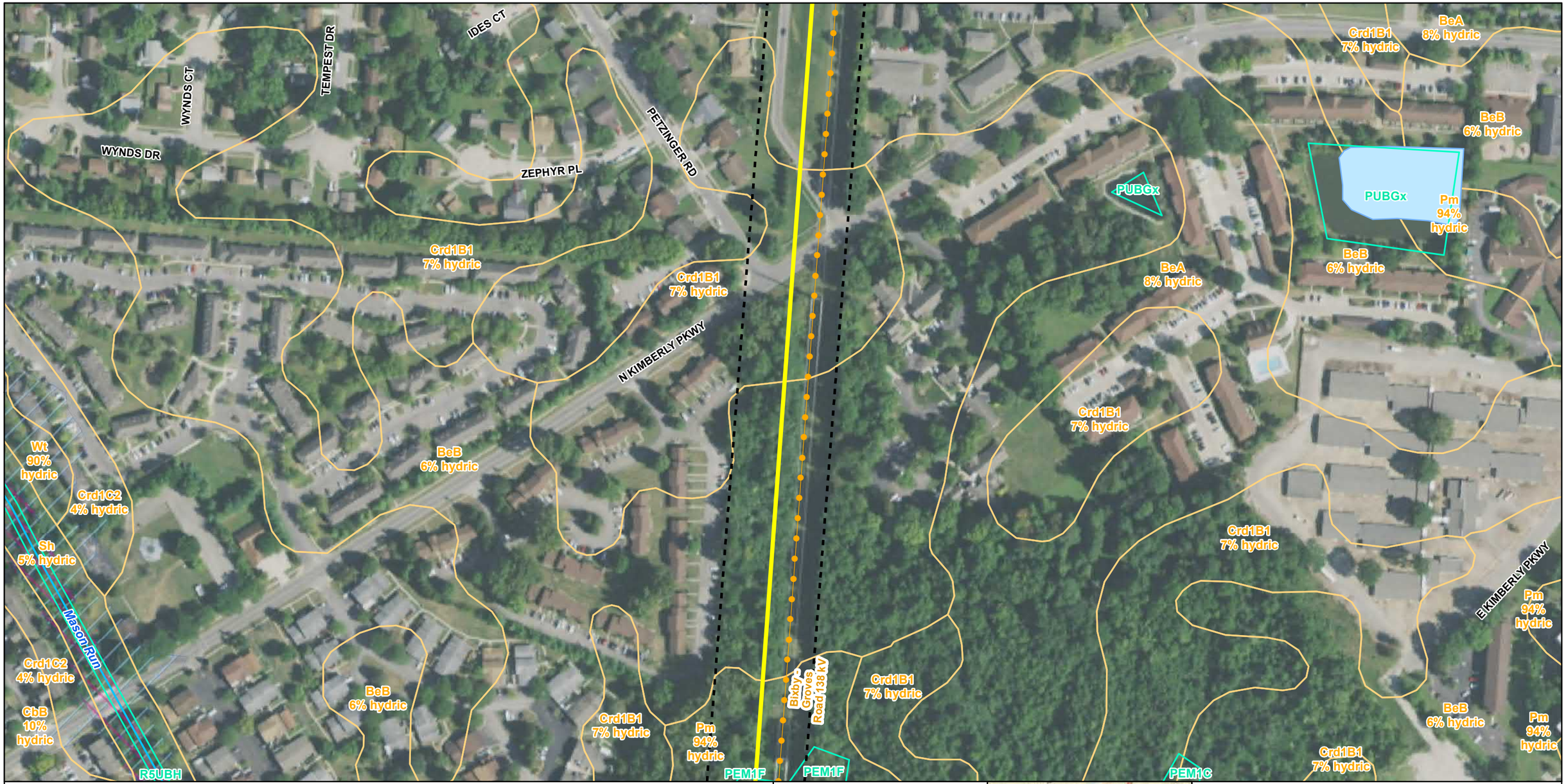
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

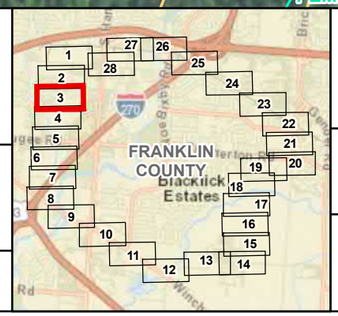


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

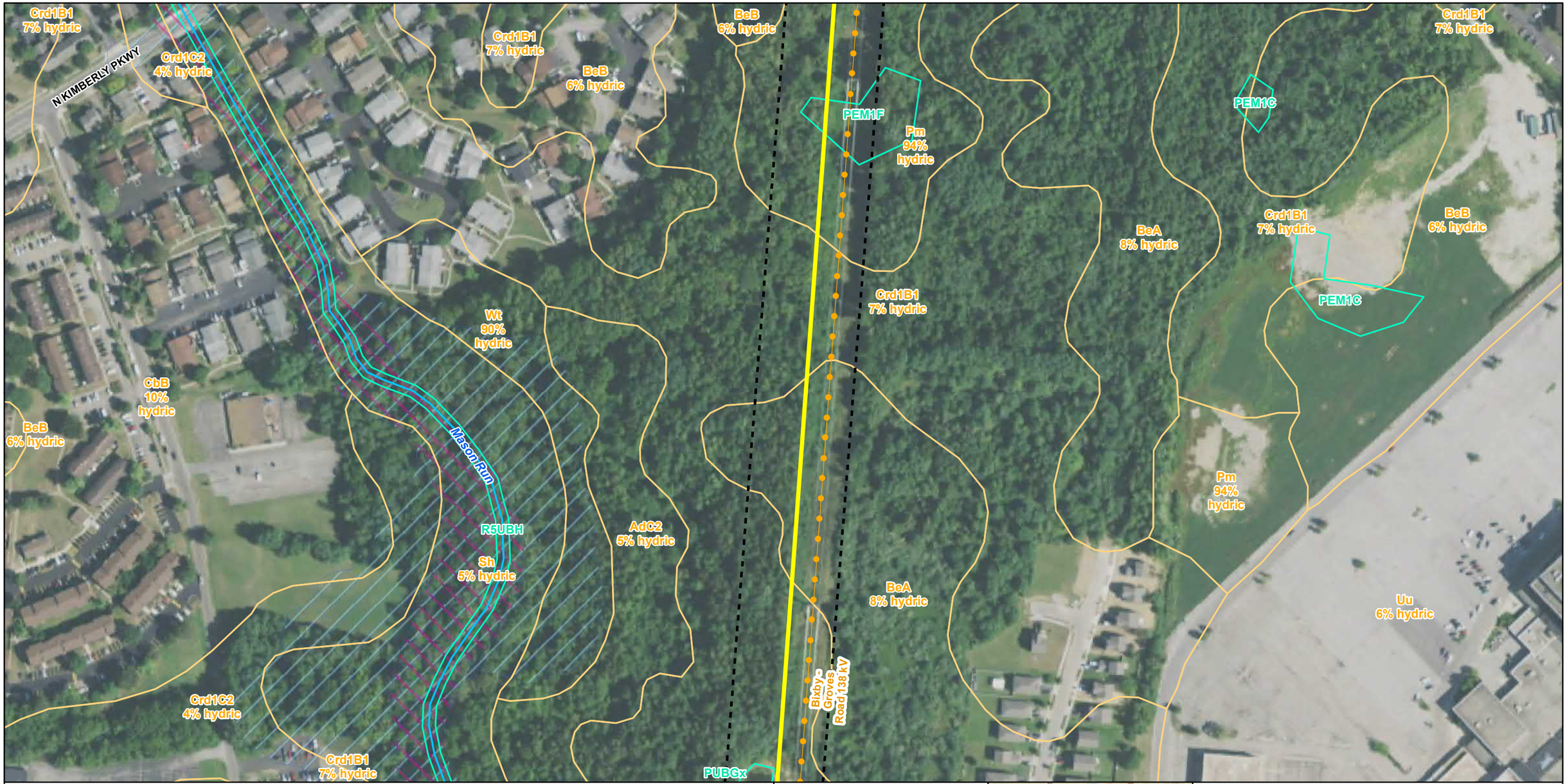
Figure 2. Environmental Basemap

AEP OHIO

WSP

N

0 200 400 Feet

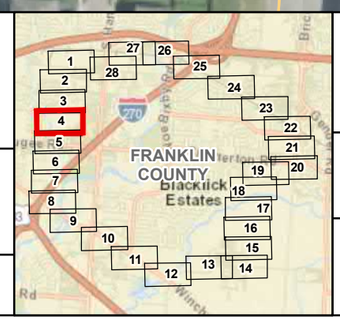


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

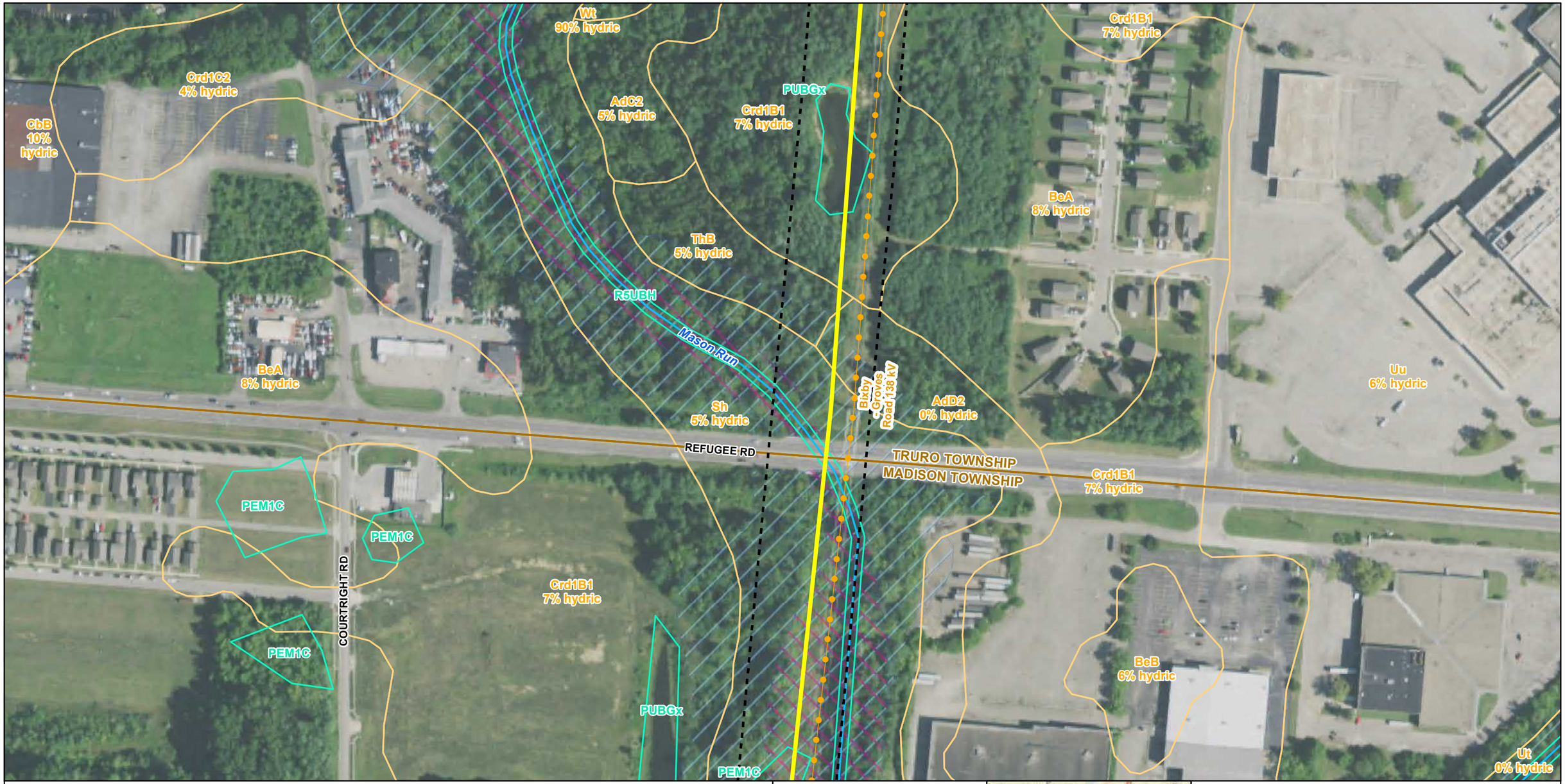
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

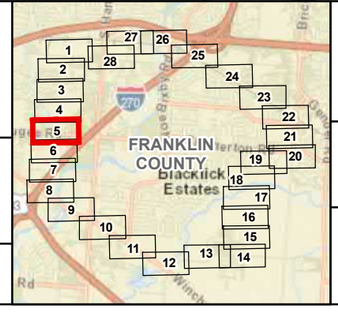


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

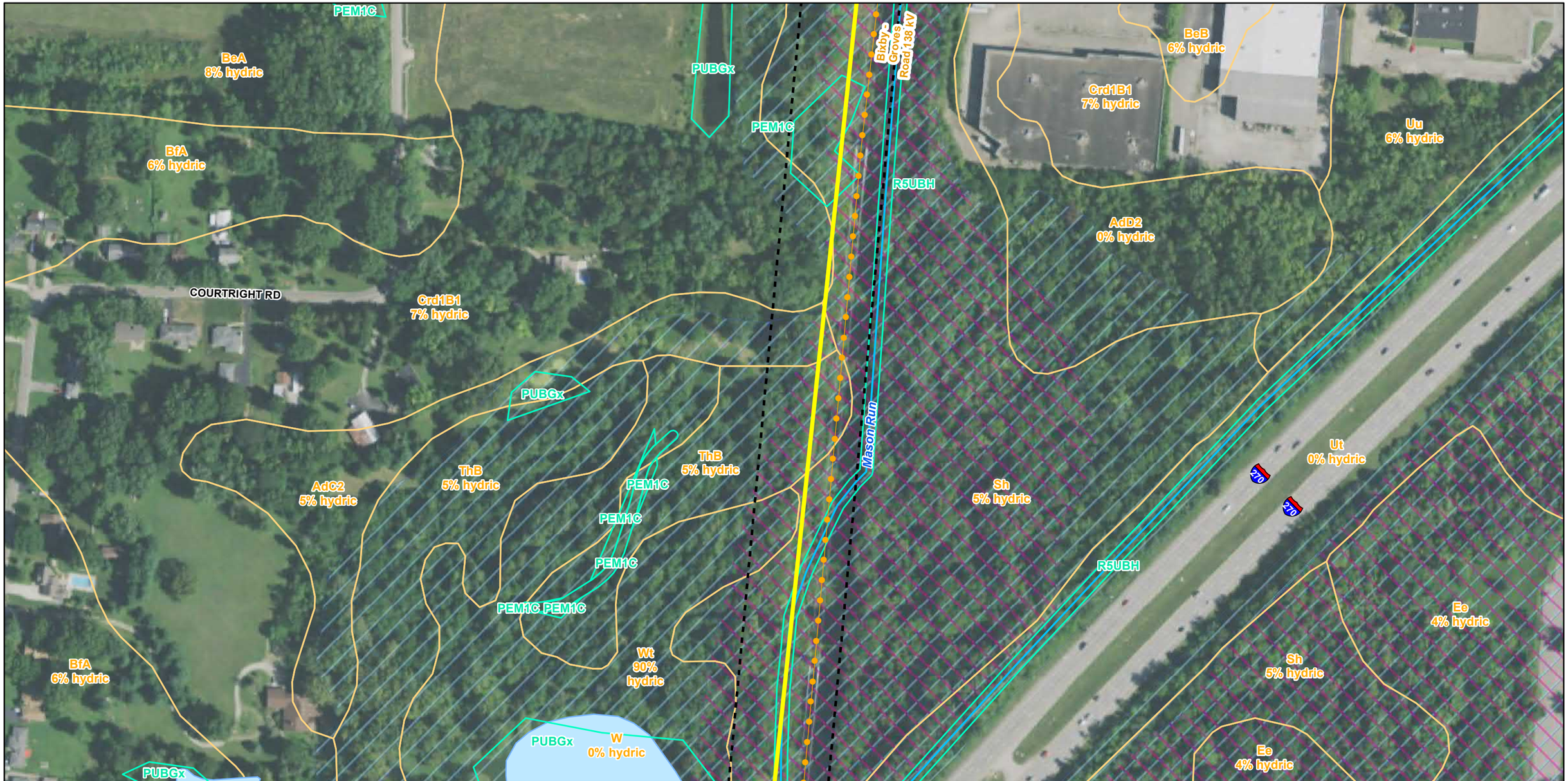


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

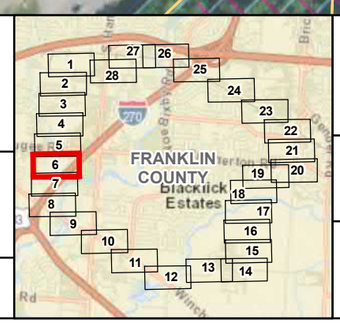


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

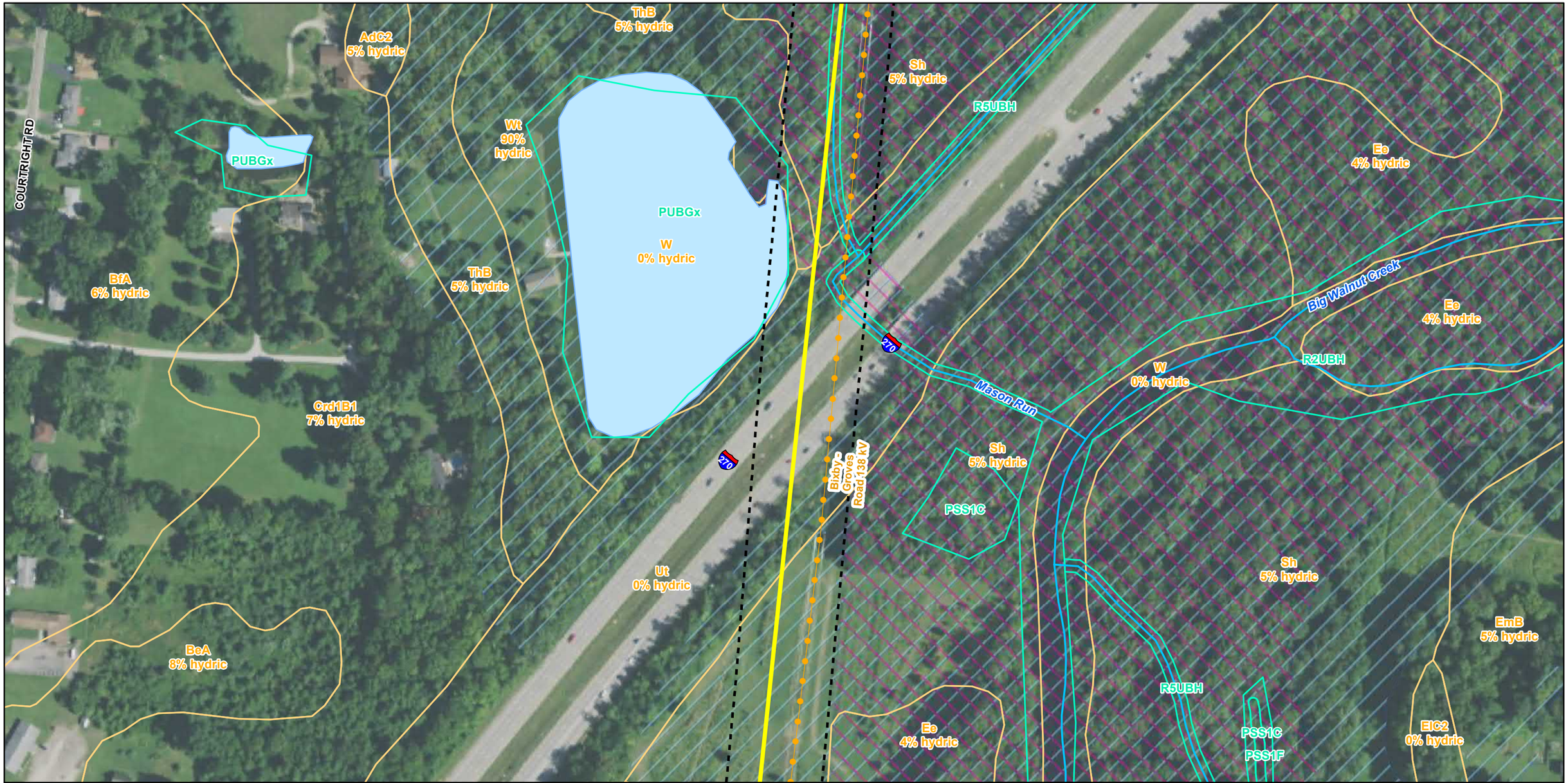


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

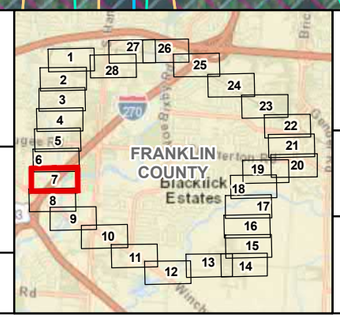


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

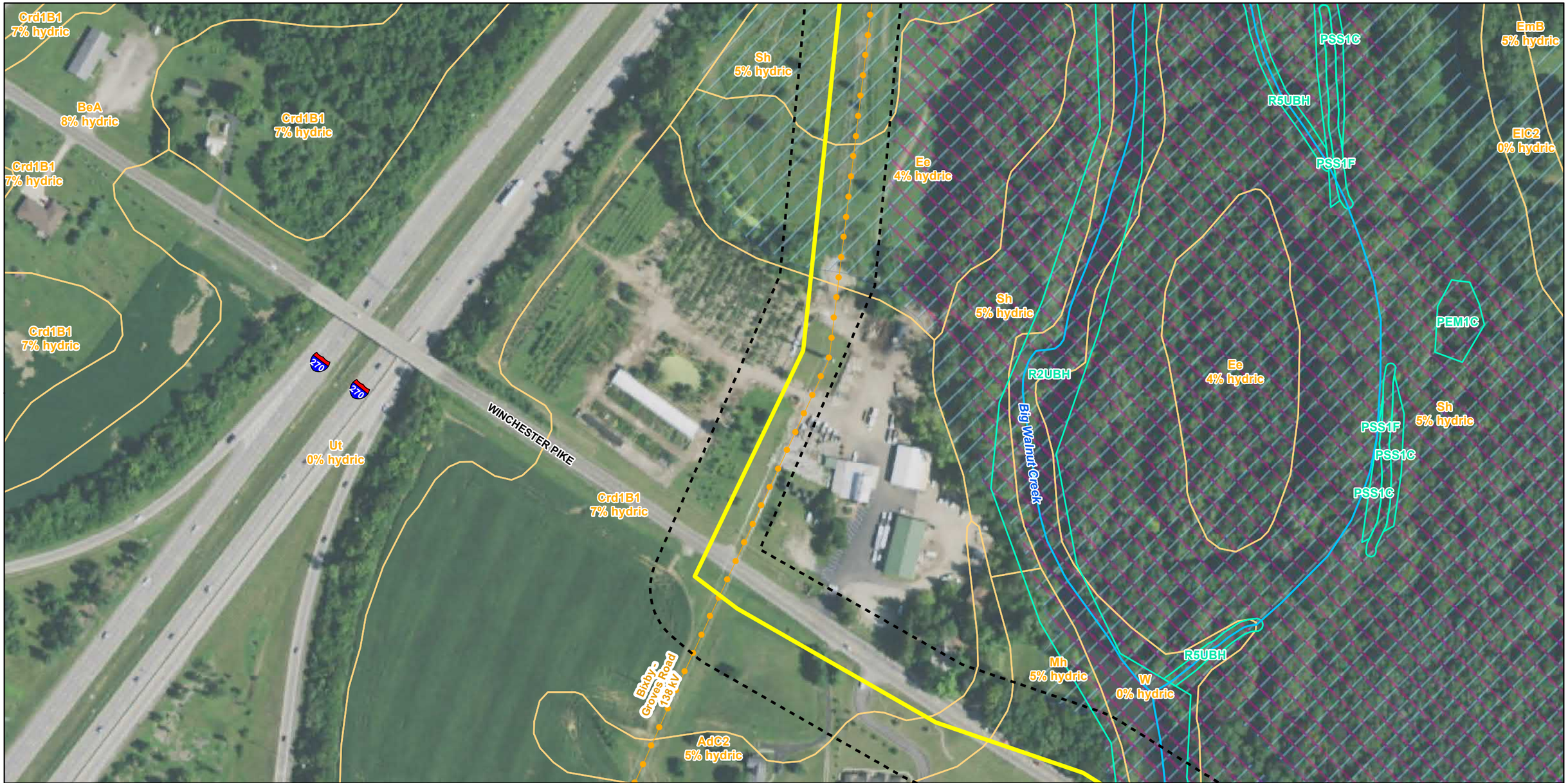


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

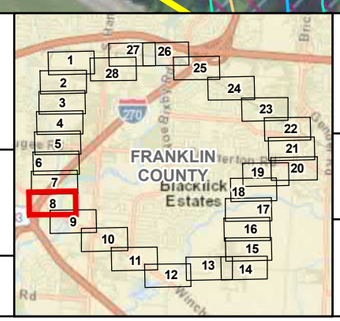


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

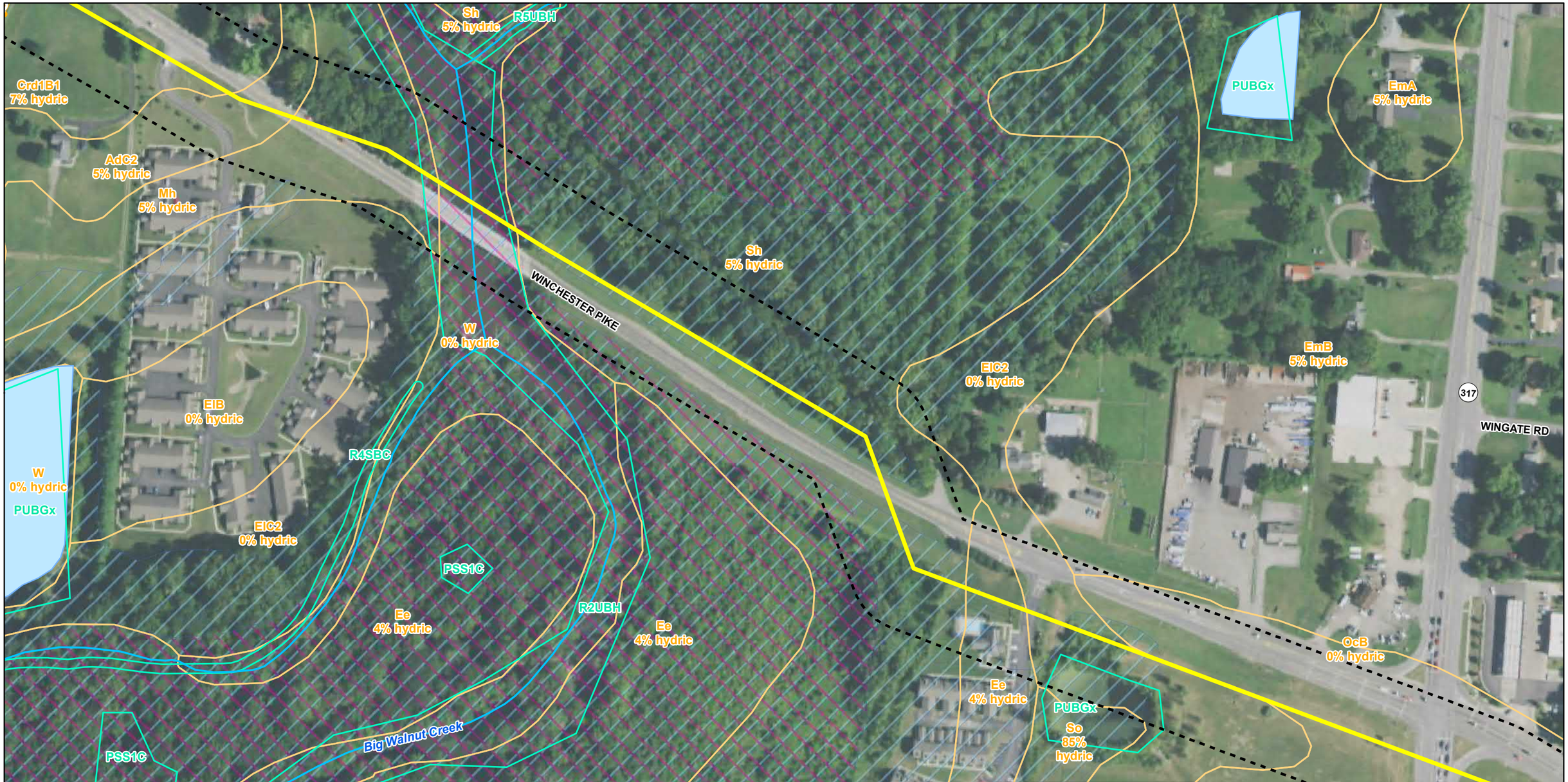
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

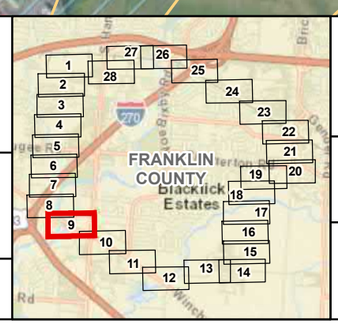


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

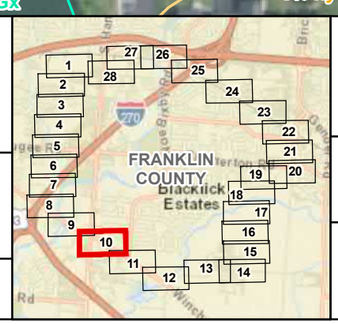


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

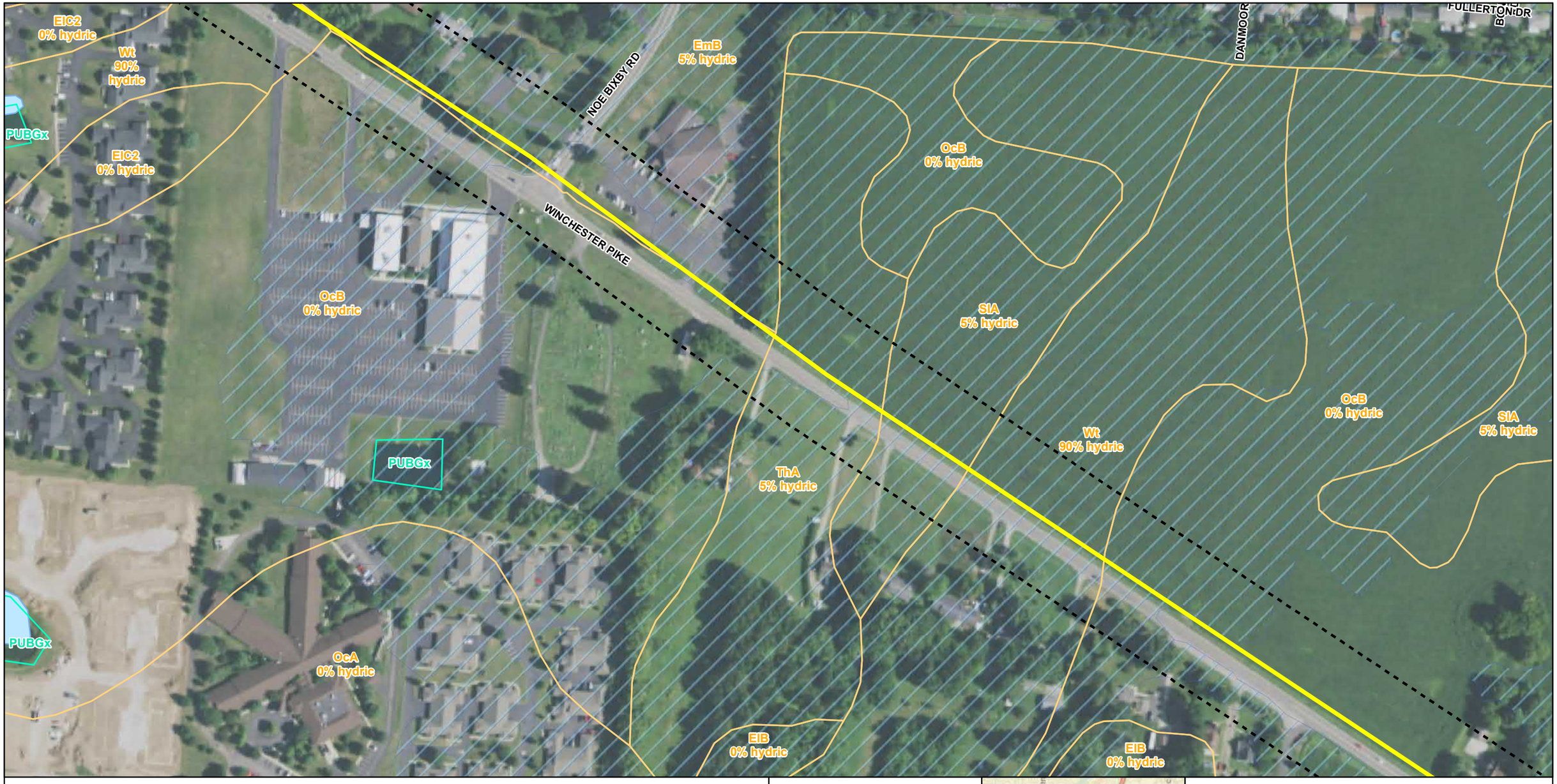


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet



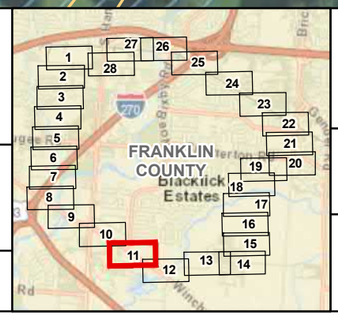
Substation
Alternate Route
Preferred Route
NHD Stream
Environmental Survey Corridor
NWI Wetlands
NHD Waterbody
Soil Map Unit

FEMA 100-Yr Floodplain
FEMA Floodway
Municipal Boundary
Township Boundary
County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

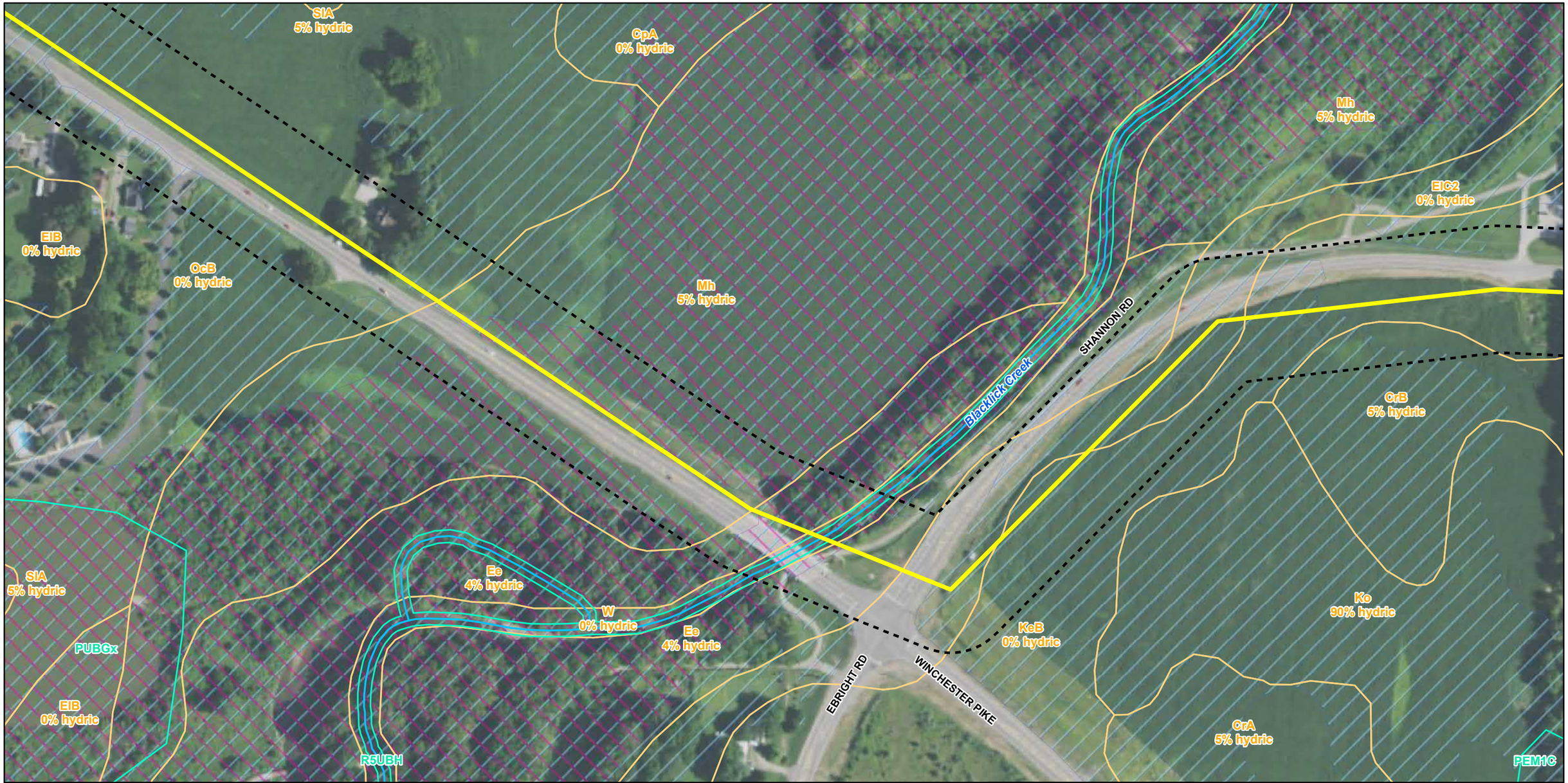
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

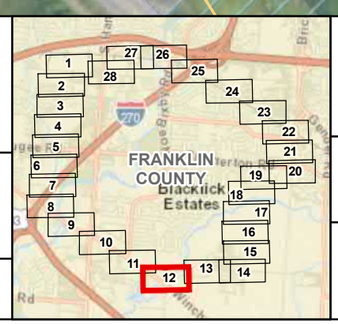


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

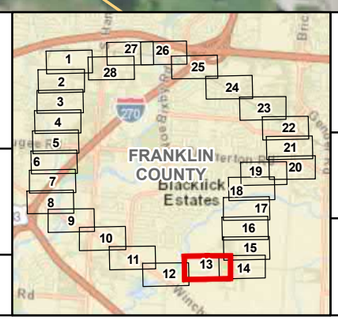


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

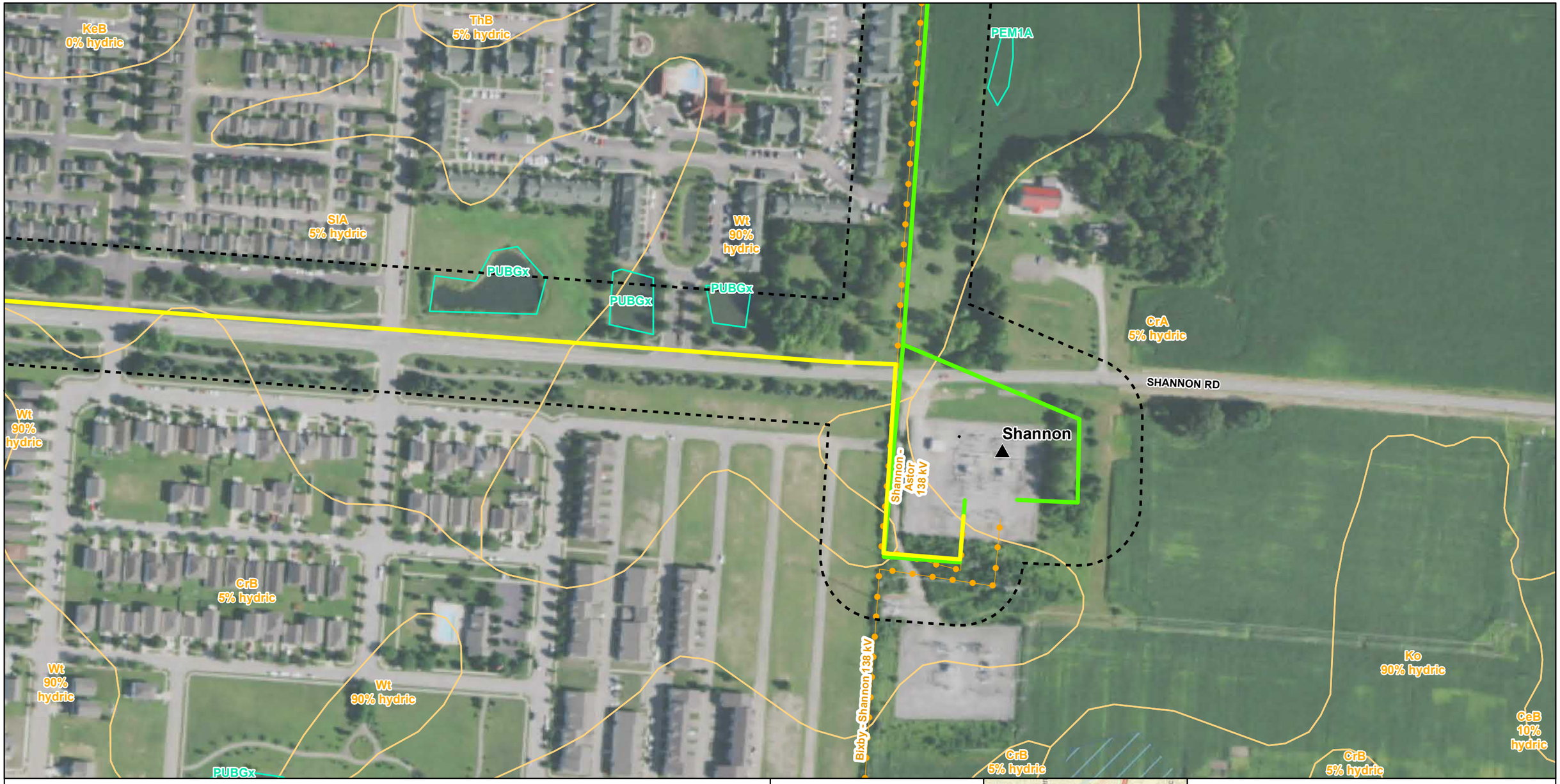
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

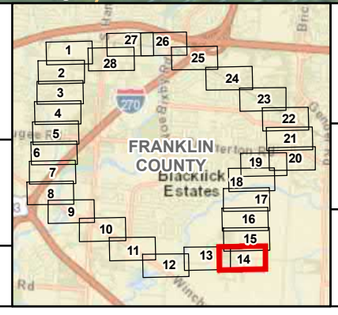


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

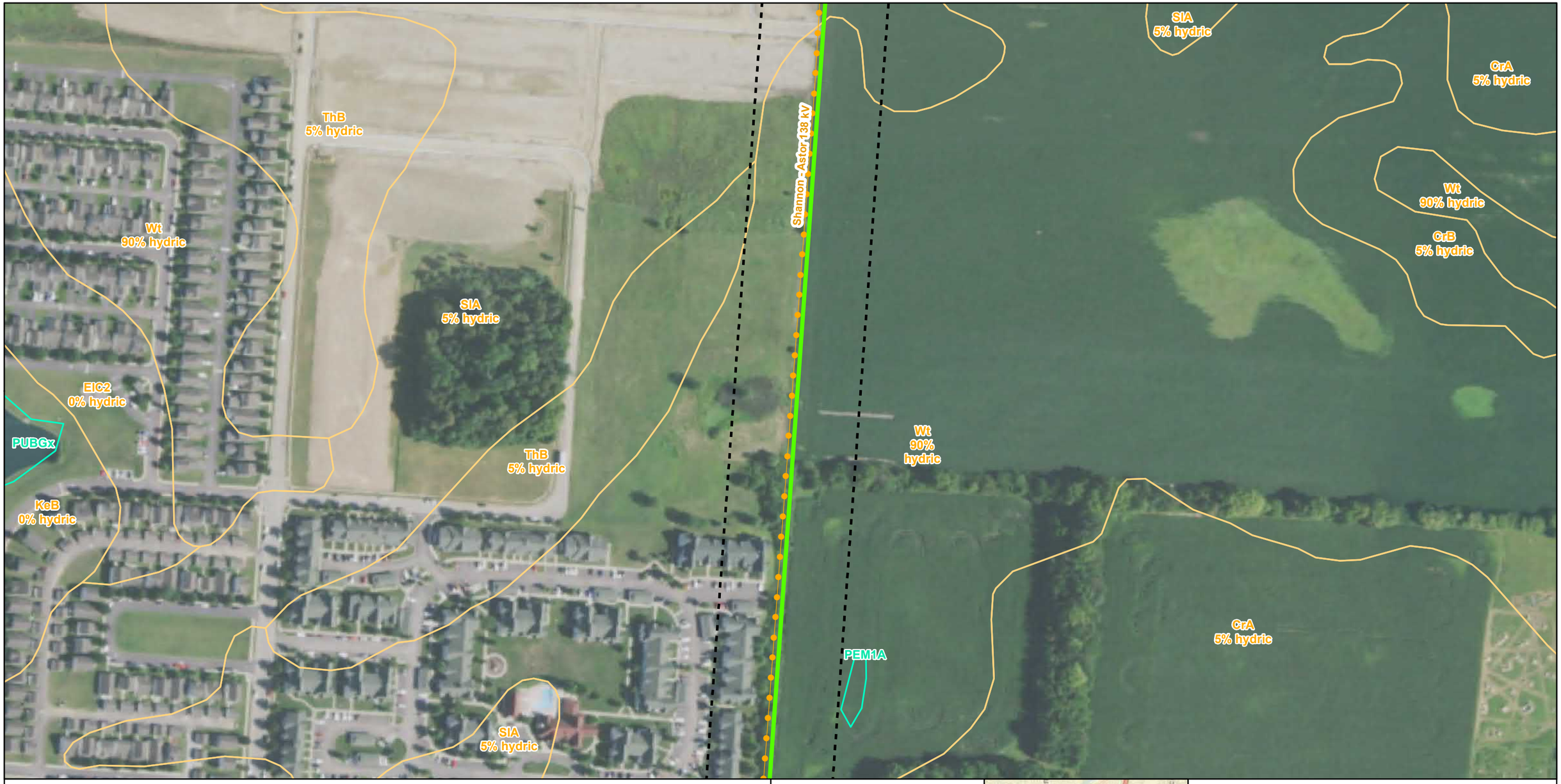


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

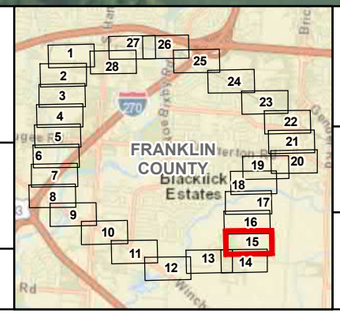


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

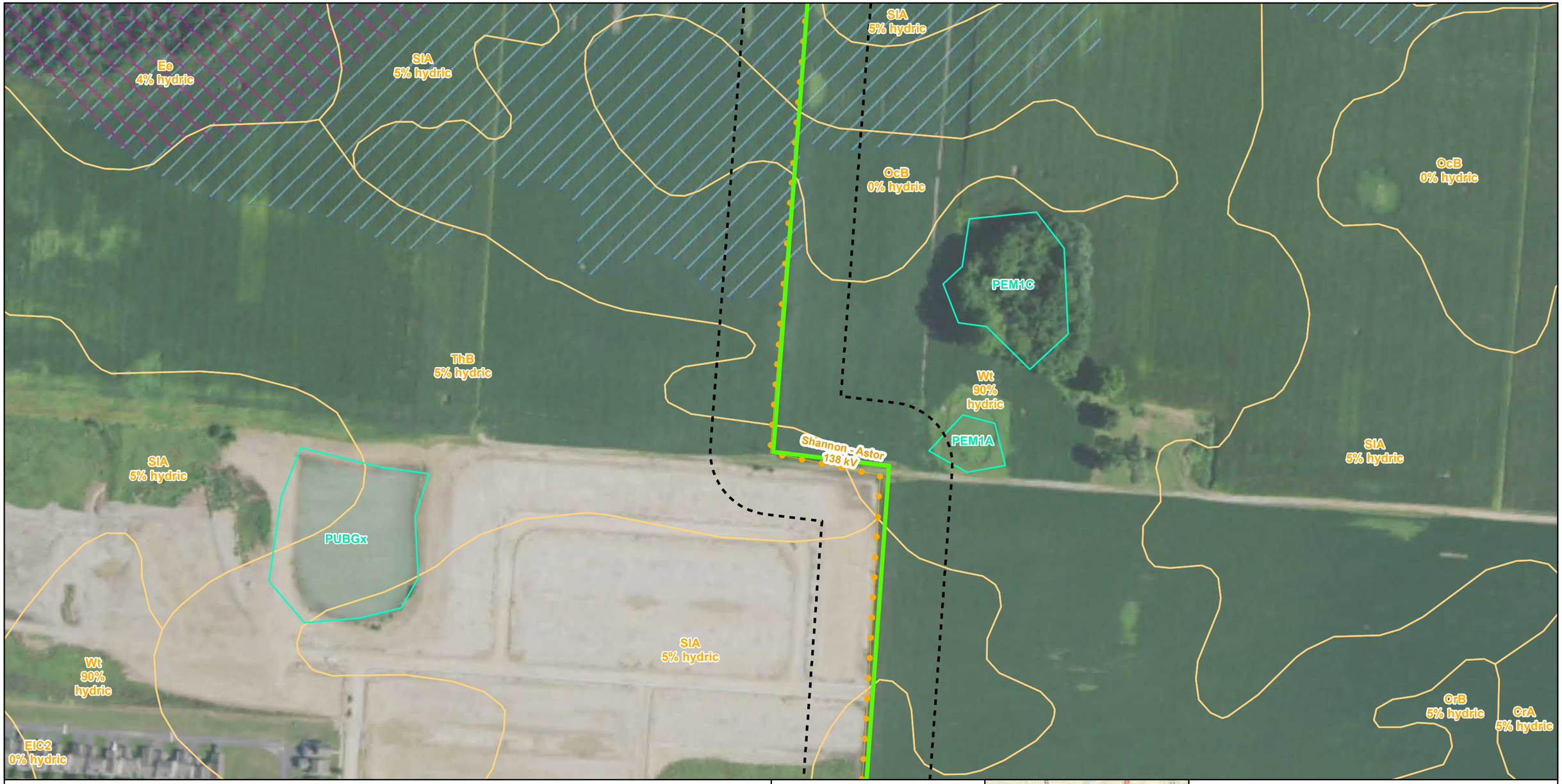
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

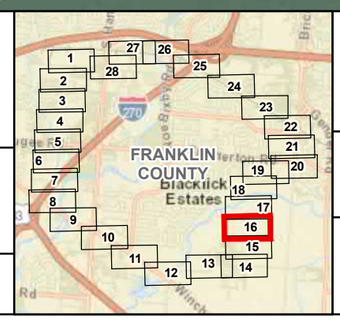


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

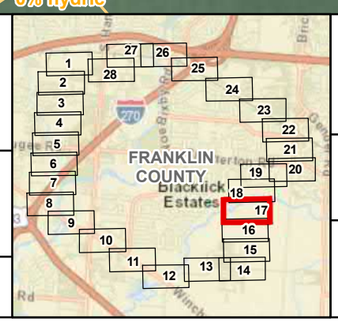


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

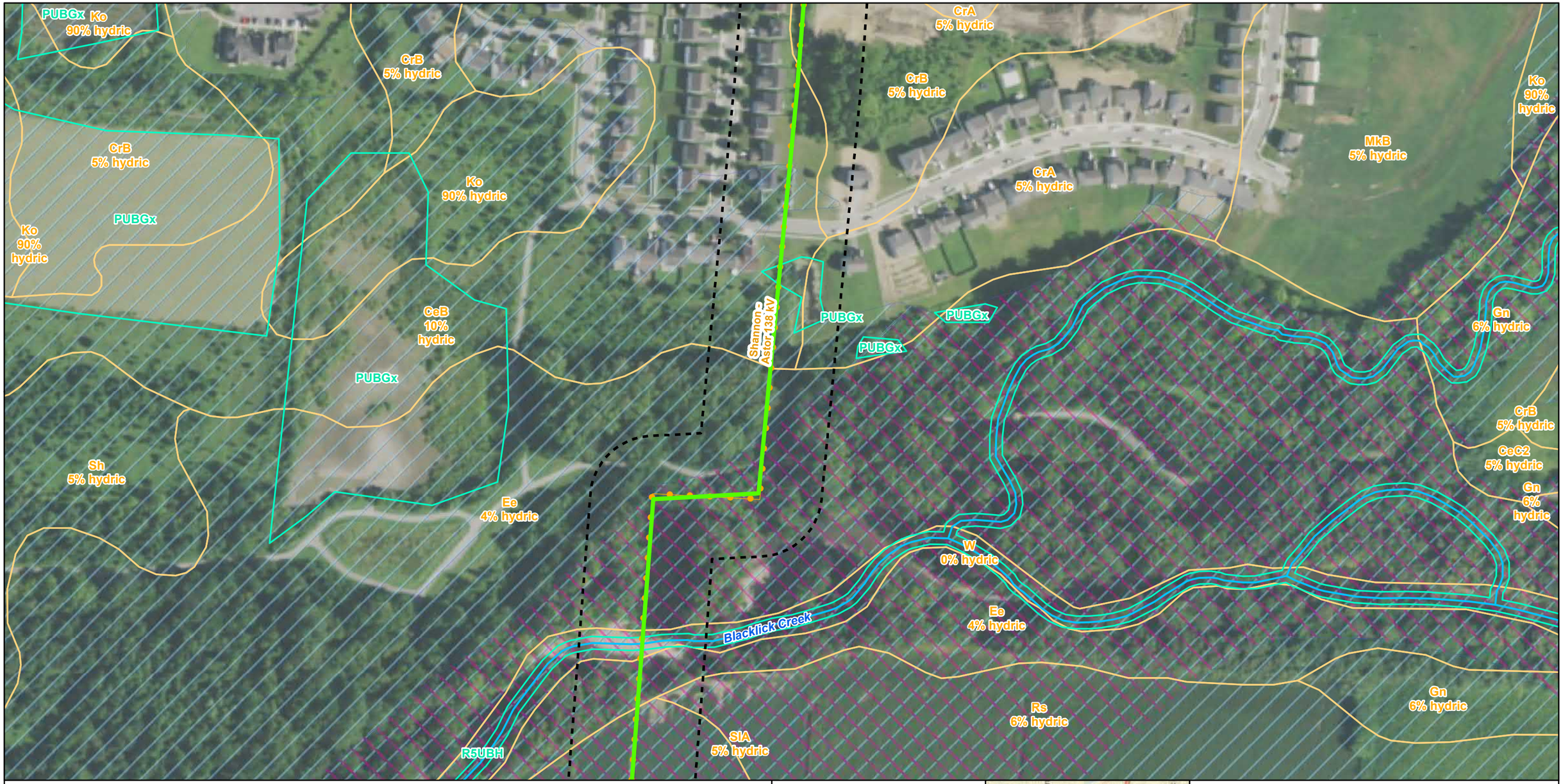
Figure 2. Environmental Basemap

AEP OHIO

WSP

N

0 200 400 Feet

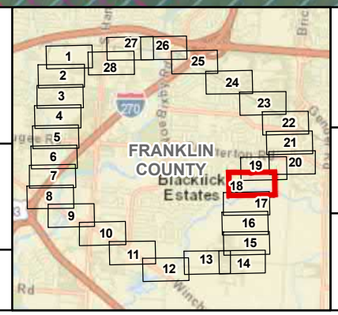


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

AEP OHIO

WSP

N

0 200 400 Feet

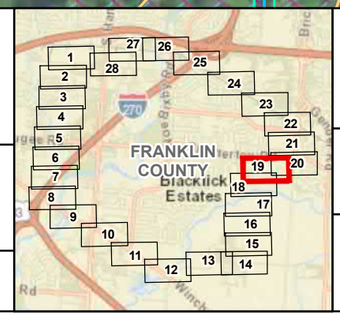


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

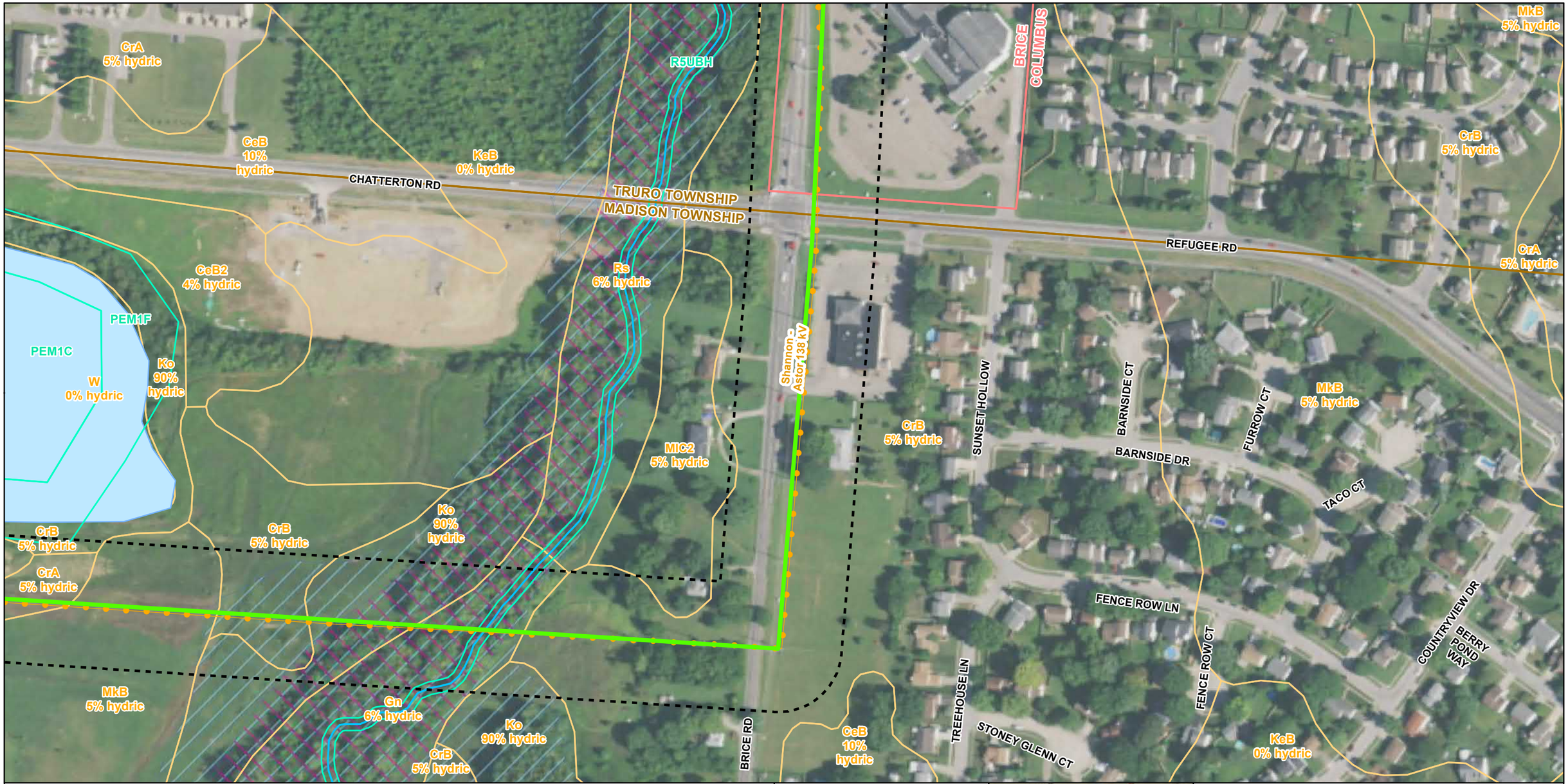
Figure 2. Environmental Basemap

AEP OHIO

WSP

N

0 200 400 Feet

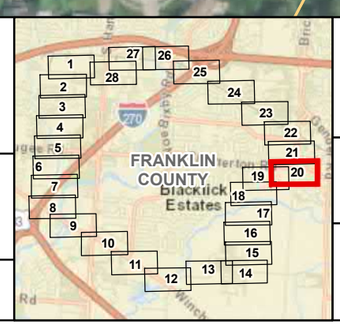


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

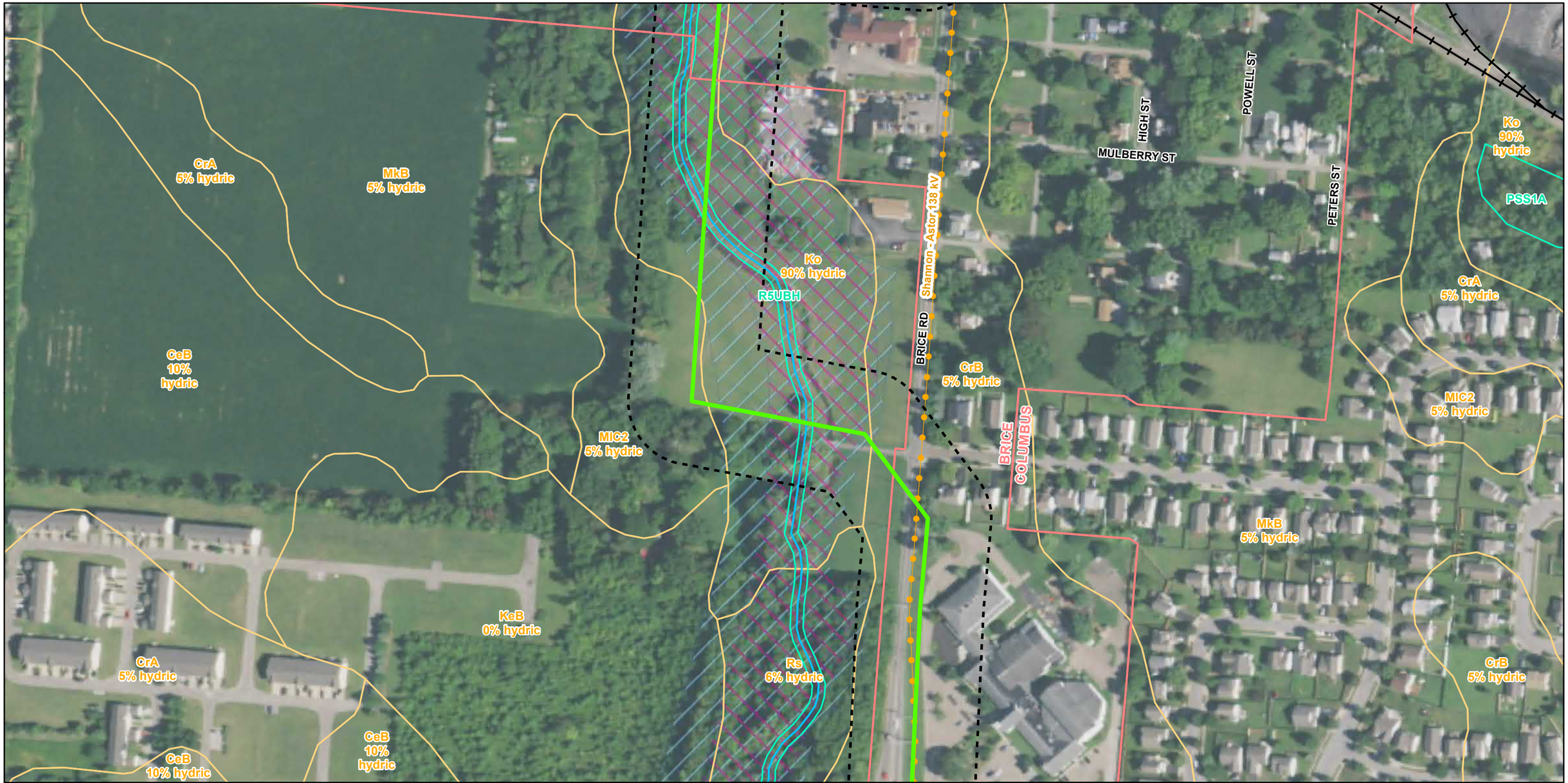


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

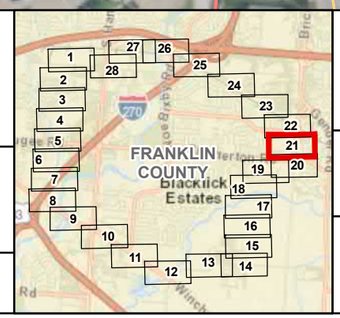


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

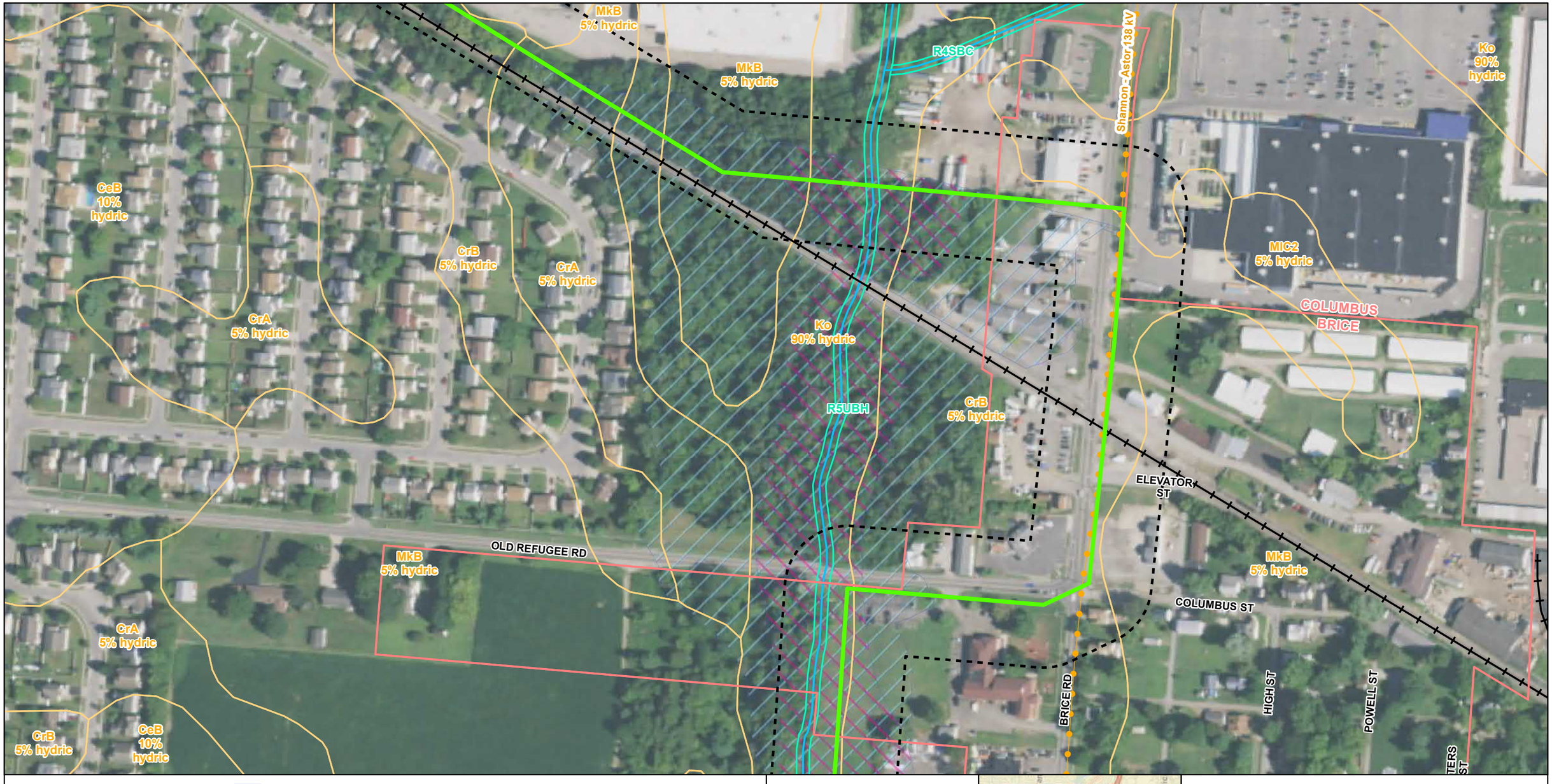
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

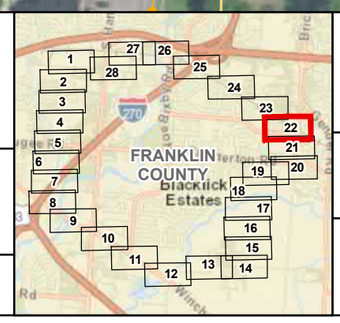


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

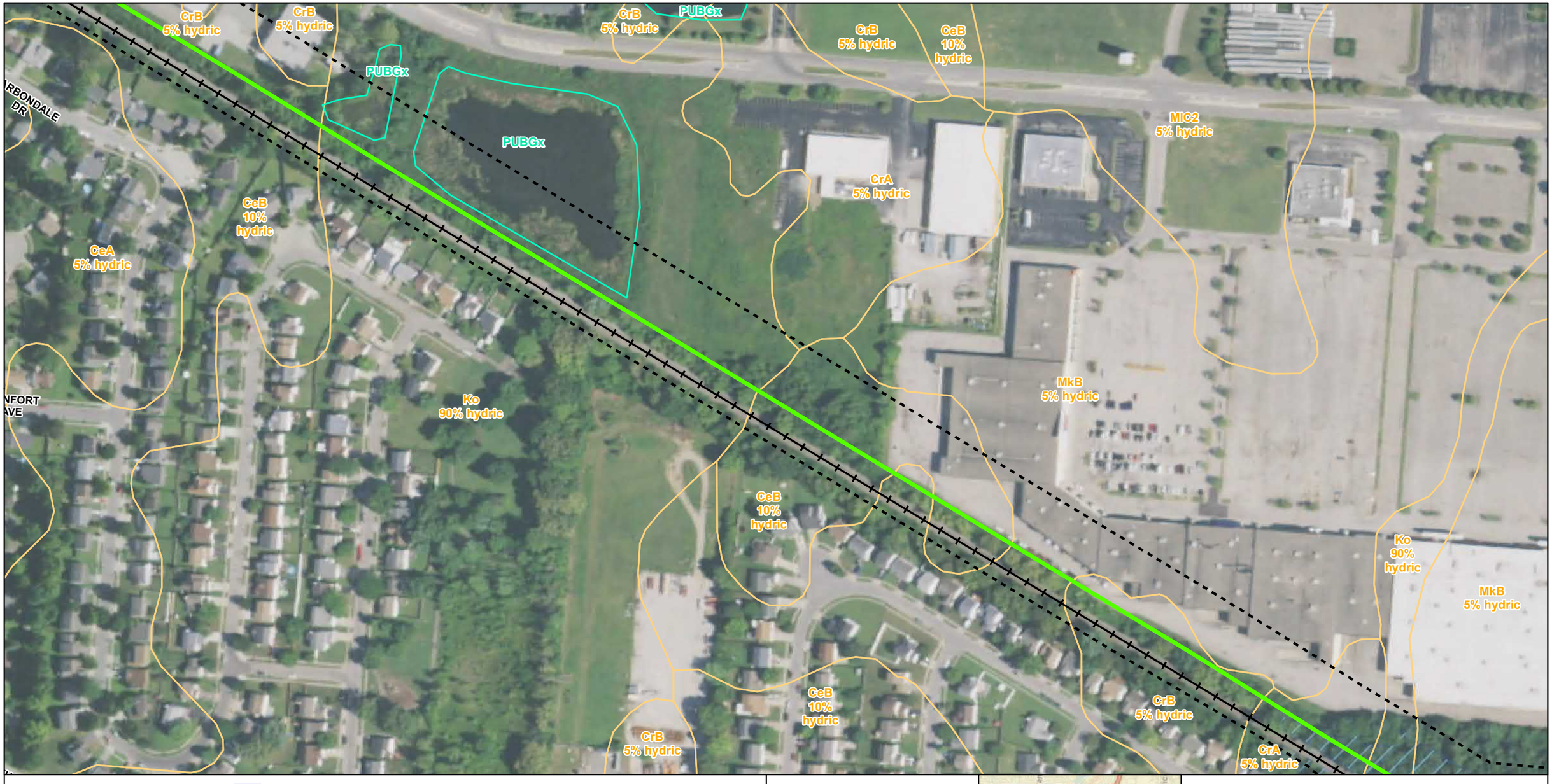


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

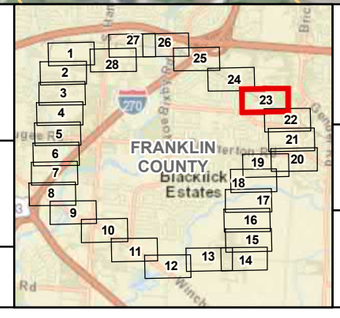


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

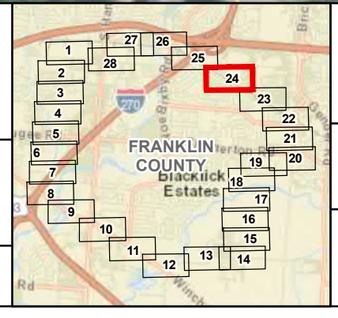


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

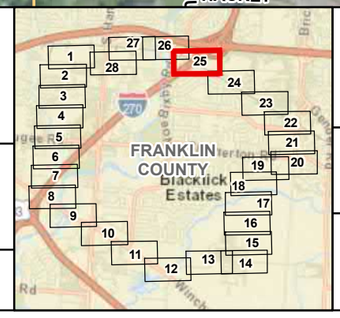


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022

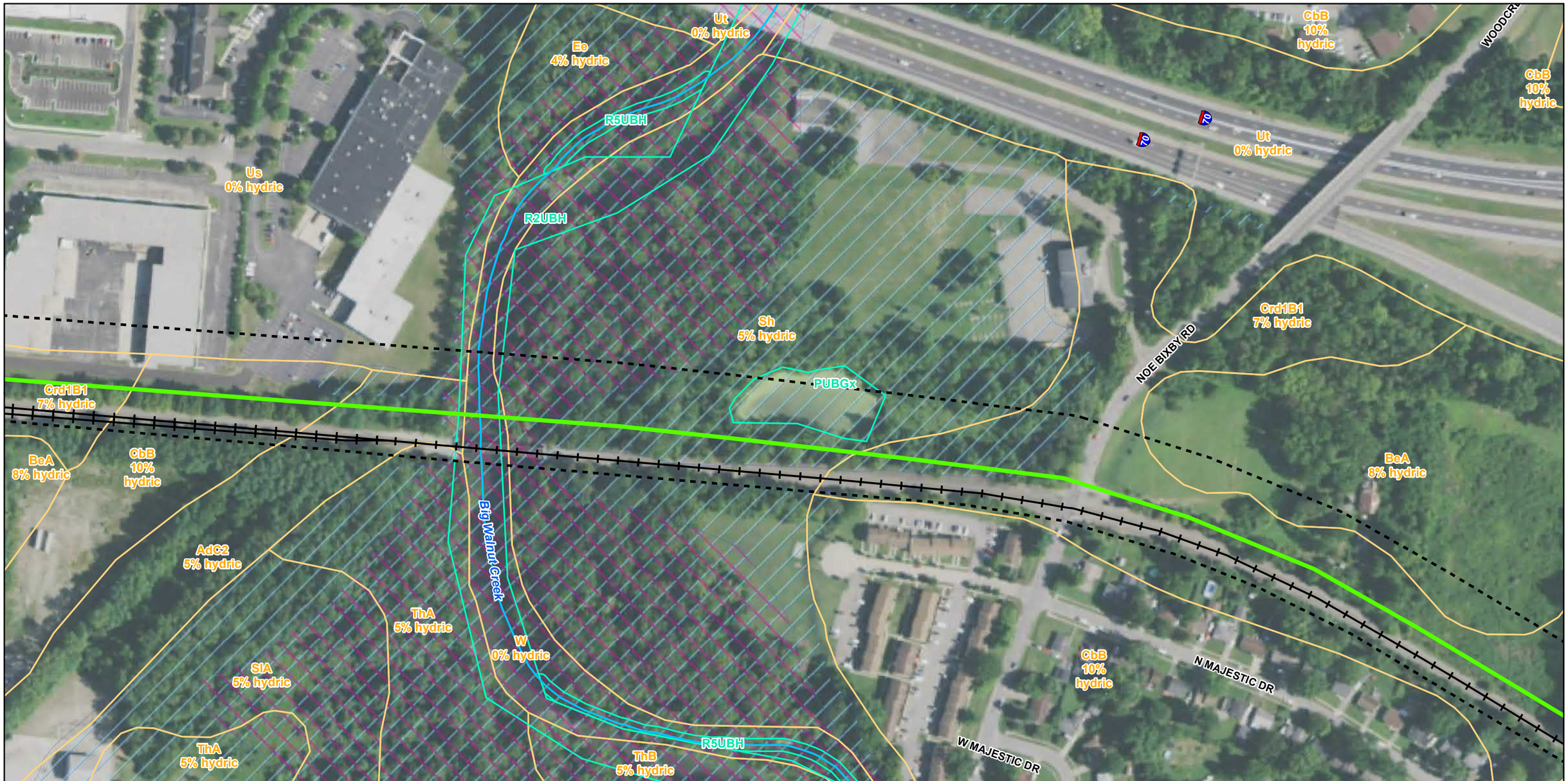


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

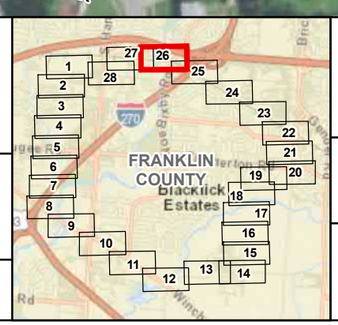


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 2. Environmental Basemap

N

0 200 400 Feet

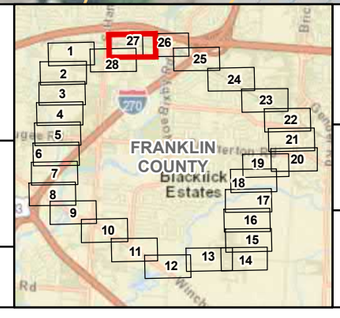


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

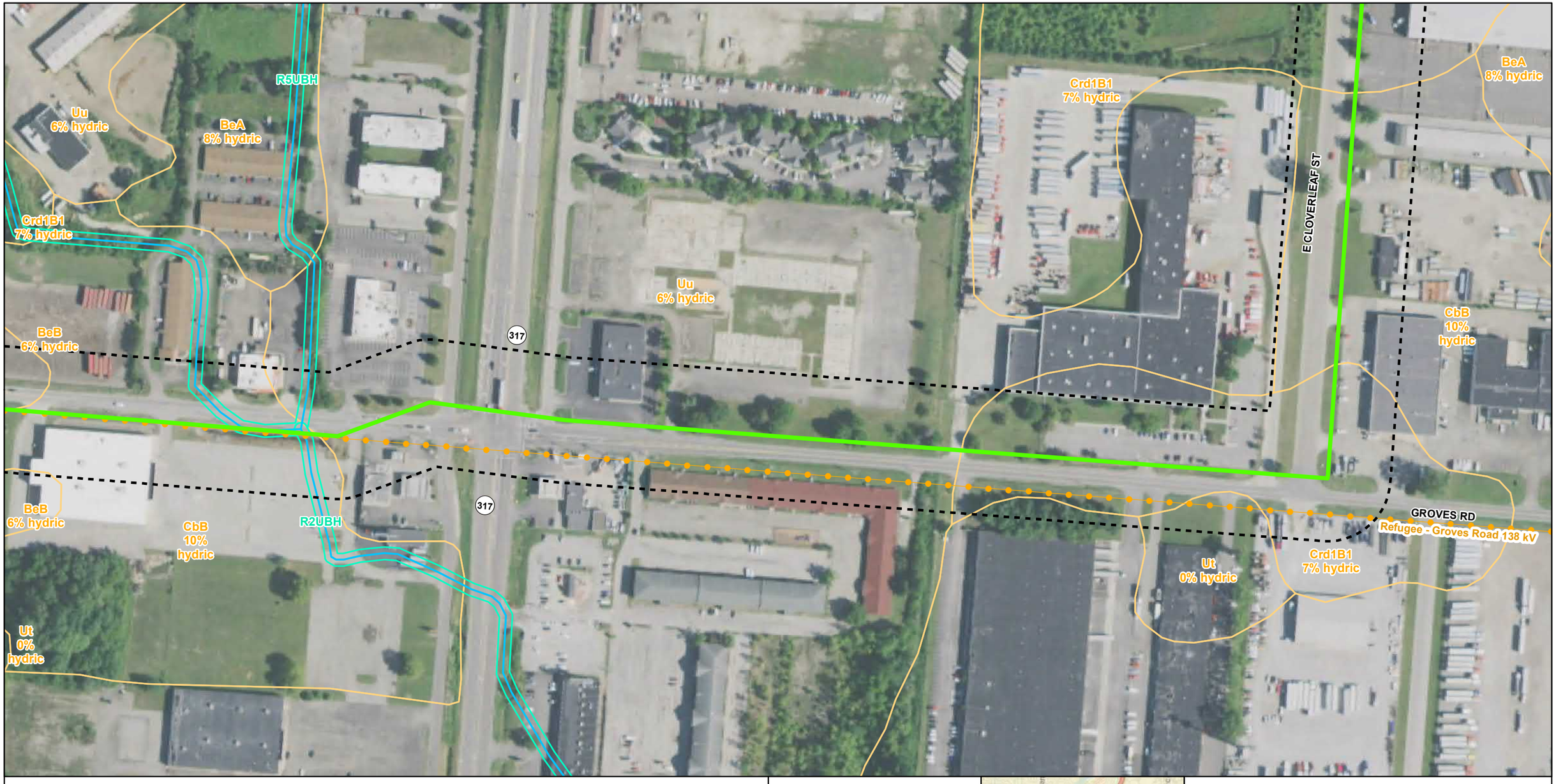
Figure 2. Environmental Basemap

AEP OHIO

wsp

N

0 200 400 Feet

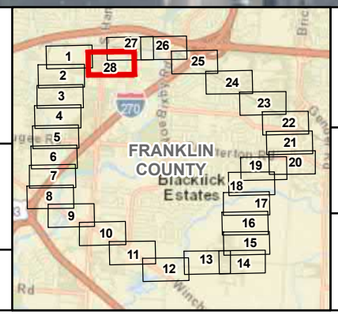


- Substation
- Alternate Route
- Preferred Route
- NHD Stream
- Environmental Survey Corridor
- NWI Wetlands
- NHD Waterbody
- Soil Map Unit
- FEMA 100-Yr Floodplain
- FEMA Floodway
- Municipal Boundary
- Township Boundary
- County Boundary

Sources:
Floodplains (FEMA 2018)
Hydrography (USGS 2019)
NAIP Imagery (USDA 2019)
NRCS Soil Units (USDA 2019)
Wetlands (USFWS 2020)

Coordinate System:
Ohio State Plane South
NAD 1983

February 15, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

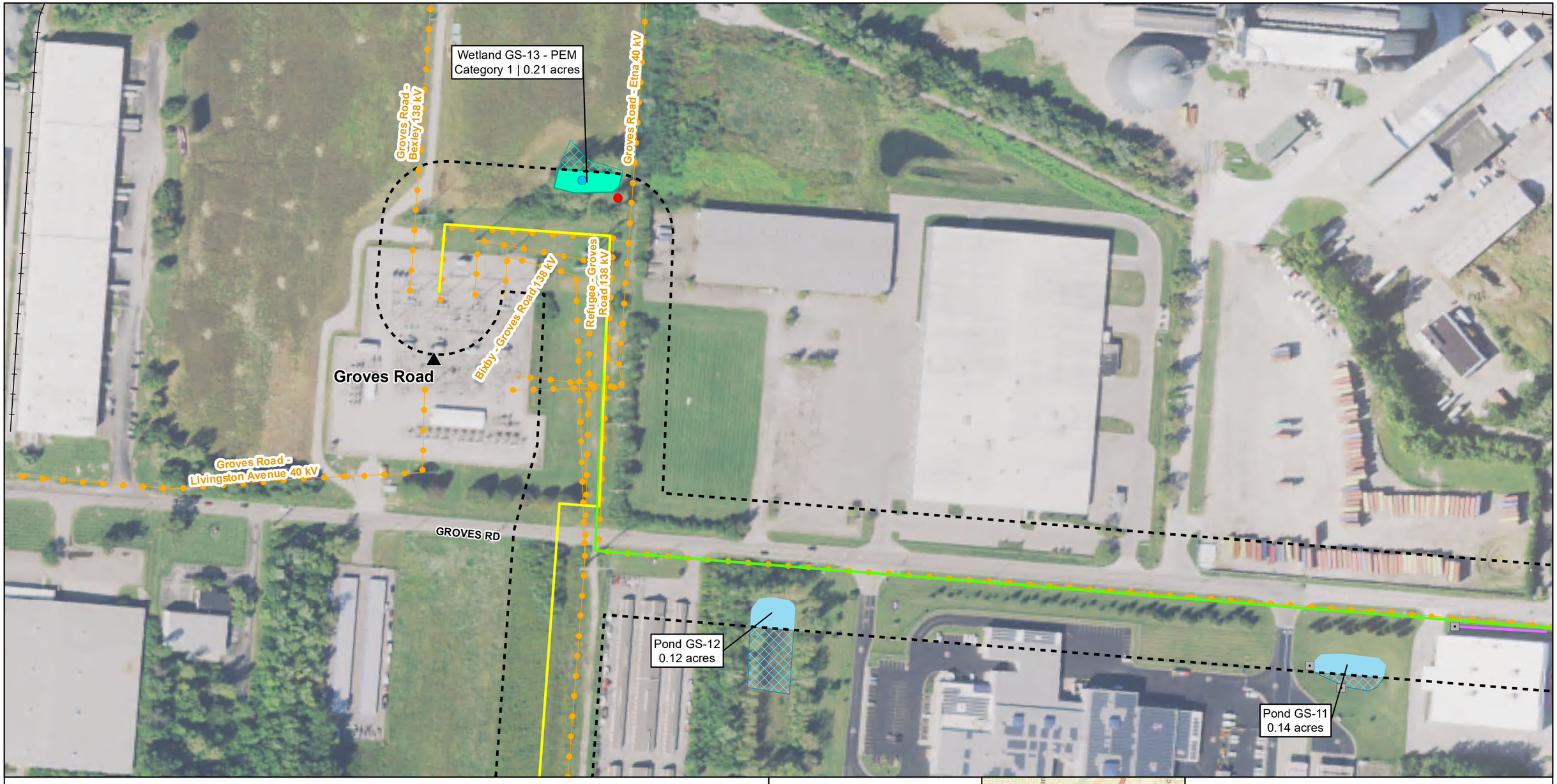
Figure 2. Environmental Basemap

AEP OHIO

WSP

N

0 200 400 Feet

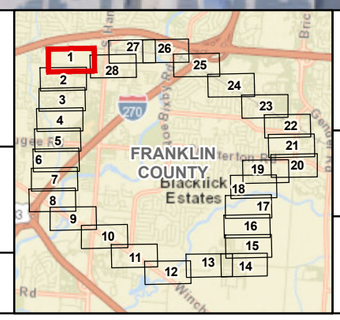


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

AEP OHIO

WSP

N

0 200 400 Feet

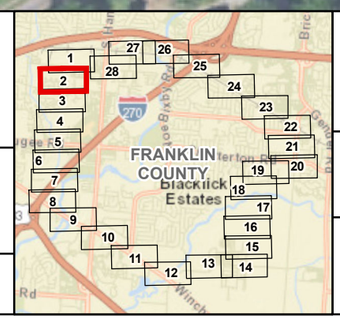


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

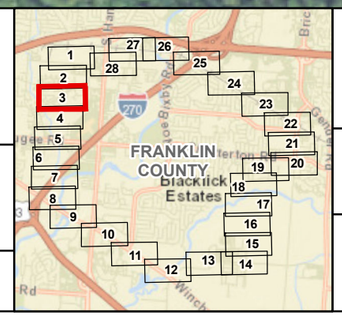
WYNDS CT
TEMPEST DR
IDES CT
WYNDS DR
ZEPHYR PL
PETZINGER RD
Bixby - Groves Road 138 kV
N KIMBERLY PKWY
E KIMBERLY PKWY
Wetland GS-01 - PFO
Category 1 | 0.22 acres
Wetland GS-01 - PEM
Category 1 | 0.25 acres

- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

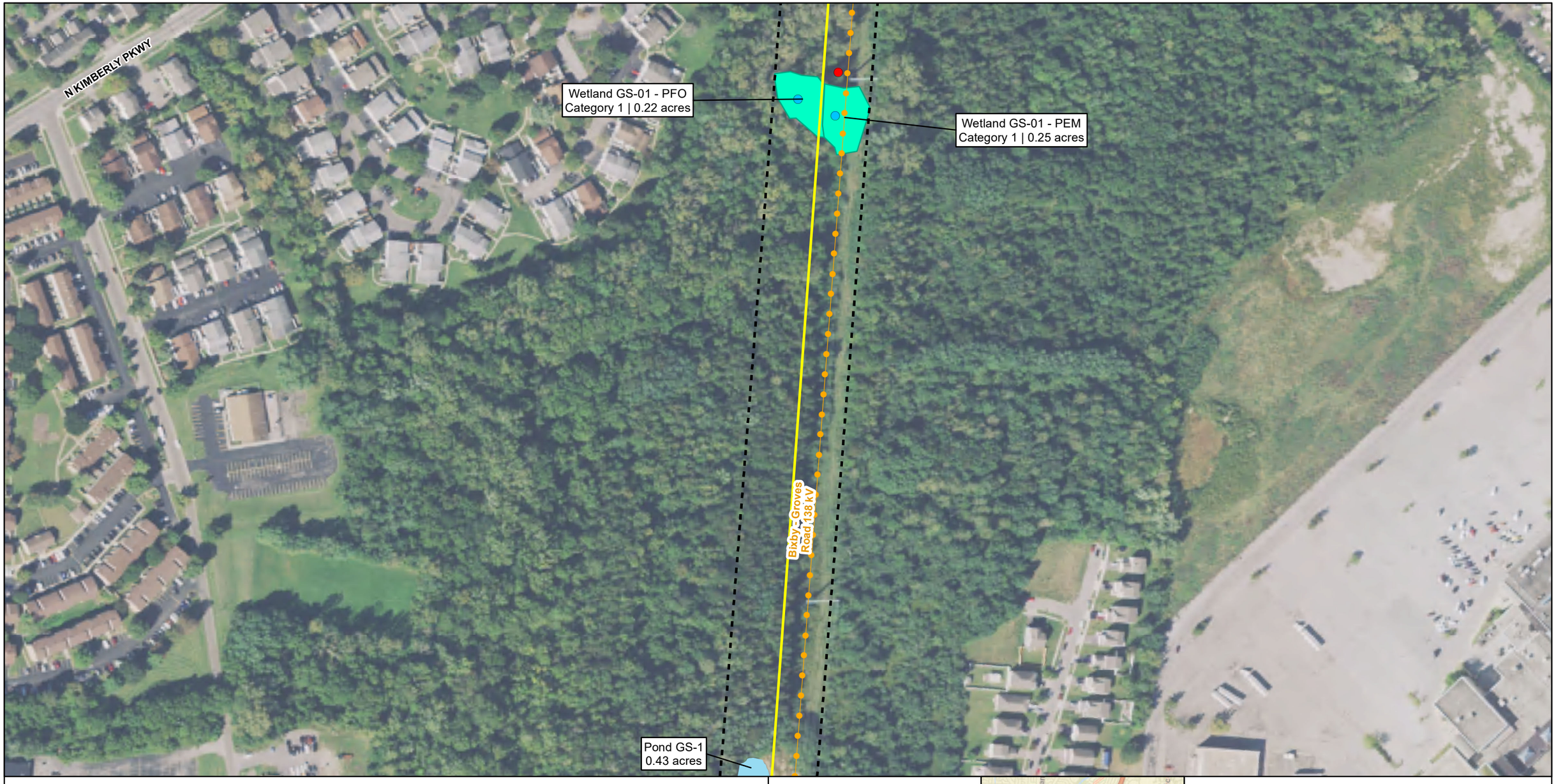
Figure 3. Delineated Features

AEP OHIO

WSP

N

0 200 400 Feet

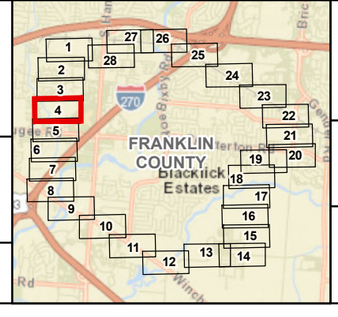


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

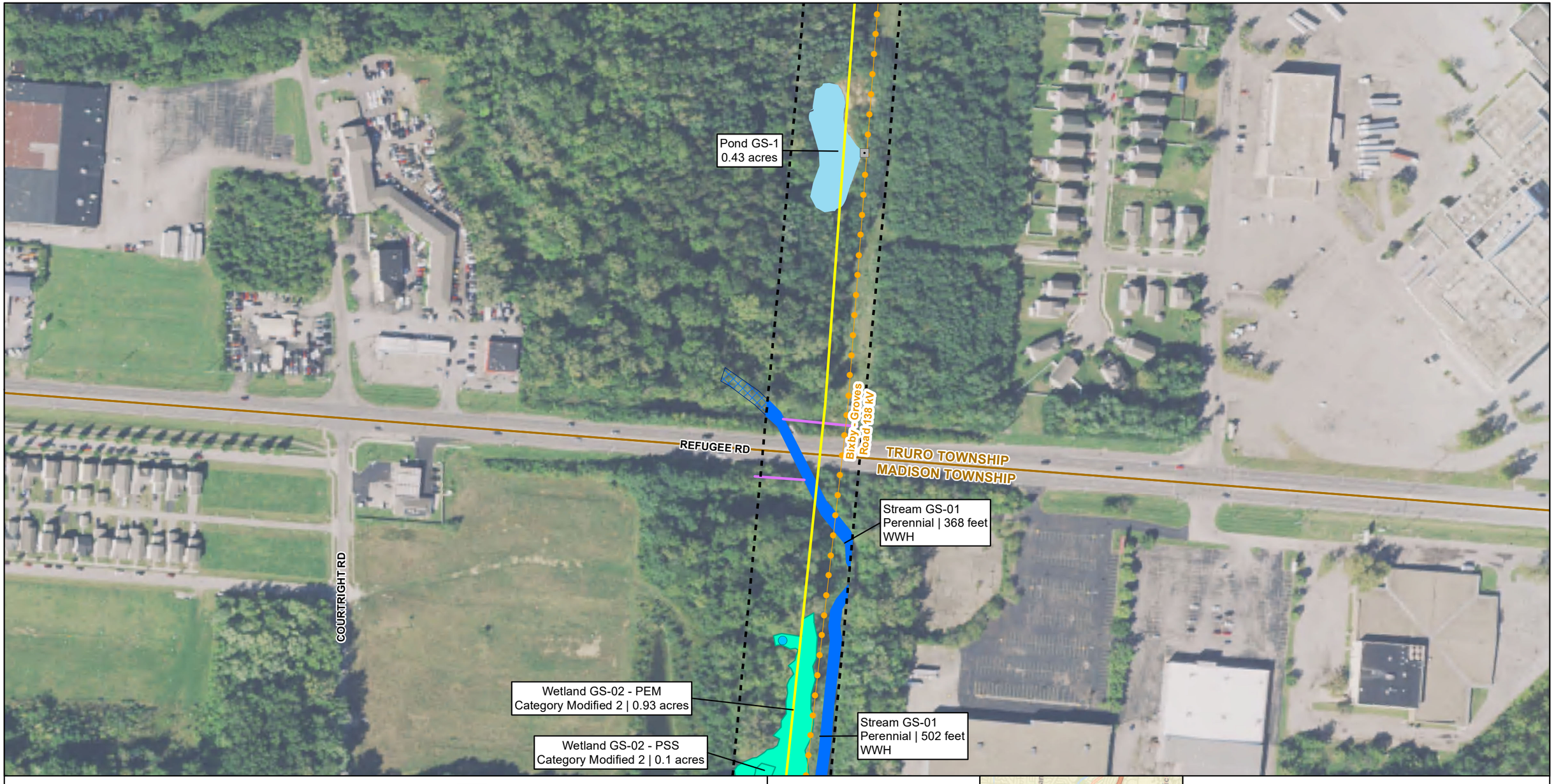
Figure 3. Delineated Features

AEP OHIO

WSP

N

0 200 400 Feet

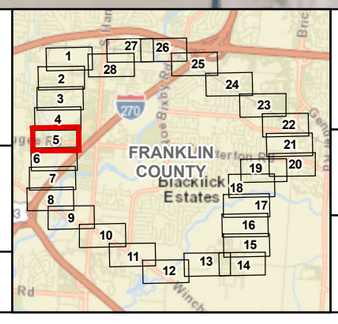


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

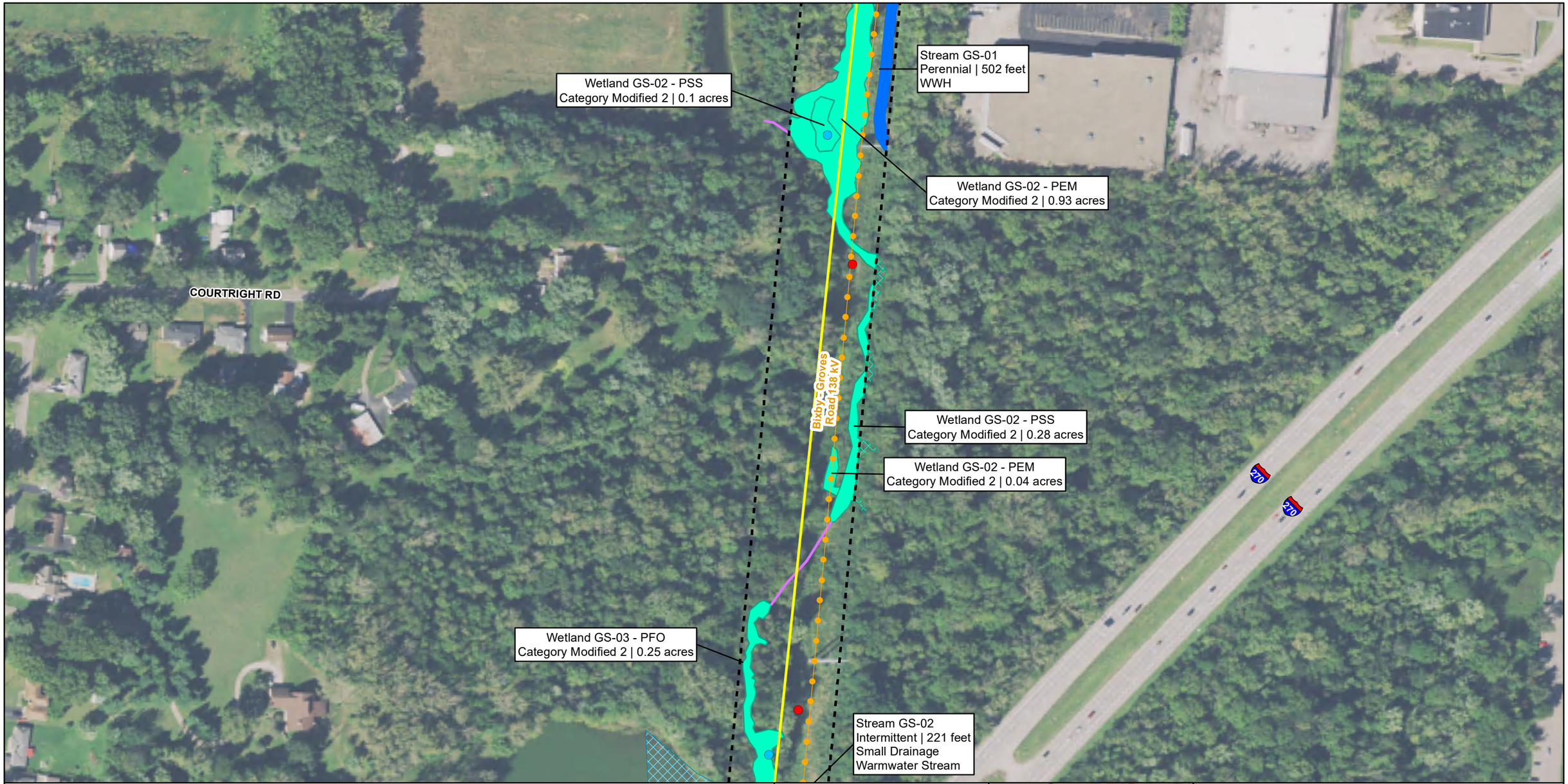


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

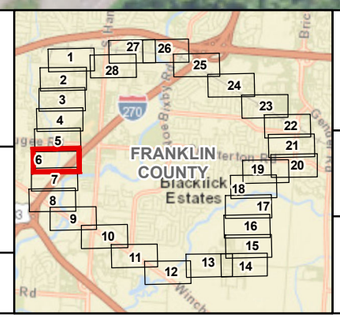


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

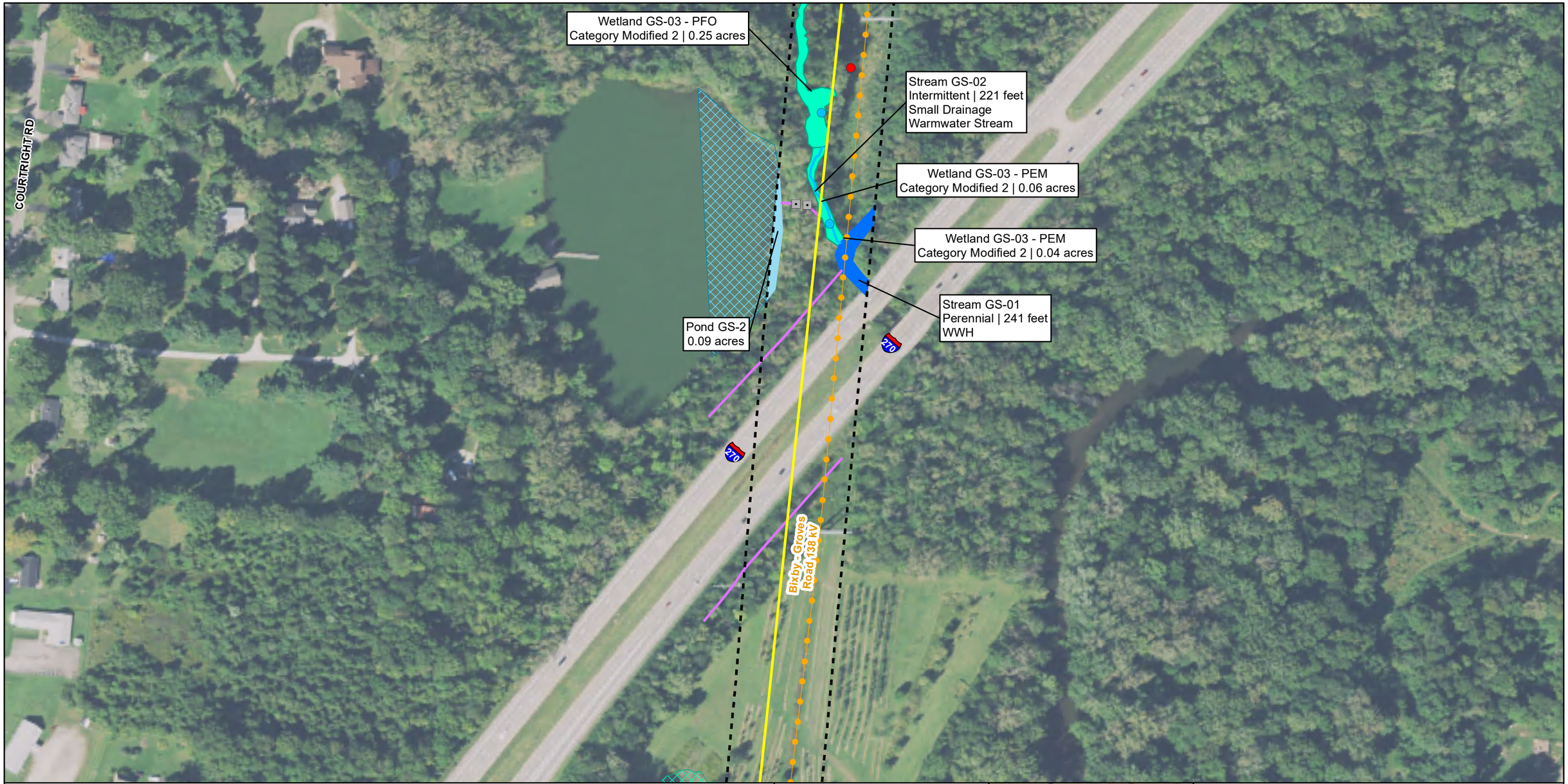
Figure 3. Delineated Features

AEP OHIO

WSP

N

0 200 400 Feet

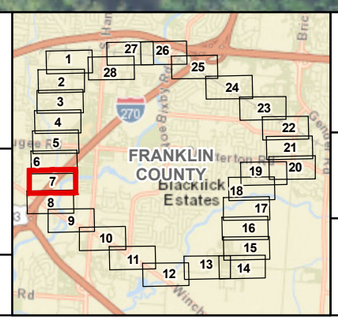


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

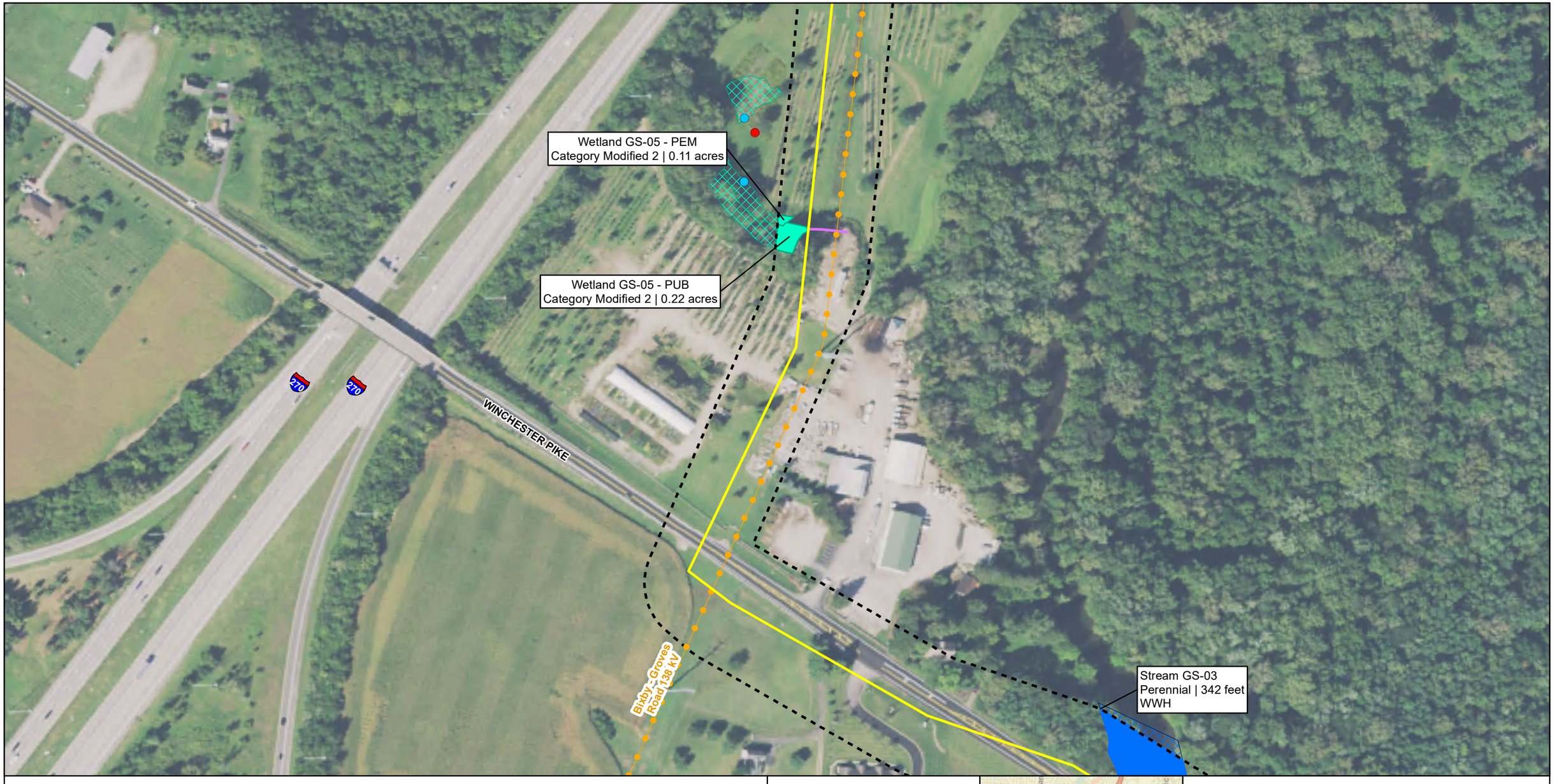


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

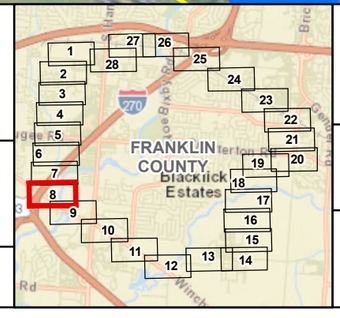


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

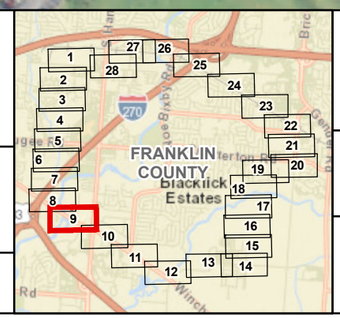


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

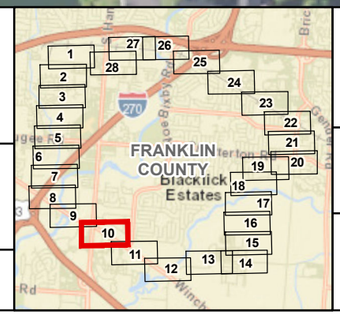


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

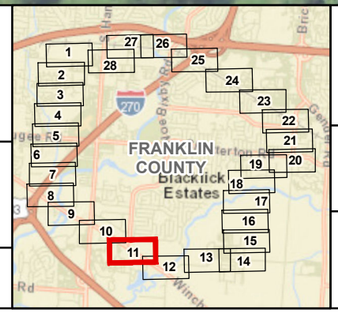


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

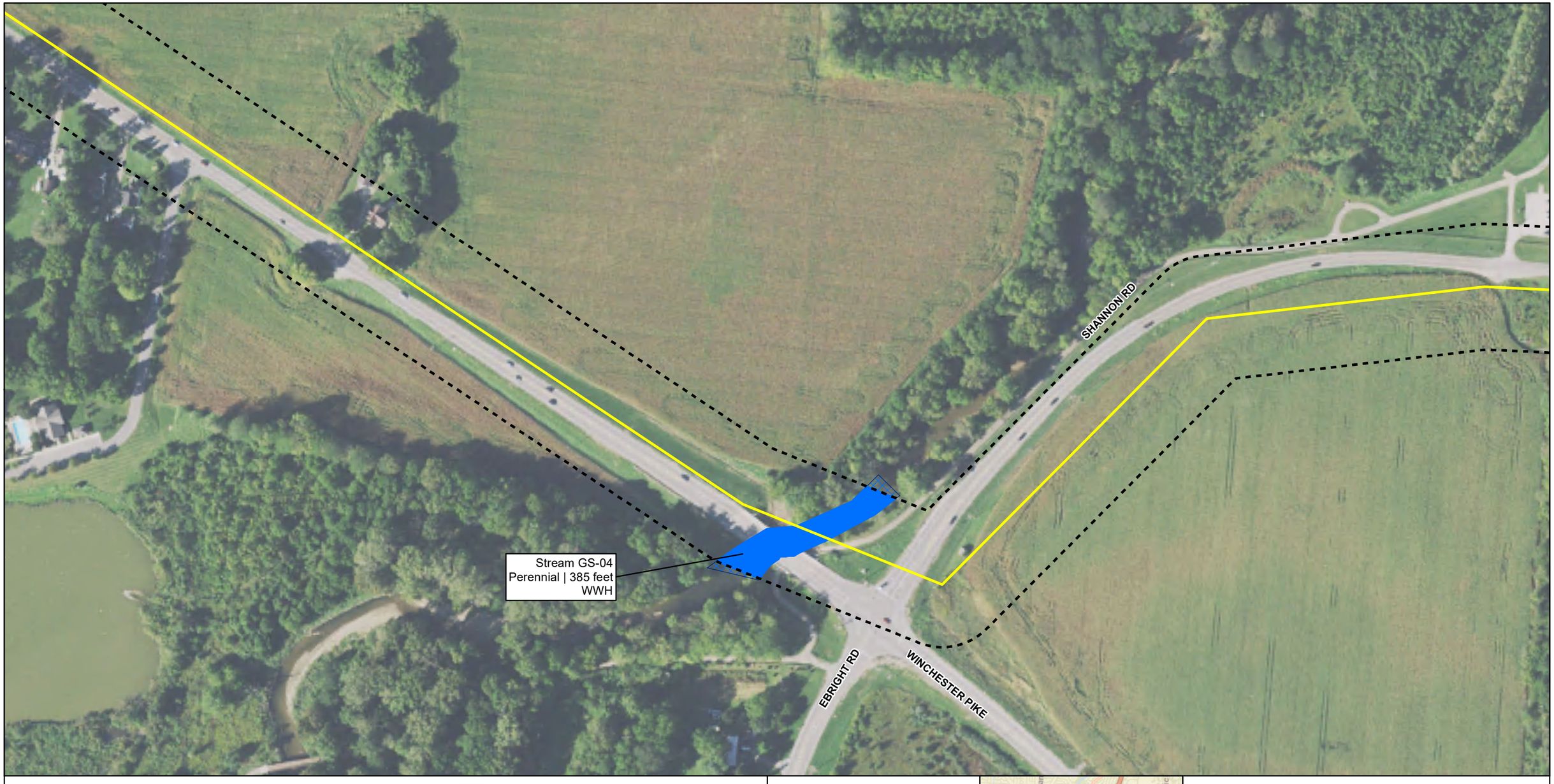


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet



Substation
Upland Data Point
Wetland Data Point
Culvert
Alternate Route
Preferred Route
Existing Transmission Line
Railroad

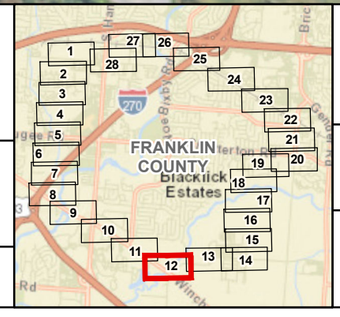
Non-Jurisdictional Drainage Ditch
Delineated Stream
Approximate Stream
Environmental Survey Corridor
Delineated Stream Area
Approximate Stream Area
Delineated Pond

Approximate Pond
Delineated Wetland
Approximate Wetland
County Boundary
Township Boundary
Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

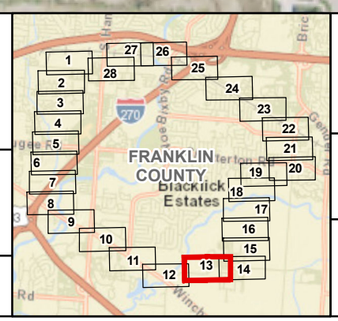


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

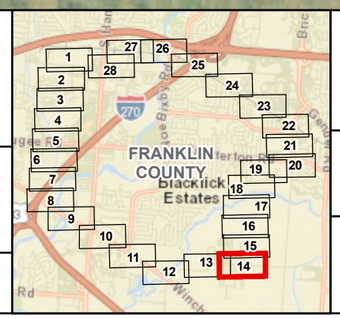


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

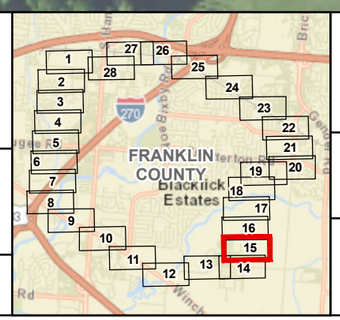


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

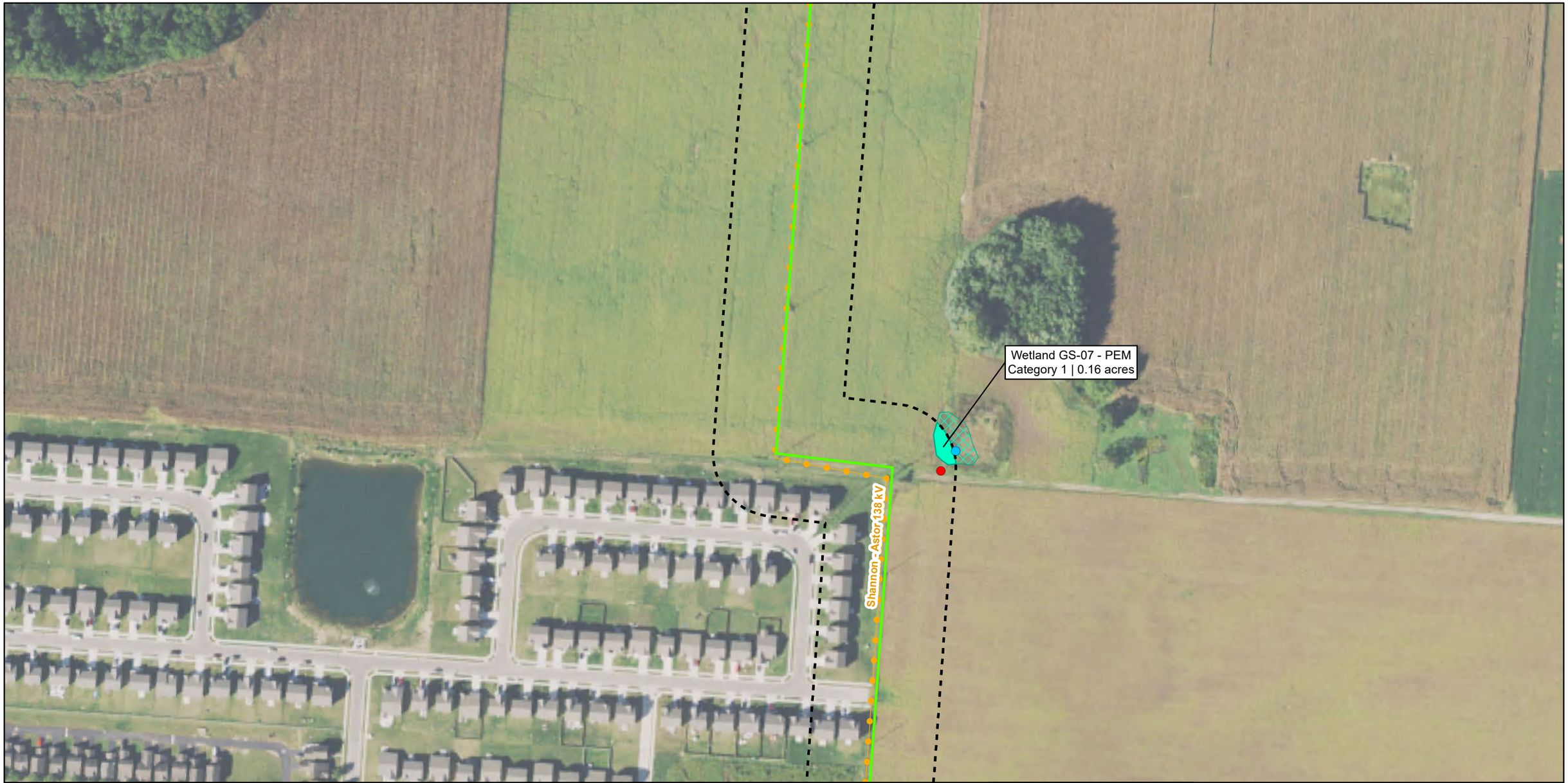
Figure 3. Delineated Features

AEP OHIO

wsp

N

0 200 400 Feet

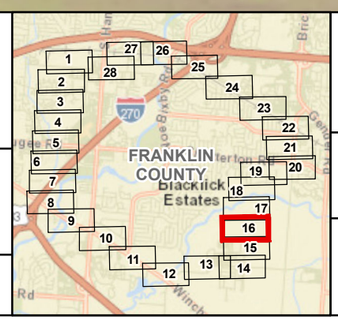


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

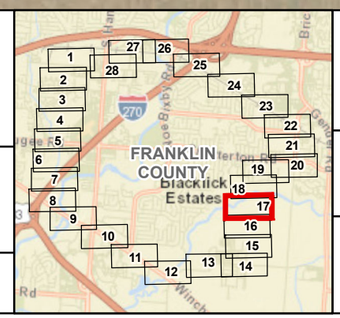


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

Pond AS-2
0.23 acres

Pond AS-1
0.26 acres

Shannon - Astor 138 kV

Wetland AS-02 - PEM
Category 1 | 0.21 acres

Stream AS-07
Perennial | 222 feet
WWH

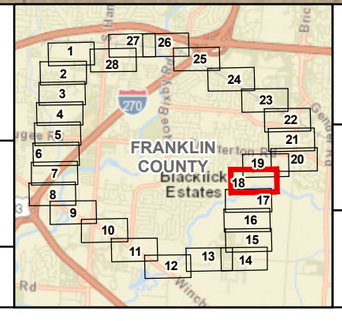
Stream AS-07
Perennial | 305 feet
WWH

- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

AEP OHIO

wsp

N

0 200 400 Feet

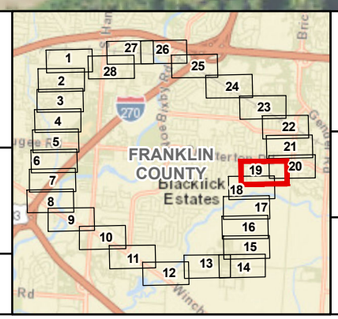


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

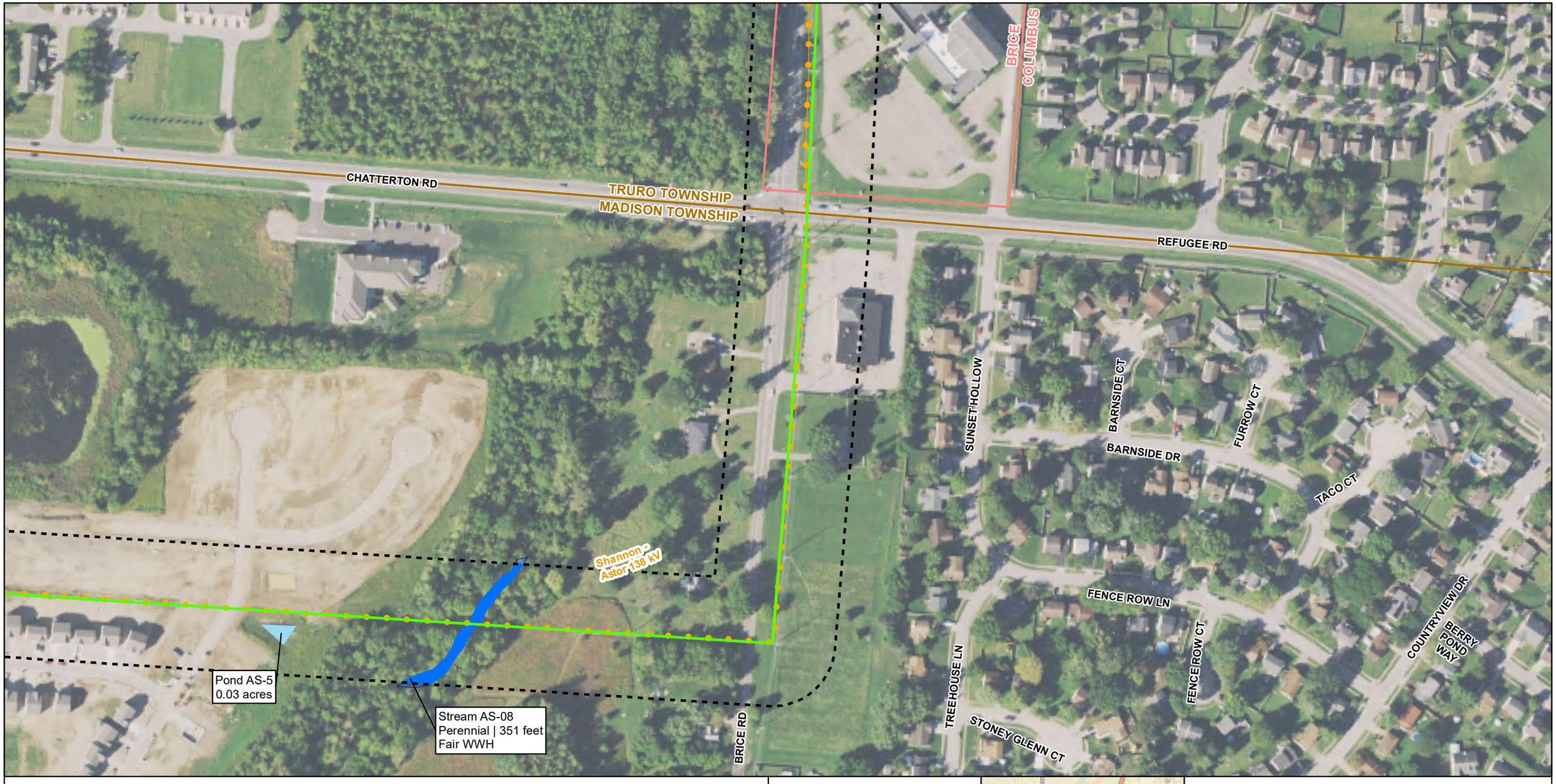


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

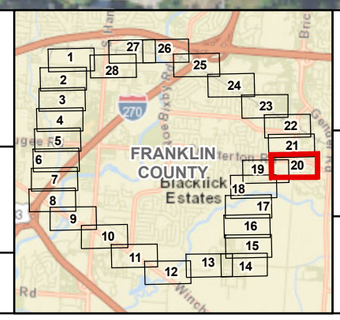


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

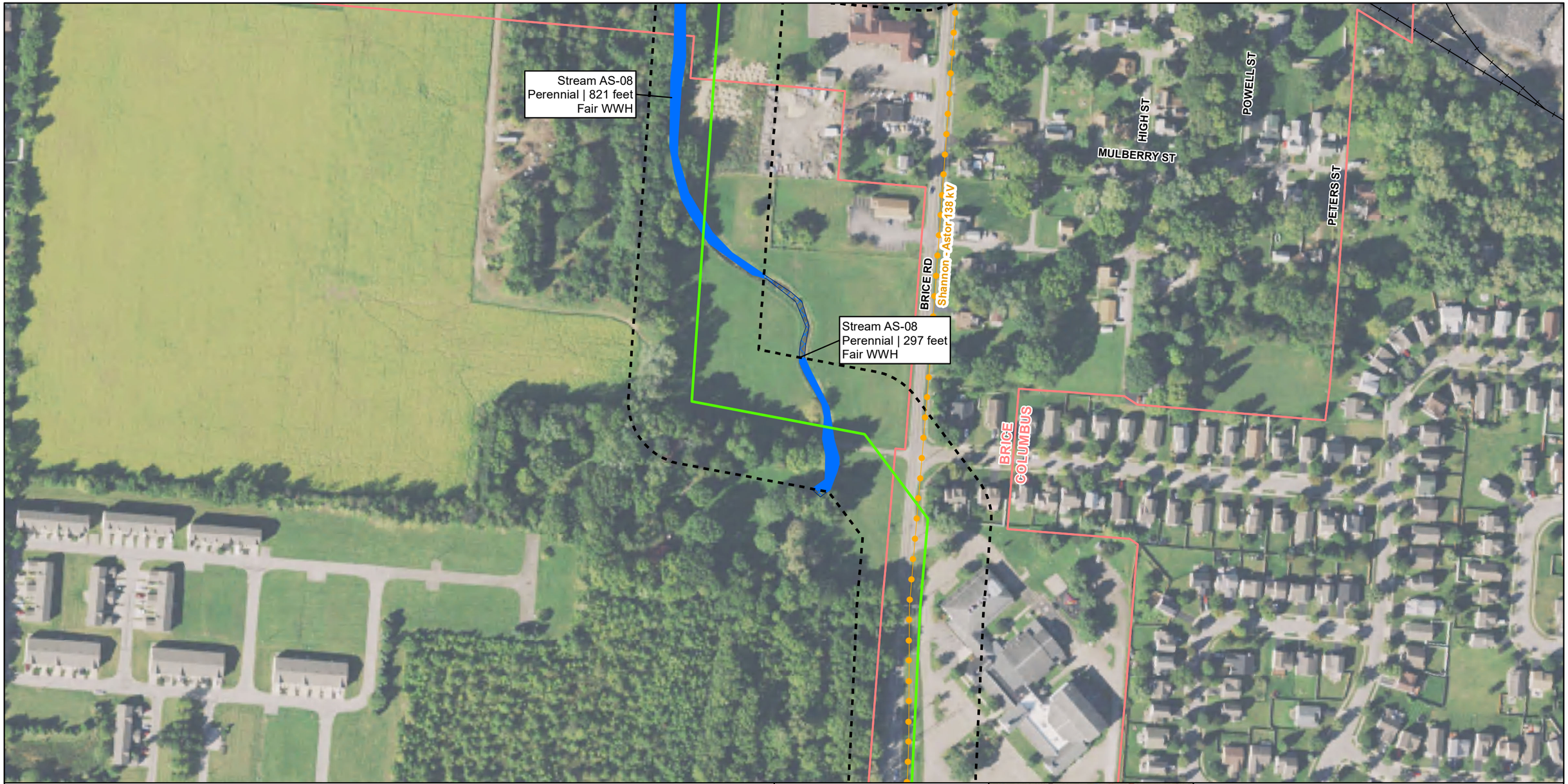


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

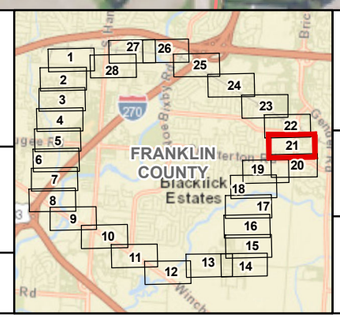


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

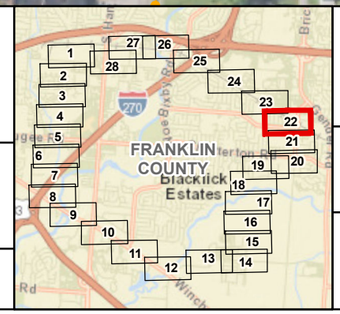


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

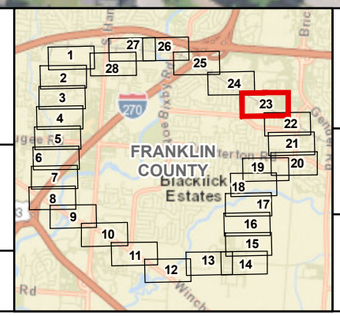


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

AEP OHIO

WSP

N

0 200 400 Feet

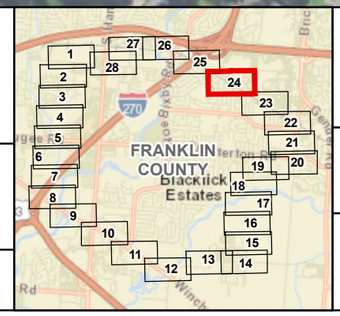


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

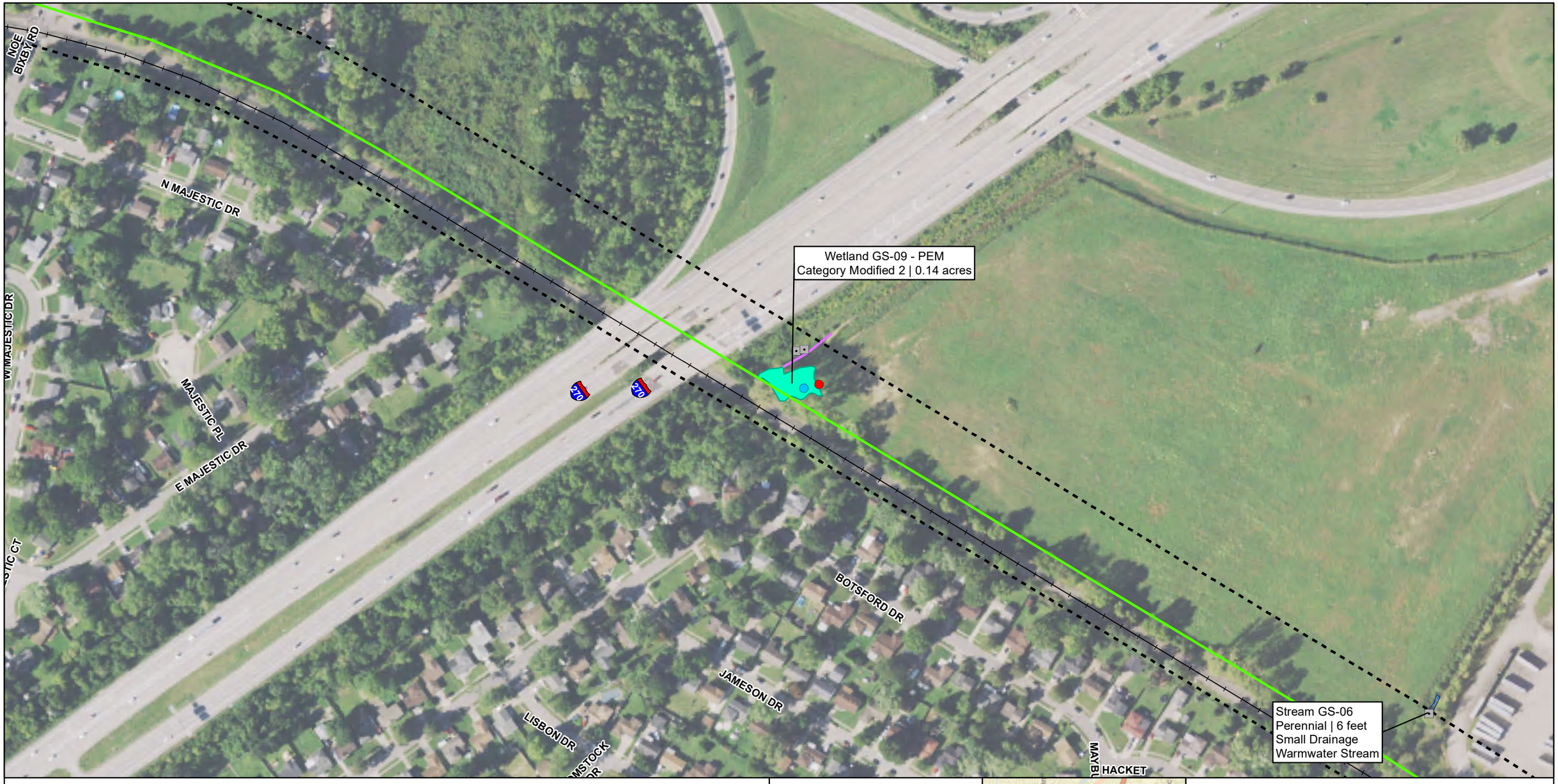
Figure 3. Delineated Features

AEP OHIO

wsp

N

0 200 400 Feet

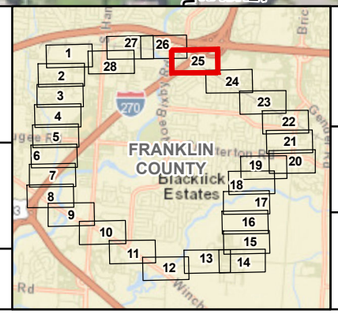


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

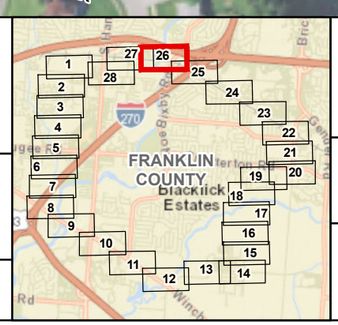


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

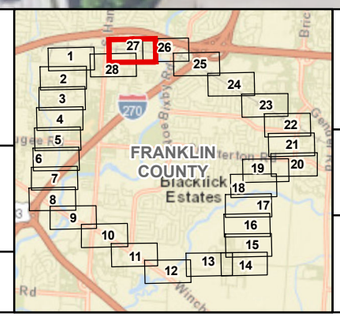


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

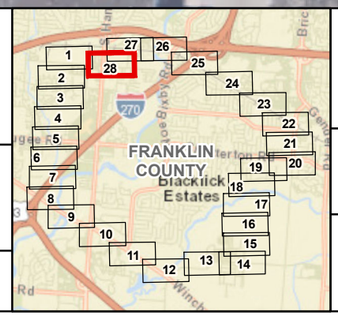


- Substation
- Upland Data Point
- Wetland Data Point
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Non-Jurisdictional Drainage Ditch
- Delineated Stream
- Approximate Stream
- Environmental Survey Corridor
- Delineated Stream Area
- Approximate Stream Area
- Delineated Pond
- Approximate Pond
- Delineated Wetland
- Approximate Wetland
- County Boundary
- Township Boundary
- Municipal Boundary

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

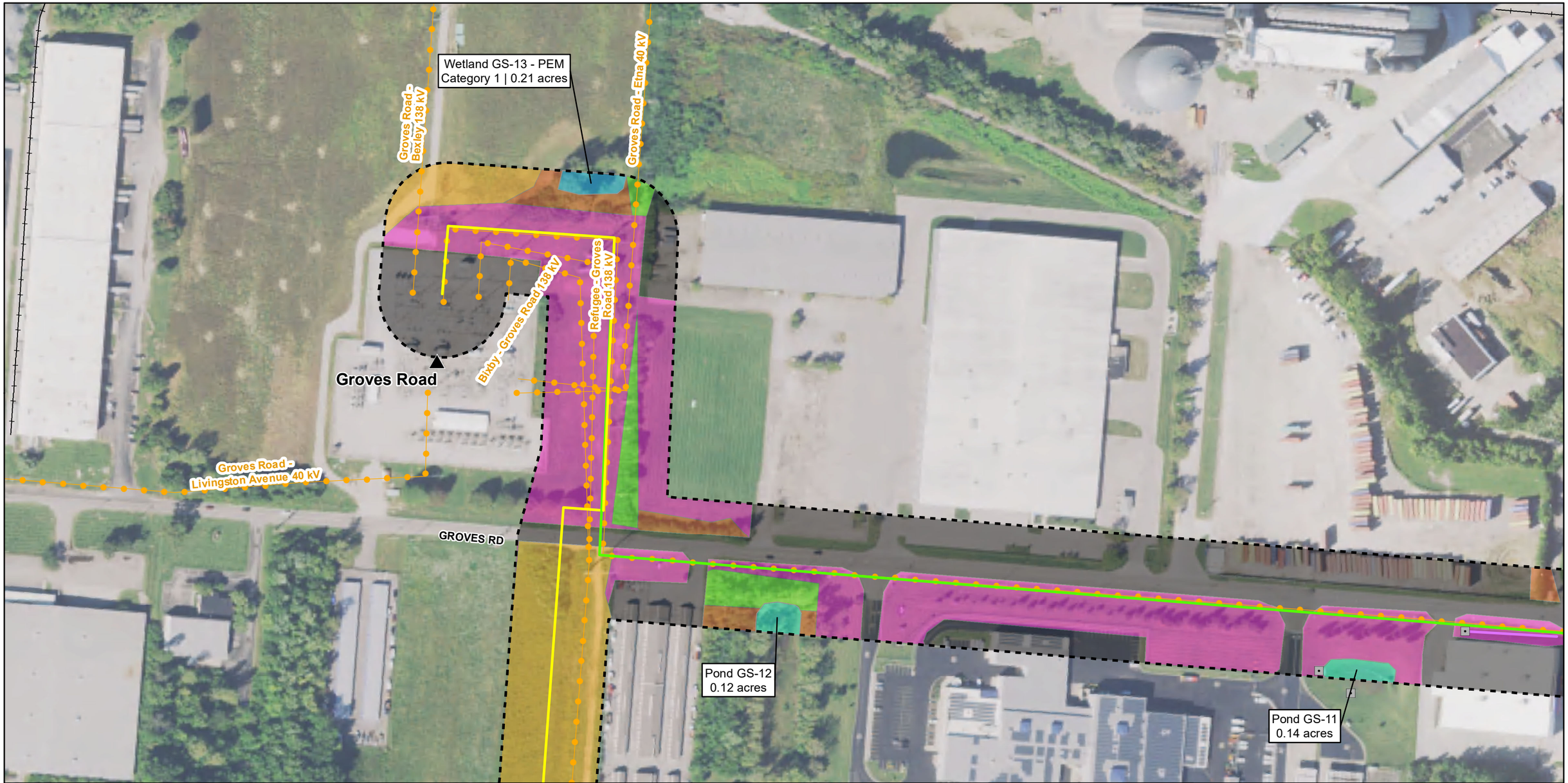


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 3. Delineated Features

N

0 200 400 Feet

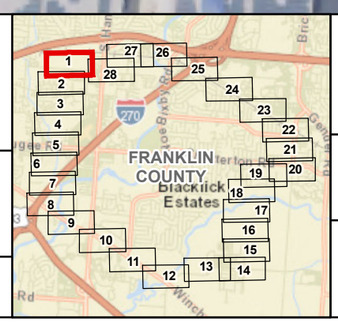


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

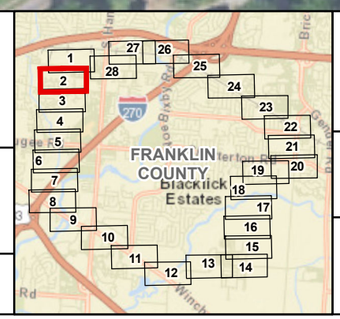


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

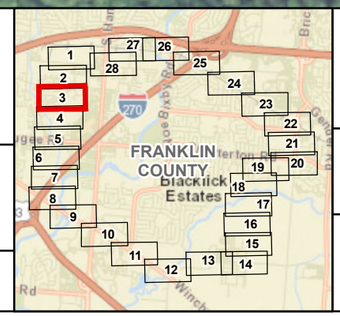


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

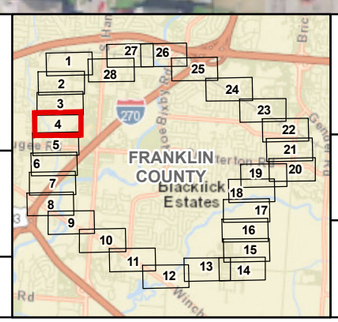


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

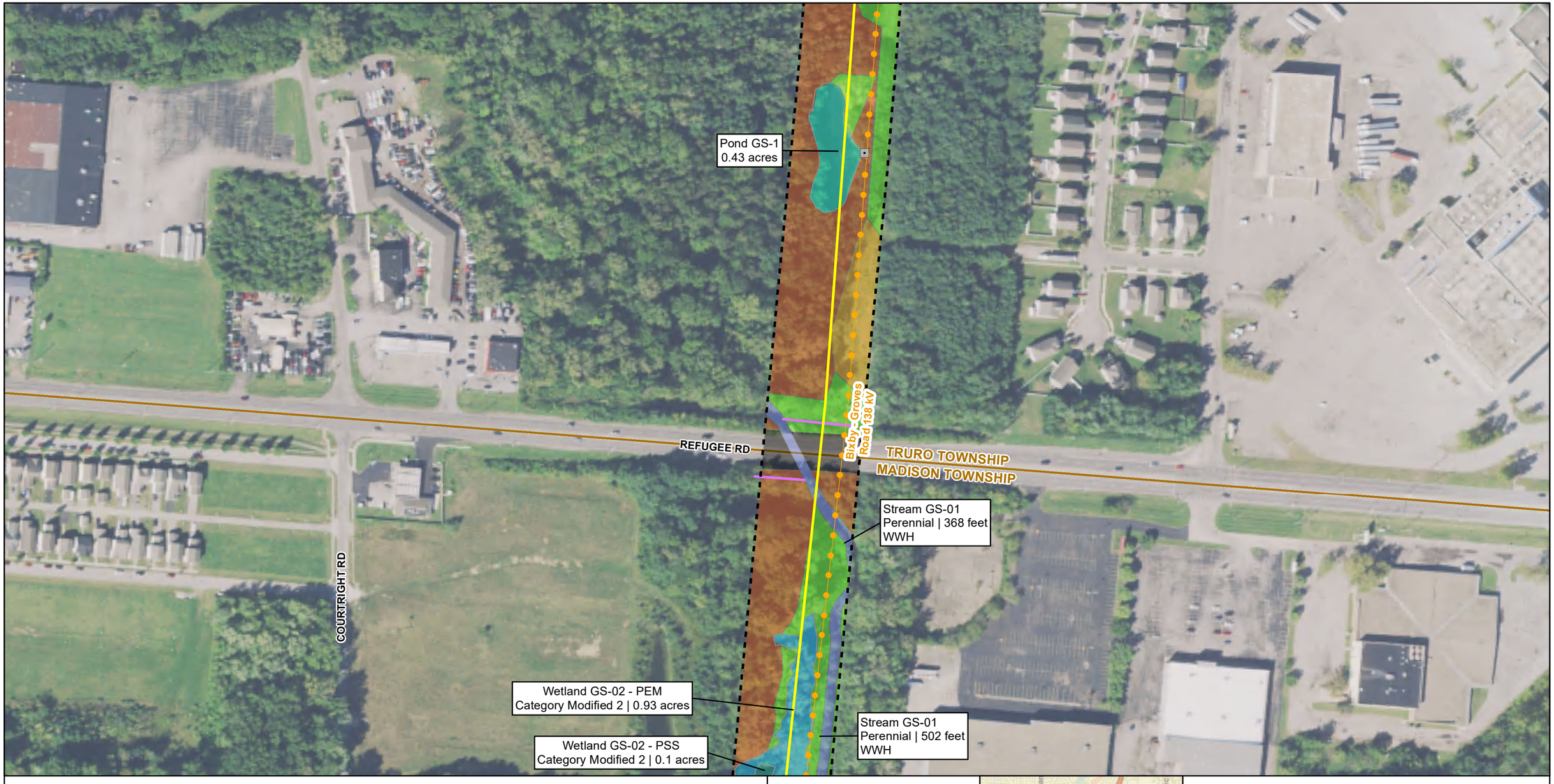


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

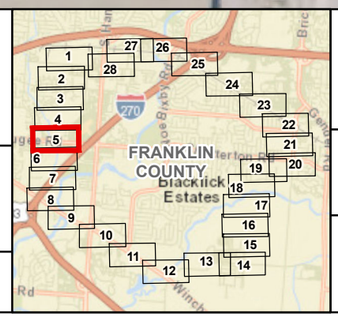


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

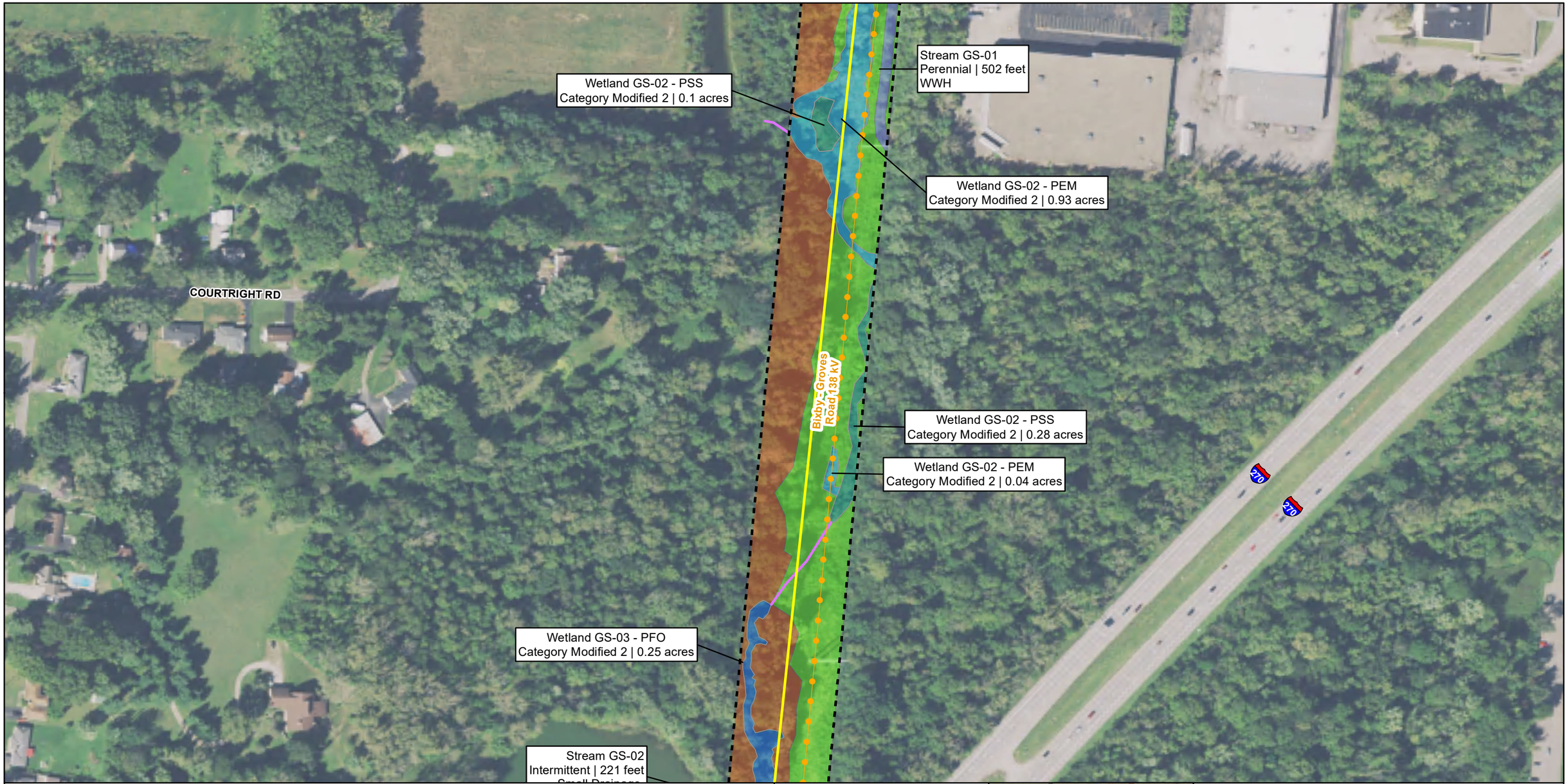


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

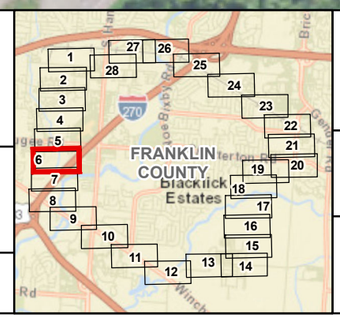


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

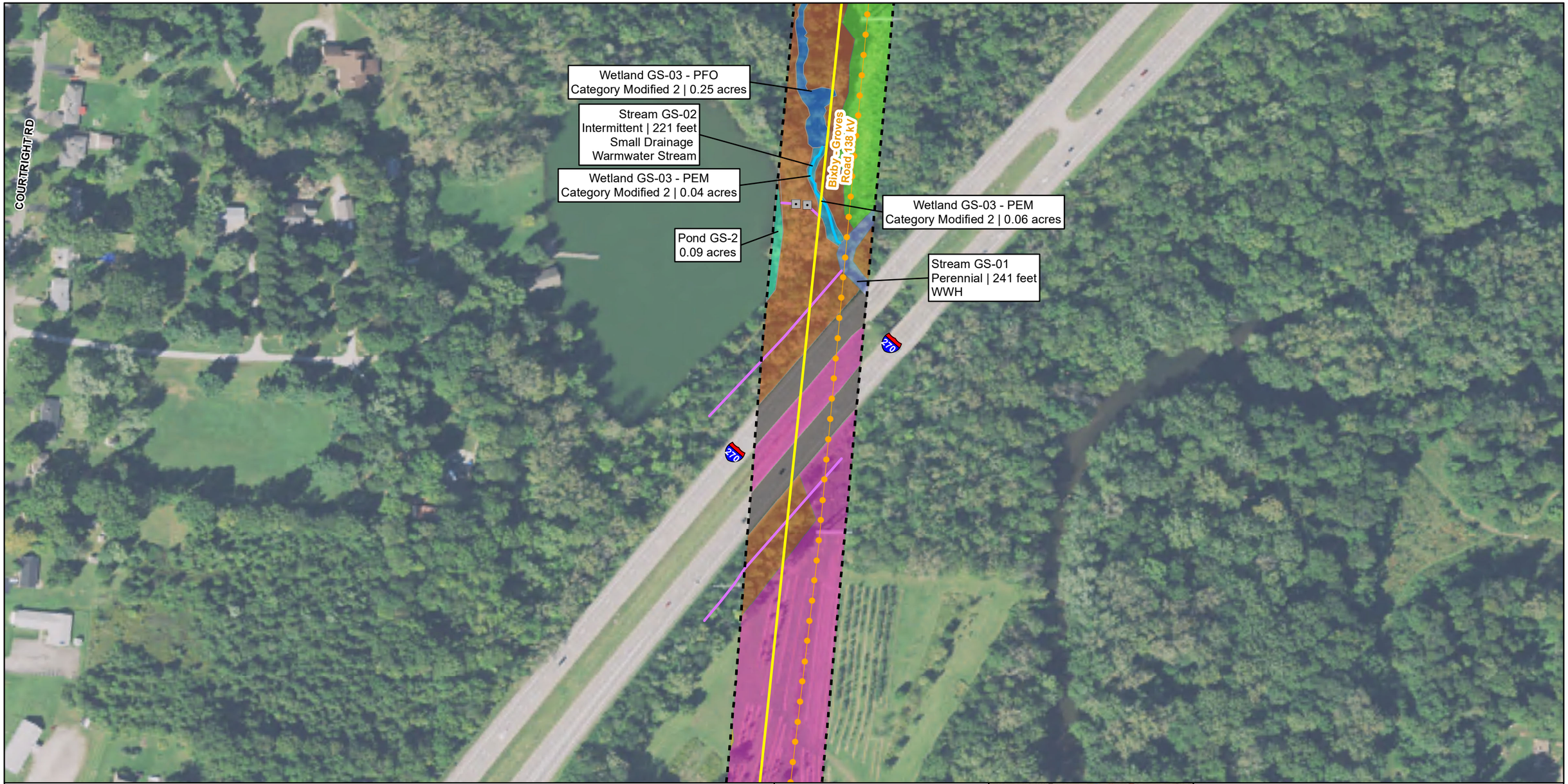
Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

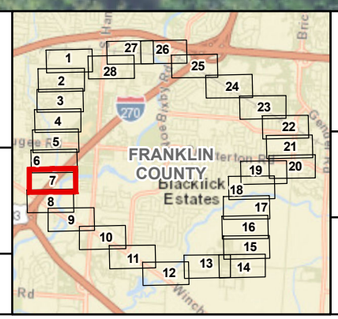


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

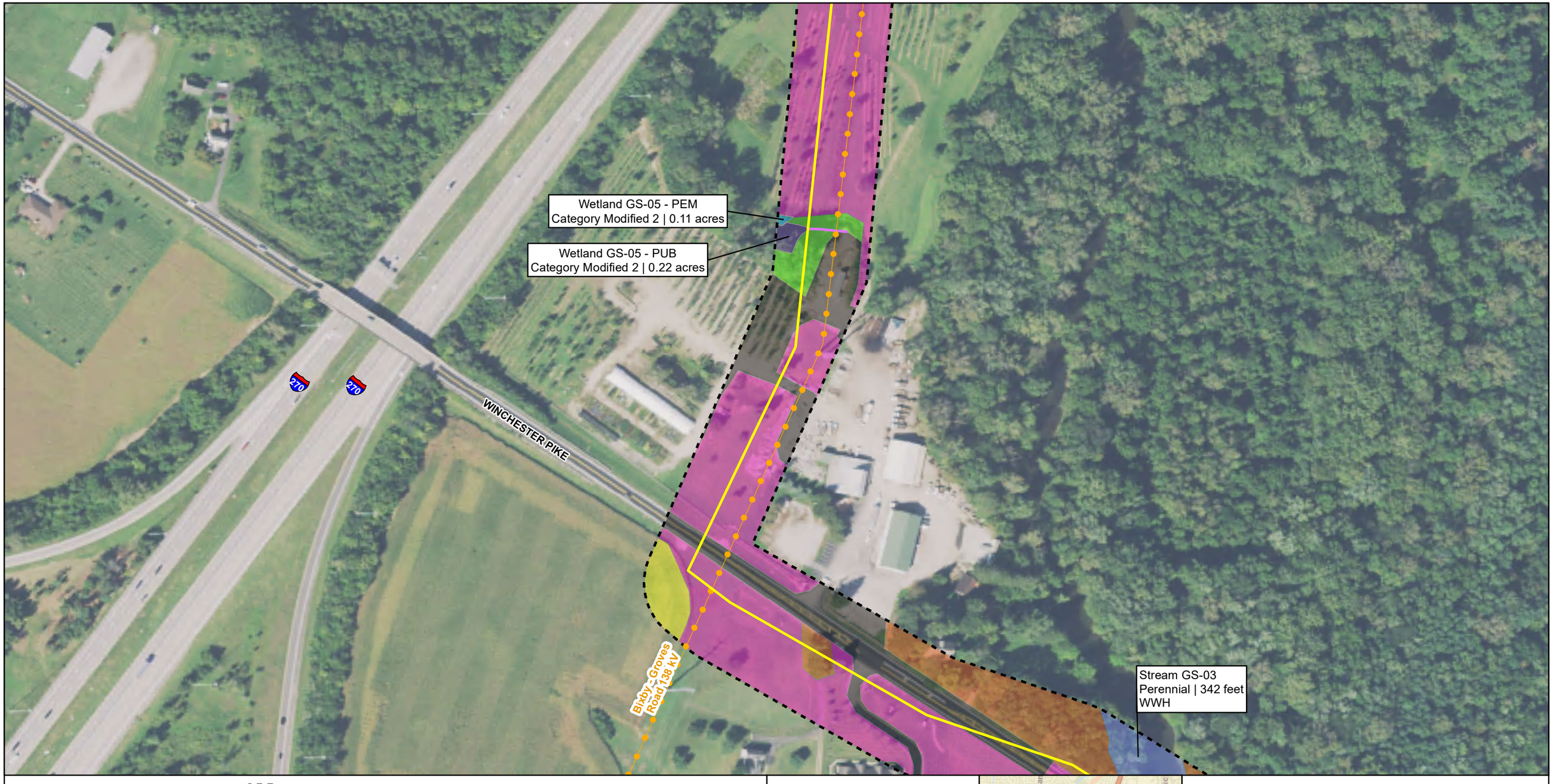
Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

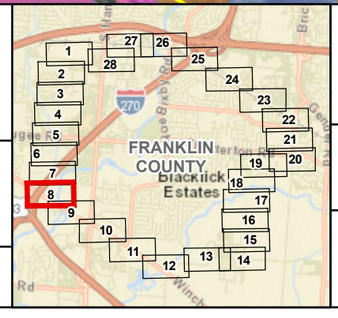


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

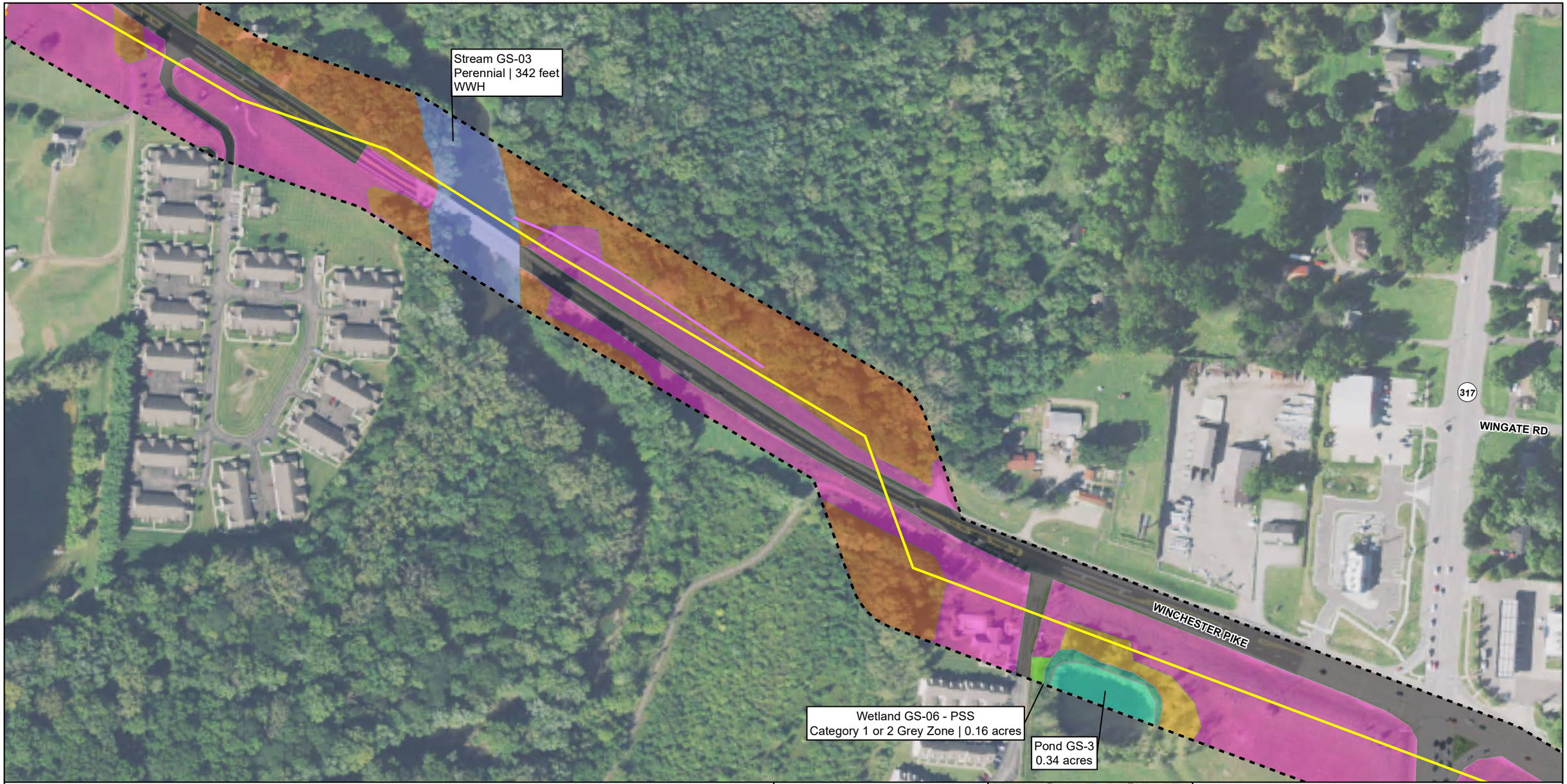
Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

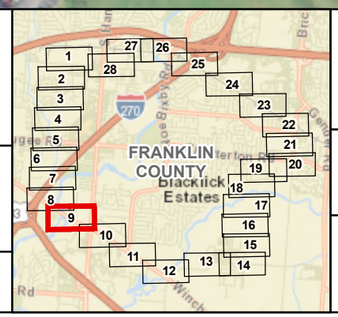


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

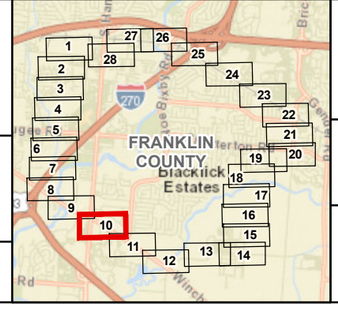


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

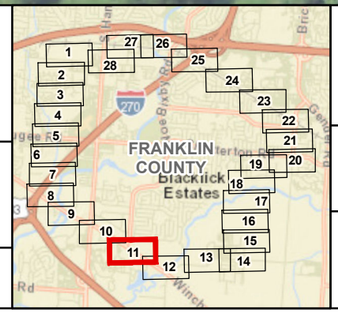


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

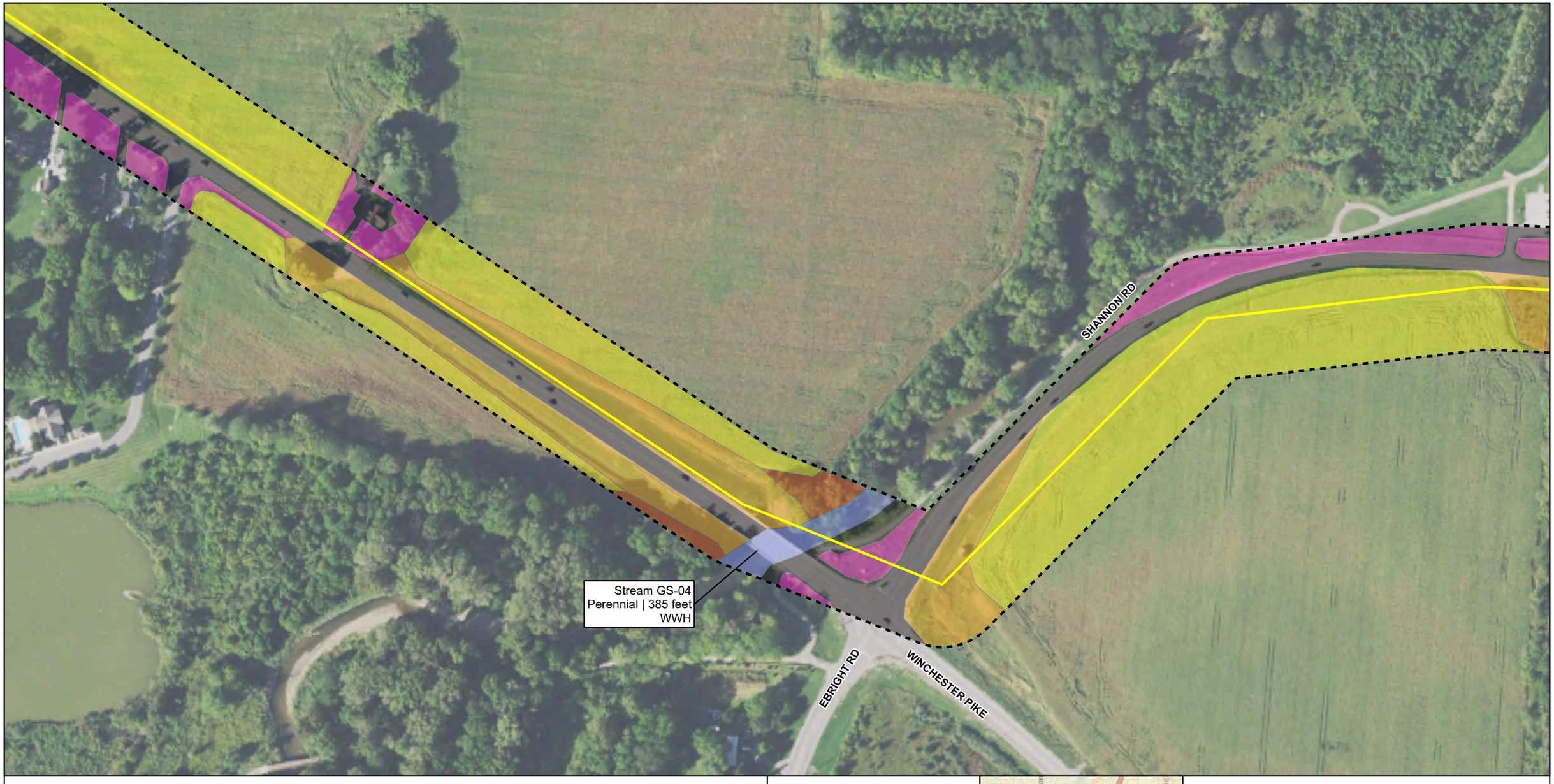


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

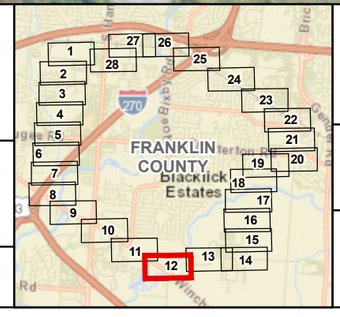


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

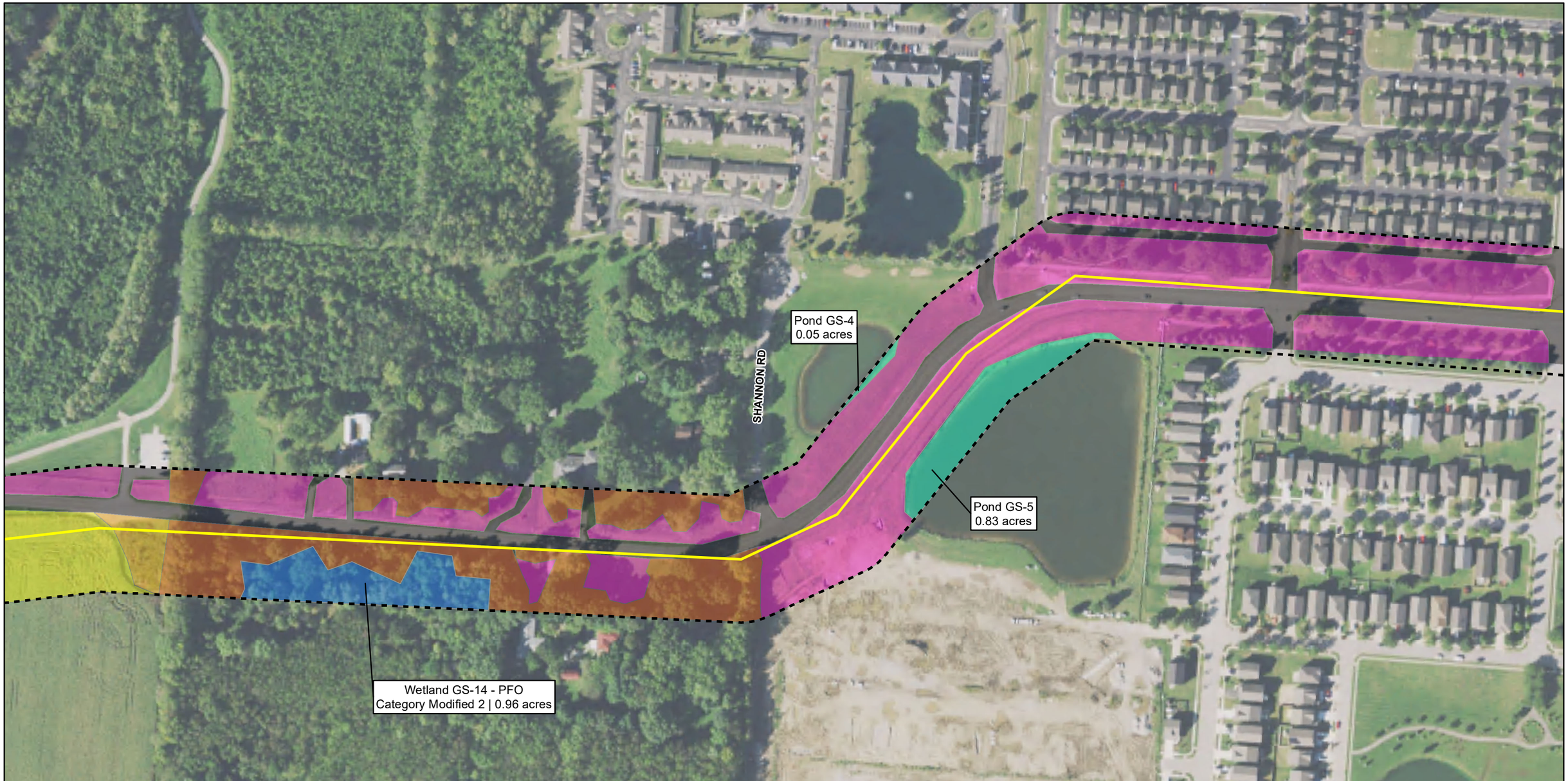


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

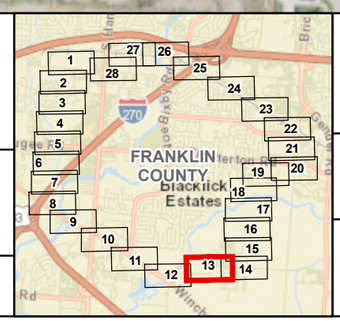


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

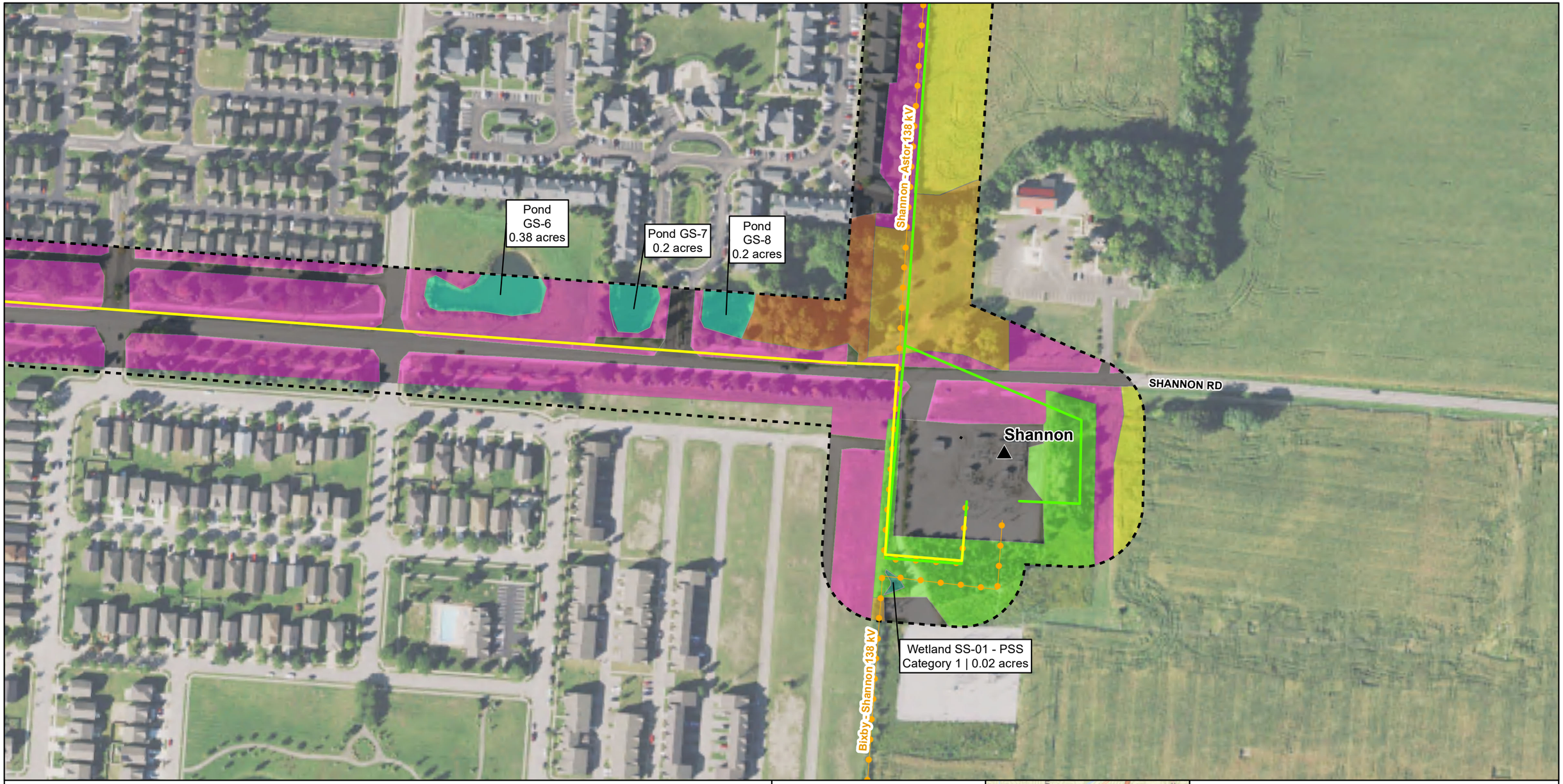


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

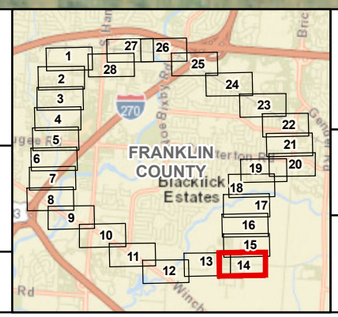


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet



Substation
Culvert
Alternate Route
Preferred Route
Existing Transmission Line
Railroad
Delineated Stream
Non-Jurisdictional Drainage Ditch

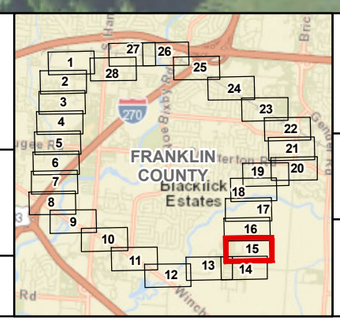
Environmental Survey Corridor
Township Boundary
Municipal Boundary
Agricultural Land
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland
Delineated PUB Wetland
Delineated Pond

Delineated Stream
Landscaped Area
Old Field
Scrub/Shrub
Successional Hardwood Woodland
Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

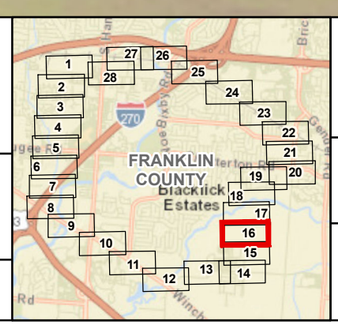


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

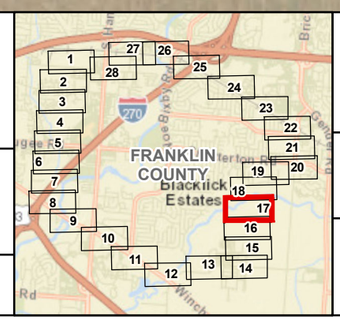


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

Pond AS-2
0.23 acres

Pond AS-1
0.26 acres

Shannon - Astor 138 kV

Wetland AS-02 - PEM
Category 1 | 0.21 acres

Stream AS-07
Perennial | 305 feet
WWH

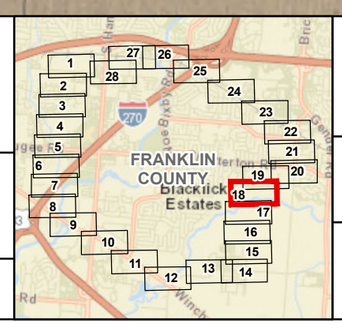
Stream AS-07
Perennial | 222 feet
WWH

- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

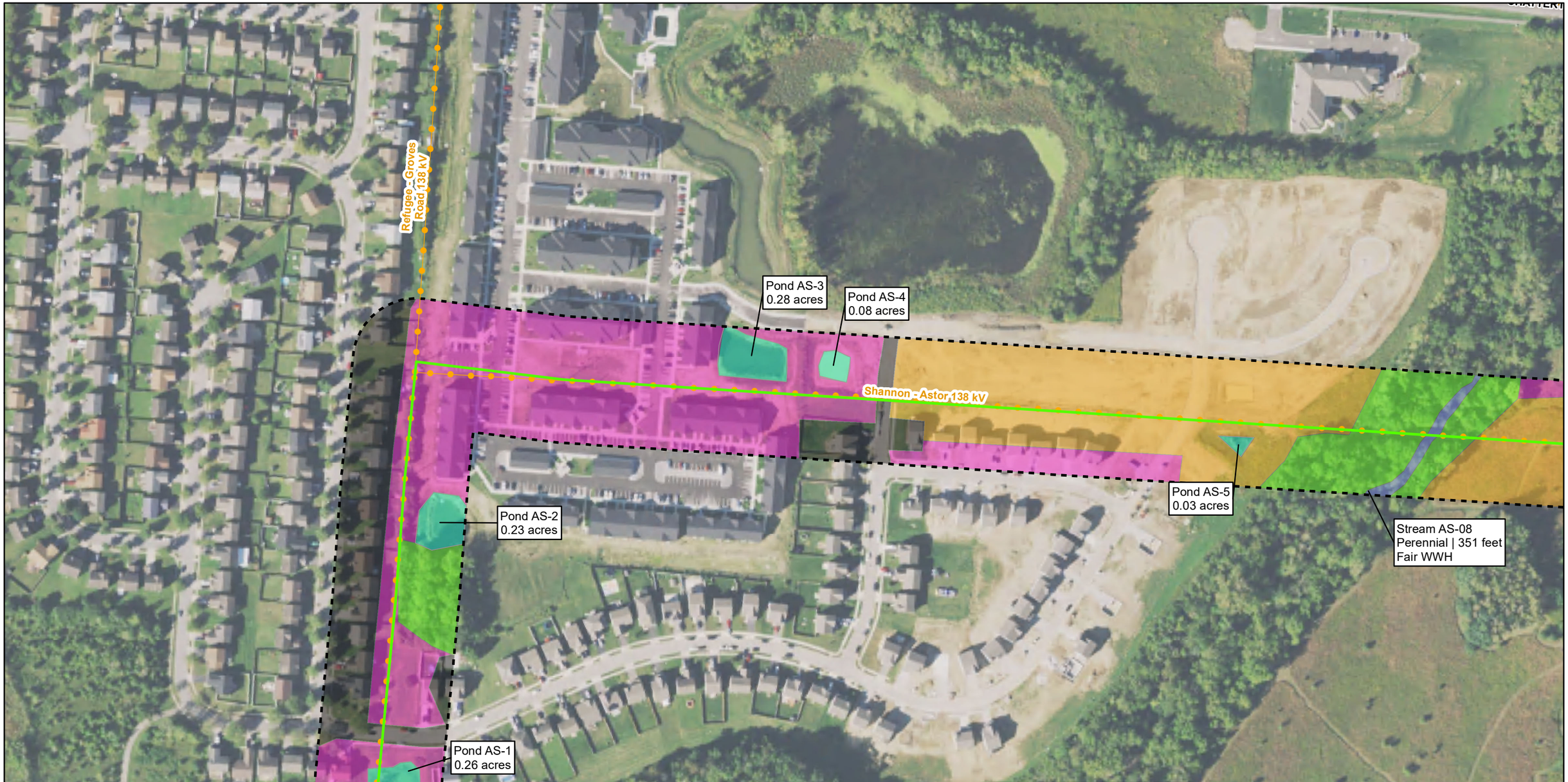


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

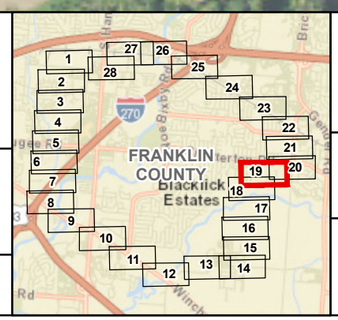


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

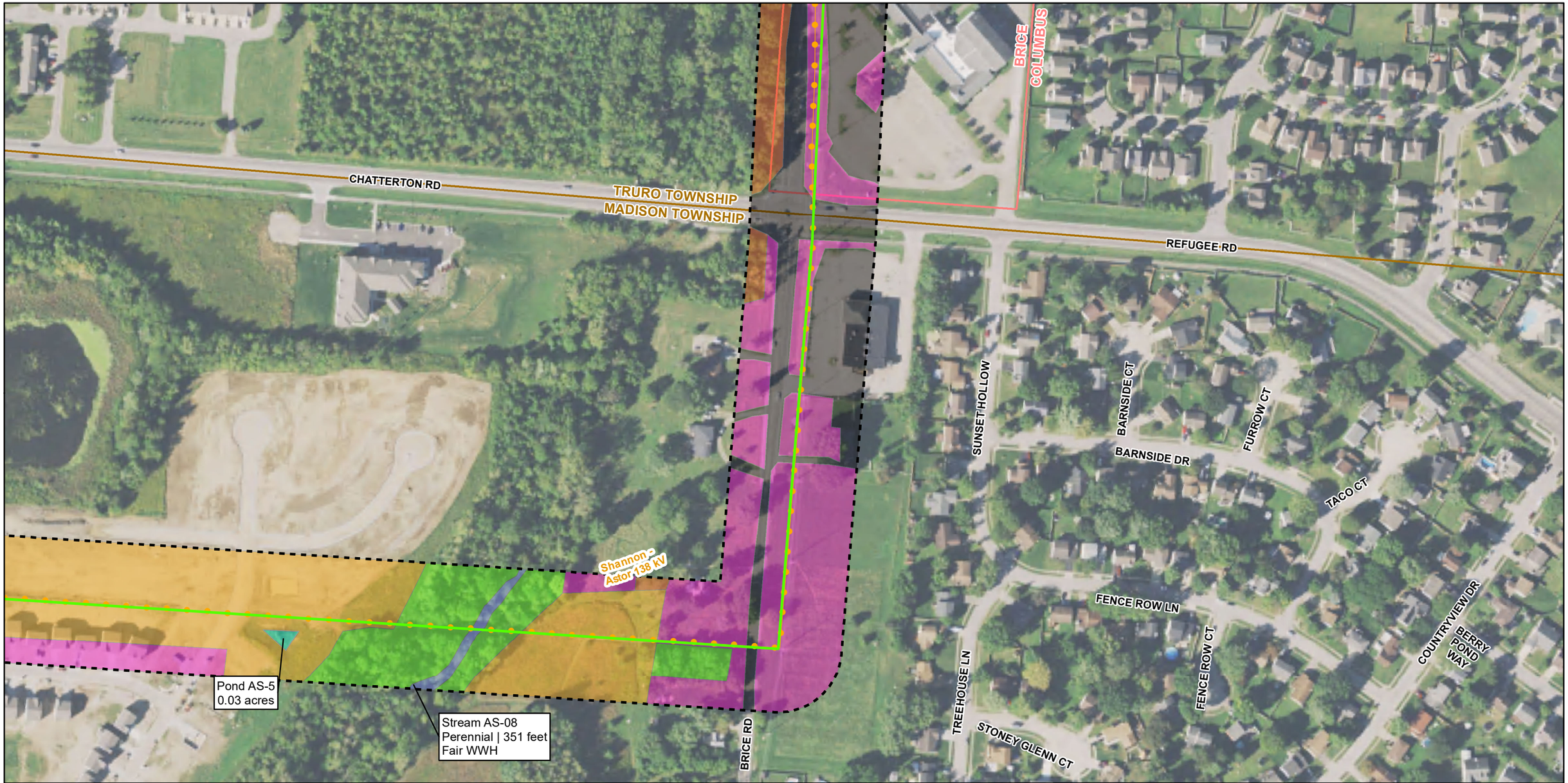


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

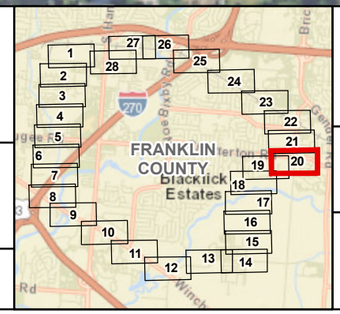


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

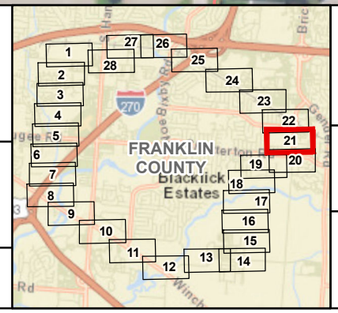


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

AEP OHIO

wsp

N

0 200 400 Feet

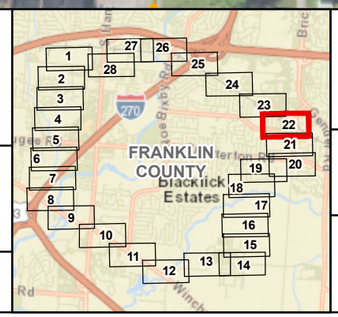


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

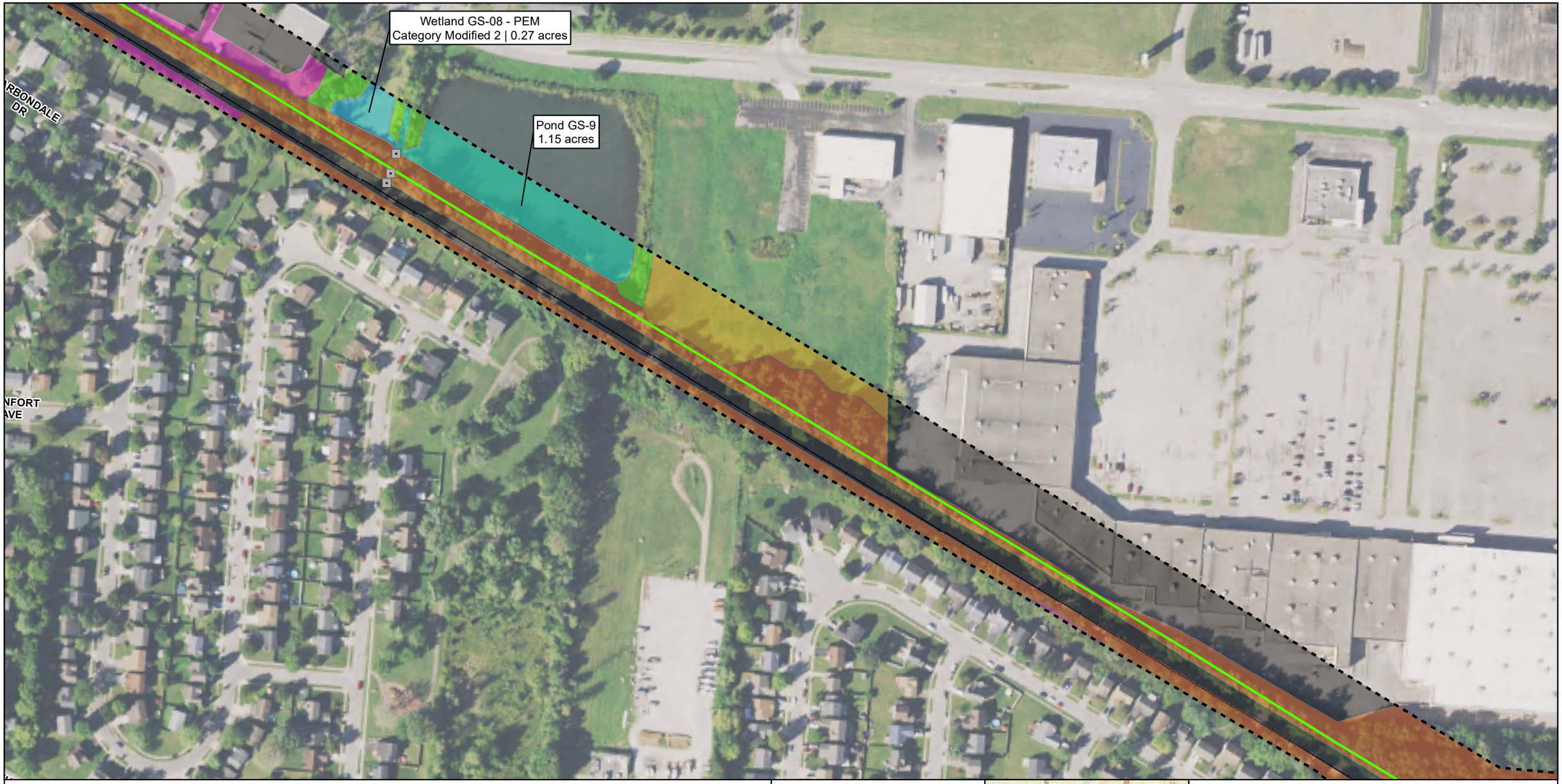
Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

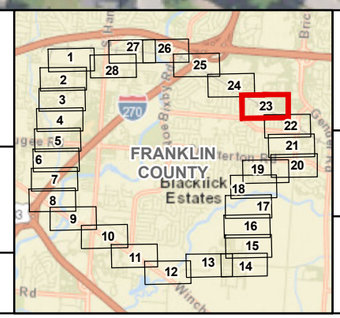


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

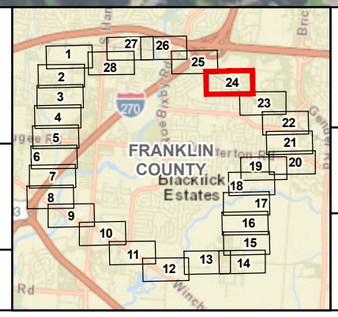


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

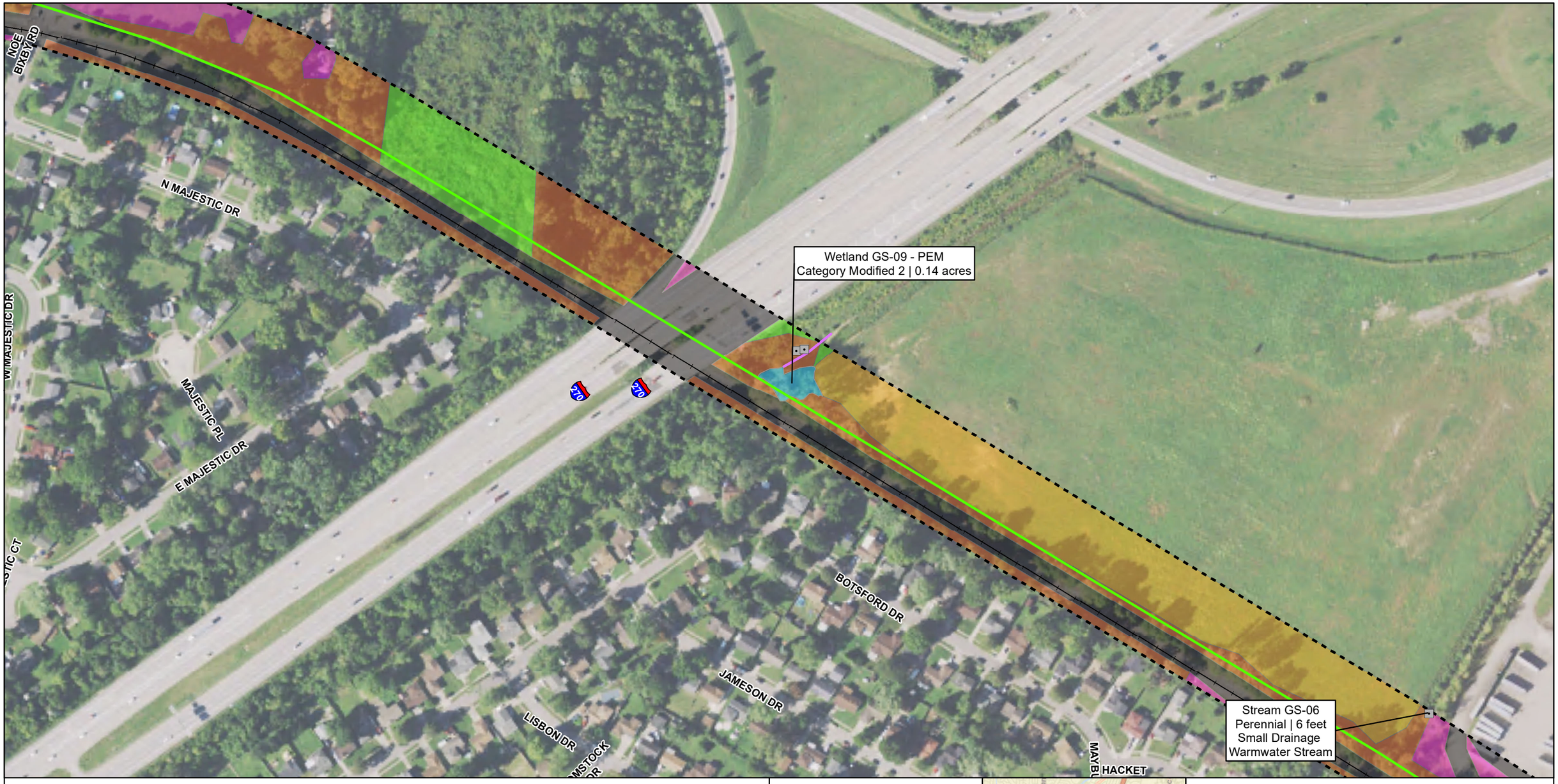


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

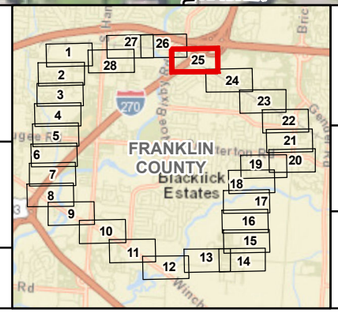


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

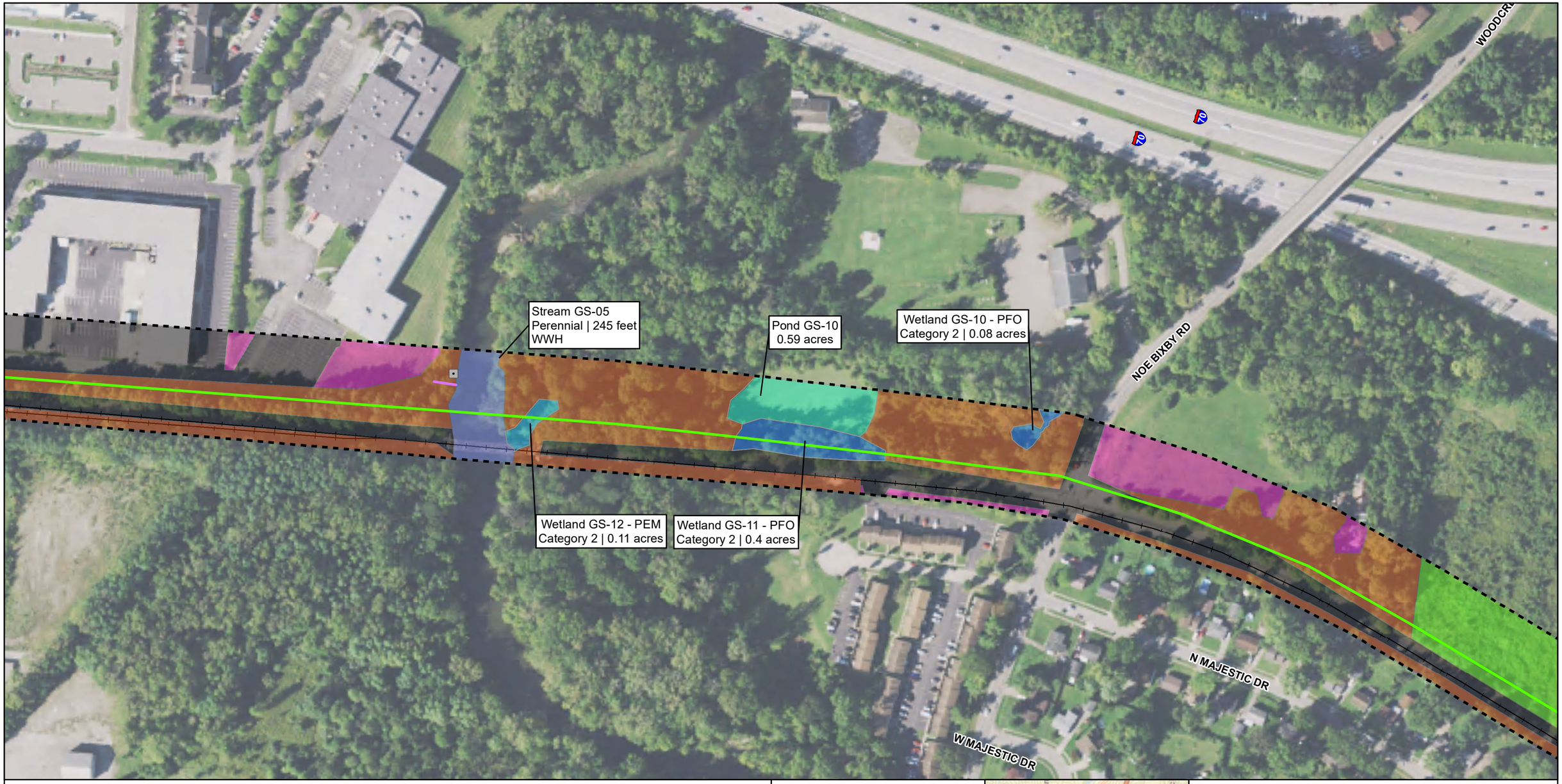


GROVES ROAD - SHANNON 138 KV TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

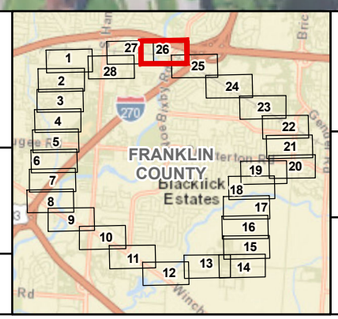


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

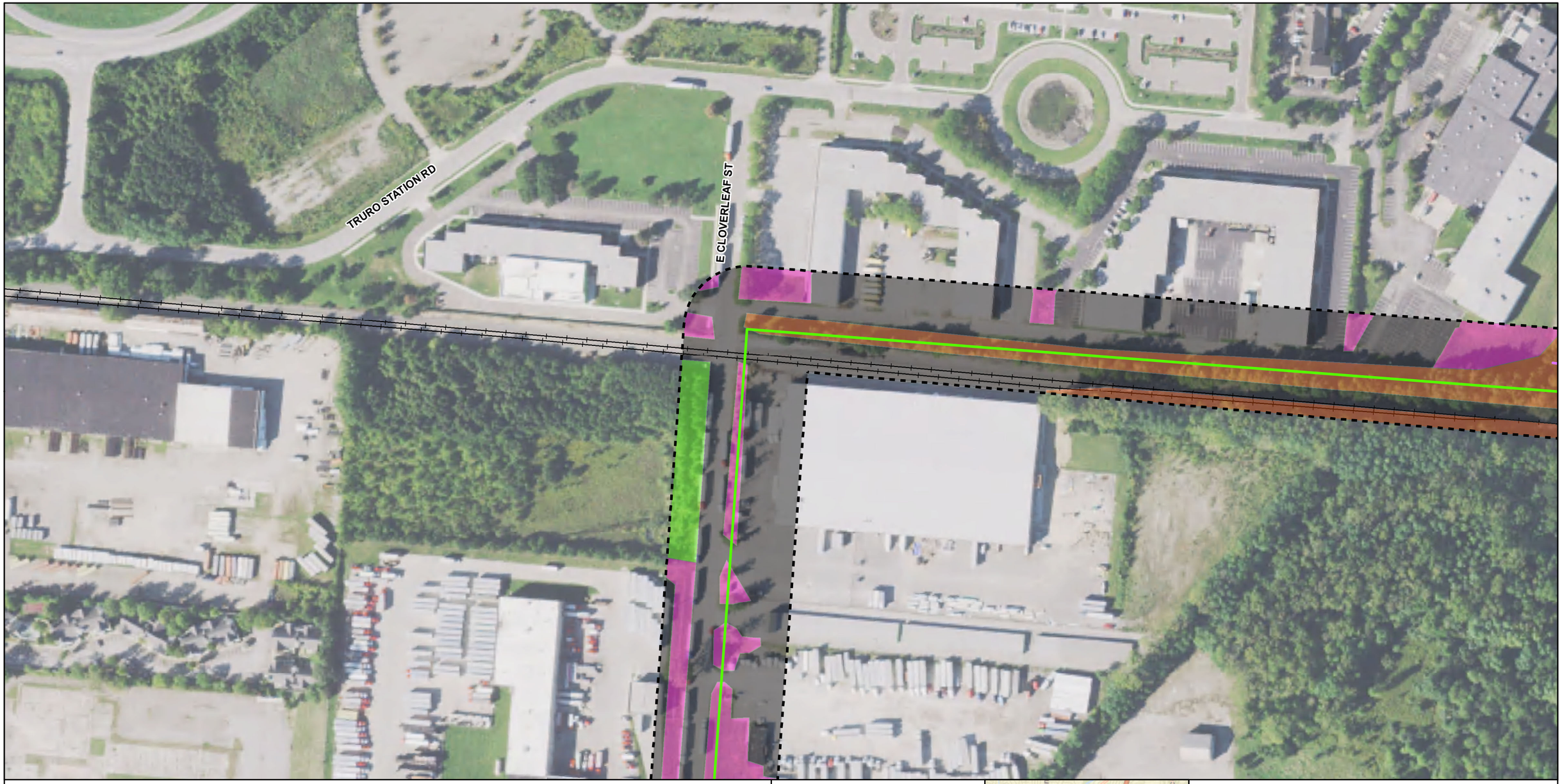


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

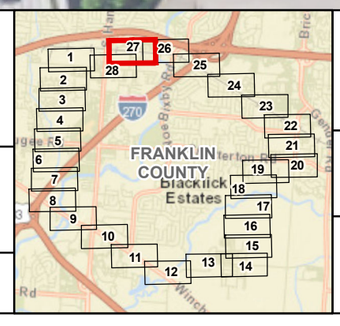


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022

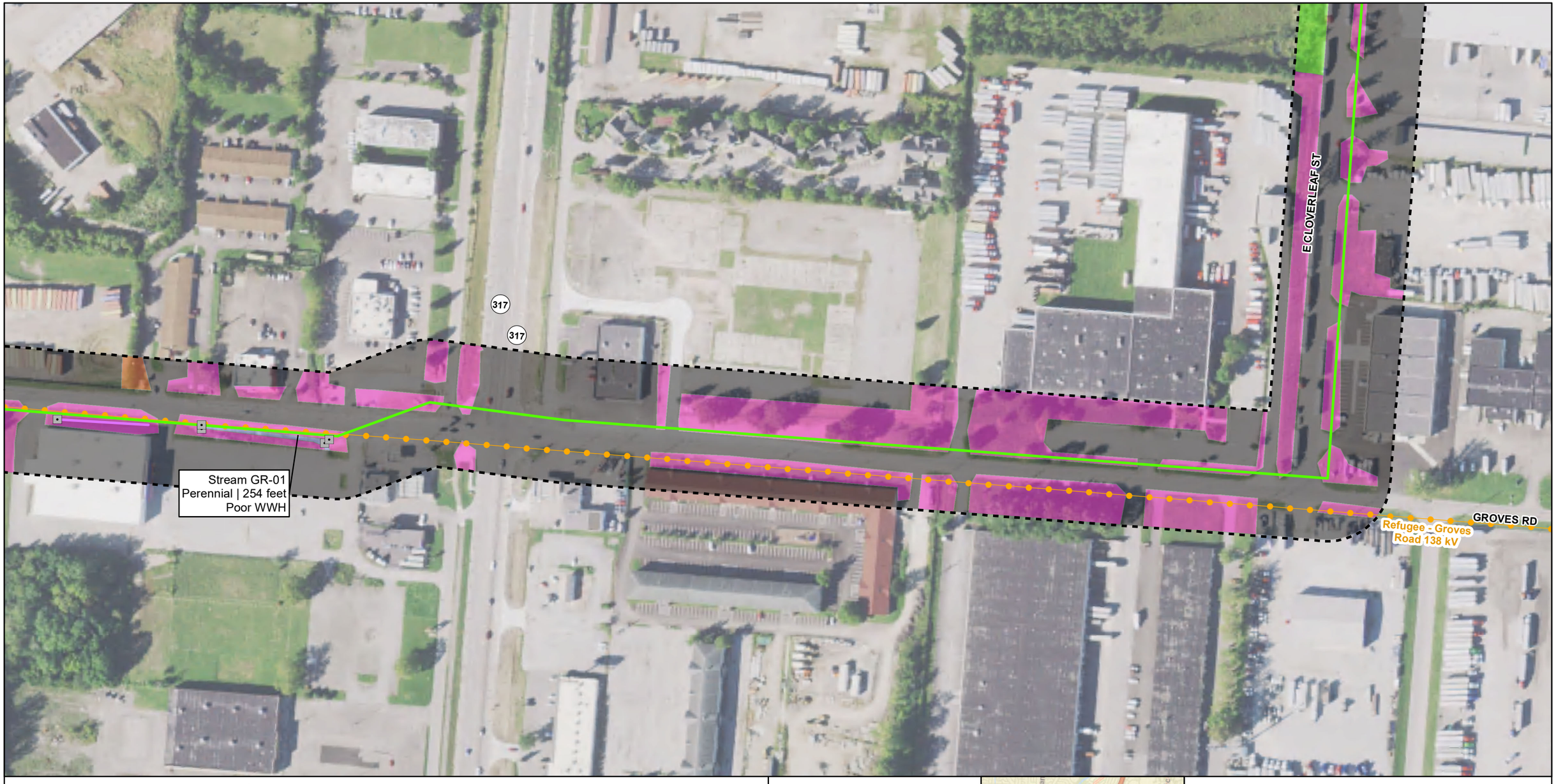


GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

N

0 200 400 Feet

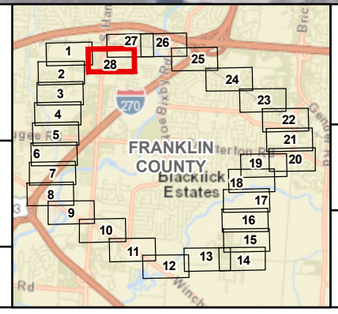


- Substation
- Culvert
- Alternate Route
- Preferred Route
- Existing Transmission Line
- Railroad
- Delineated Stream
- Non-Jurisdictional Drainage Ditch
- Environmental Survey Corridor
- Township Boundary
- Municipal Boundary
- Agricultural Land
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated PUB Wetland
- Delineated Pond
- Delineated Stream
- Landscaped Area
- Old Field
- Scrub/Shrub
- Successional Hardwood Woodland
- Urban

Sources:
NAIP Imagery (USDA 2021)

Coordinate System:
Ohio State Plane South
NAD 1983

February 22, 2022



GROVES ROAD - SHANNON 138 KV
TRANSMISSION LINE PROJECT

Figure 4. Vegetation Coverage

AEP OHIO

WSP

N

0 200 400 Feet

Appendix B.

Reference Tables

Table 1. NRCS Soil Map Units in the ESC			
Symbol	**Soil Map Unit Name and Description**	**Hydric Rating[1]**	**Hydric %**
AdC2	Alexandria silt loam, 6 to 12 percent slopes, eroded	5	AdC2
AdD2	Alexandria silt loam, 12 to 18 percent slopes, eroded	0	AdD2
BeA	Bennington silt loam, 0 to 2 percent slopes	8	BeA
BeB	Bennington silt loam, 2 to 6 percent slopes	6	BeB
CbB	Cardington-Urban land complex, 2 to 6 percent slopes	10	CbB
CeB	Celina silt loam, 2 to 6 percent slopes	10	CeB
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	5	CrA
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	5	CrB
Crd1B1	Cardington silt loam, 2 to 6 percent slopes	7	Crd1B1
Ee	Eel silt loam, 0 to 2 percent slopes, occasionally flooded	4	Ee
ElC2	Eldean silt loam, 6 to 12 percent slopes, eroded	0	ElC2
EmB	Eldean-Urban land complex, 2 to 6 percent slopes	5	EmB
Gn	Genesee silt loam, 0 to 2 percent slopes, occasionally flooded	6	Gn
KeB	Kendallville silt loam, 2 to 6 percent slopes	0	KeB
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	90	Ko
Mh	Medway silt loam, occasionally flooded	5	Mh
MkB	Miamian silt loam, 2 to 6 percent slopes	5	MkB
MlC2	Miamian silty clay loam, 6 to 12 percent slopes, eroded	5	MlC2
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	0	OcB
Pm	Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes	94	Pm
Rs	Ross silt loam, 0 to 2 percent slopes, occasionally flooded	6	Rs
Sh	Shoals silt loam, occasionally flooded	5	Sh
SlA	Sleeth silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	5	SlA
So	Sloan silt loam, Columbus Lowland, 0 to 2 percent slopes, frequently flooded	85	So
ThA	Thackery silt loam, 0 to 2 percent slopes	5	ThA
ThB	Thackery silt loam, 2 to 6 percent slopes	5	ThB
Ur	Udorthents, loamy, sloping	0	Ur
Us	Udorthents, loamy, steep	0	Us
Ut	Udorthents-Urban land complex, gently rolling	0	Ut
Uu	Urban land-Bennington complex, 0 to 6 percent slopes	6	Uu
W	Water	0	W
Wt	Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes	90	Wt

[1] Not Hydric = 0% hydric soil component, Predominantly Not Hydric = 1-32%, Partially Hydric =33-65%, Predominantly Hydric = 66-99%, and All Hydric = 100

Table 2. Wetlands Delineated Within the ESC									
Wetland ID	**Location**		**Wetland Type[1]**	**Delineated Acreage[2]**	**ORAM**		**USACE Jurisdictional**	**Floodplain (Yes/No)**	**Proximal Waterbody**
	Latitude	**Longitude**			**Score**	**Category**			
Wetland GS-01	-82.889800	39.921800	PEM/PFO	0.47	28	1	No	No	No Proximal Waterbody
Wetland GS-02	-82.890700	39.914300	PEM/PSS	1.26	36	Modified 2	Yes	Yes	Stream GS-1 (Mason Run)
Wetland GS-03	-82.891200	39.910100	PEM/PFO	0.35	40	Modified 2	Yes	Yes	Stream GS-1 (Mason Run)
Wetland GS-05	-82.892200	39.906100	PEM/PUB	0.07	35	Modified 2	Yes	Yes	Stream GS-03 (Big Walnut Creek)
Wetland GS-06	-82.884600	39.900000	PSS	0.13	34	1 or 2 Grey Zone	Yes	Yes	Stream GS-03 (Big Walnut Creek)
Wetland GS-07	-82.842900	39.900000	PEM	0.05	16	1	Yes	Yes	Stream GS-04 (Blacklick Creek)
Wetland GS-08	-82.843000	39.924600	PEM	0.21	41	Modified 2	No	No	Pond GS-09
Wetland GS-09	-82.856700	39.930700	PEM	0.14	43	Modified 2	No	No	No Proximal Waterbody
Wetland GS-10	-82.862500	39.933100	PFO	0.07	55	2	Yes	Yes	Stream GS-05 (Big Walnut Creek)
Wetland GS-11	-82.864200	39.933100	PFO	0.40	48	2	Yes	Yes	Stream GS-05 (Big Walnut Creek)
Wetland GS-12	-82.866200	39.933100	PEM	0.11	56	2	Yes	Yes	Stream GS-05 (Big Walnut Creek)
Wetland GS-13	-82.888900	39.932800	PEM	0.13	18	1	No	No	No Proximal Waterbody
Wetland GS-14	-82.856500	39.891800	PFO	0.95	43	Modified 2	Yes	Yes	Stream GS-04 (Blacklick Creek)
Wetland SS-01	-82.844046	39.891940	PSS	0.02	12.5	1	Yes	Yes	Stream AS-7 (Blacklick Creek)
Wetland AS-02	-82.843800	39.896260	PEM	0.21	20.5	1	Yes	Yes	Stream AS-7 (Blacklick Creek)
Wetland AS-03	-82.843700	39.906820	PEM	0.47	22.5	1	Yes	Yes	Stream AS-7 (Blacklick Creek)
			Sum of PEM Wetland Areas	2.64					
			Sum of PSS Wetland Areas	0.45					
			Sum of PFO Wetland Areas	1.89					
			Sum of PUB Wetland Areas	0.06					
			Total Wetland Area	**5.04**					

[1]PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested, PUB = palustrine unconsolidated bottom (pond).
[2]Acreage reflect the area delineated within the approximately 330.4-acre ESC, are approximate based on sub-decimeter accurate GPS data, and are rounded to two decimals.

Table 3. Streams Delineated within the ESC											
Stream ID	**Location**		**Stream Name**	**Stream Type**	**Delineated Length (feet)**	**Bankfull Width (feet)**	**OHWM Width (feet)**	**Field Evaluation**			**Ohio EPA 401 Eligibility**
	Latitude	**Longitude**						**Method**	**Score**	**Class/ Designation**	
Stream GS-01	39.914700	-82.890400	Mason Run	Perennial	1,115	30	20	N/A	N/A	Warmwater Habitat	Possibly Eligible / Ineligible
Stream GS-02	39.910200	-82.891300	UNT to Mason Run	Intermittent	221	5	3	HHEI	40	Small Drainage Warmwater Stream	Possibly Eligible / Ineligible
Stream GS-03	39.902900	-82.889500	Big Walnut Creek	Perennial	334	115	95	N/A	N/A	Warmwater Habitat	Ineligible
Stream GS-04	39.890700	-82.863500	Blacklick Creek	Perennial	383	60	100	N/A	N/A	Warmwater Habitat	Possibly Eligible
Stream GS-05	39.933200	-82.866800	Big Walnut Creek	Perennial	276	160	120	N/A	N/A	Warmwater Habitat	Ineligible
Stream GS-06	39.928900	-82.851900	UNT to Big Walnut Creek	Perennial	22	10	6	HHEI	40	Small Drainage Warmwater Stream	Ineligible
Stream AS-06	39.910470	-82.834950	UNT to Blacklick Creek	Perennial	350	26	22	QHEI	43	Fair Warmwater Habitat	Possibly Eligible
Stream AS-07	39.906348	-82.843652	Blacklick Creek	Perennial	526	140	120	N/A	N/A	Warmwater Habitat	Possibly Eligible
Stream AS-08	39.915383	-82.833081	UNT to Blacklick Creek	Perennial	1,140	24	10	QHEI	47	Fair Warmwater Habitat	Possibly Eligible
Stream GR-01	39.930190	-82.881050	UNT to Big Walnut Creek	Perennial	254	12	9	QHEI	35	Poor Warmwater Habitat	Ineligible
				Length of Perennial Streams	4,400						
				Length of Intermittent Streams	221						
				Length of Ephemeral Streams	0						
				Total Length of Streams in ESC	**4,621**						

Notes: UNT = unnamed tributary, WWH = Warmwater Habitat (per OAC 3745-1-11), MHW = Modified Warmwater Habitat (per OAC 3745-1-11), S&R = Scenic and Recreational River (per ODNR Ohio Scenic Rivers Program). Lengths are approximate based on GPS data and are rounded to the nearest foot.

Table 4. Ponds Delineated within the ESC				
Stream ID	**Location**		**Delineated Area (Acres)[1]**	**WOUS**
	Latitude	**Longitude**		
Pond GS-01	-82.890370	39.917850	0.43	No
Pond GS-02	-82.891730	39.909930	0.09	No
Pond GS-03	-82.884540	39.899940	0.34	No
Pond GS-04	-82.852810	39.892960	0.05	No
Pond GS-05	-82.851850	39.892740	0.83	No
Pond GS-06	-82.847030	39.893590	0.38	No
Pond GS-07	-82.845960	39.893540	0.20	No
Pond GS-08	-82.845280	39.893510	0.20	No
Pond GS-09	-82.841870	39.924090	1.15	No
Pond GS-10	-82.864200	39.933260	0.59	No
Pond GS-11	-82.883290	39.930050	0.14	No
Pond GS-12	-82.887500	39.930320	0.12	No
Pond AS-01	-82.842480	39.908370	0.26	No
Pond AS-02	-82.842190	39.909930	0.23	No
Pond AS-03	-82.839920	39.910870	0.28	No
Pond AS-04	-82.839320	39.910810	0.08	No
Pond AS-05	-82.836370	39.910380	0.03	No
Total Acreage of Ponds in ESC 5.40				

[1] Acreages reflect the area delineated within the ESC and are approximate based on GPS data and are rounded to the nearest 0.01-acre.

Table 5. Listed Species Commented on by ODNR and USFWS						
Common Name (Scientific Name)	**State Status**	**Federal Status**	**Habitat Description**	**Potential Habitat Observed in ESC**	**Agency Comments**	**Impact Assessment**
Mammals						
Indiana bat (*Myotis sodalis*)	Endangered	Endangered	Winter hibernacula are provided by caves and mines. Summer roost habitat typically includes live or dead trees with exfoliating bark, crevices, or cavities that can be used for roosting. Open sub-canopy areas and flight corridors are important to allow maneuvering during foraging. Proximity to water sources provides a greater density of insect prey.	Yes	The entire state of Ohio is within the range of these species. The DOW recommends tree cutting only occur from October 1 through March 31.	Suitable habitat identified, within Successional Hardwood Woodlands habitat within the ESA. Utilize recommended clearing window (October 1 through March 31).
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Threatened				
Tricolored bat (*Perimyotis subflavus*)	Endangered	Not Listed				
Little brown bat (*Myotis lucifugus*)	Endangered	Not Listed			The project is within the vicinity of records of this species. Because presence has been established in the area, summer tree cutting is not recommended. Limited summer tree cutting inside this buffer may be acceptable after further consultation with DOW.	Suitable habitat identified, within Successional Hardwood Woodlands habitat within the ESA. Further consultation with DOW is recommended, if summer tree clearing is required. Alternatively, utilize recommended clearing window (October 1 through March 31).

Mussels						
Purple cat's paw (*Epioblasma o. obliquata*)	Endangered	Endangered	Commonly inhabits large rivers with sandy gravel substrates. It occurs in water of shallow to moderate depth with a swift current.	Yes	This project must not have an impact on freshwater native mussels at the project site. If in-stream work is anticipated, follow Ohio Mussel Protocol to assess for listed and non-listed mussels. If no in-water work is planned, no adverse effects to these species are anticipated.	If in-water work is proposed, Mussel surveys, per the Ohio Mussel Protocol are recommended, in streams with proposed impacts. If no in water work is planned, no adverse effects to these species are anticipated.
Clubshell (*Pleurobema clava*)	Endangered	Endangered	Habitat is typically provided by streams and small rivers with well-oxygenated riffles and sand and gravel substrates.	Yes		
Northern riffleshell (*Epioblasma torulosa rangiana*)	Endangered	Endangered	Habitat is typically provided by large streams and small rivers in firm sand of riffle areas.	Yes		
Rayed bean (*Villosa fabalis*)	Endangered	Endangered	Habitat is typically provided by smaller, headwater creeks, but they are sometimes found in large rivers.	Yes		
Snuffbox (*Epioblasma triquetra*)	Endangered	Endangered	Typically found in small to medium-sized creeks and some larger rivers, in areas with a swift current.	Yes		
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	Threatened	Threatened	Typically, occurs in a variety of flowing water habitats including small to medium-sized streams and some larger navigable rivers. It usually occurs in shallow areas along the bank.	Yes		
Elephant-ear (*Elliptio crassidens crassidens*)	Endangered	Not Listed	Primarily inhabits large rivers in mud, sand or fine gravel.	Yes		
Long solid (*Fusconaia maculata maculate*)	Endangered	Not Listed	Typically, found in small to large rivers in gravel with a strong current.	Yes		
Ohio pigtoe (*Pleurobema cordatum*)	Endangered	Not Listed	Commonly found in strong currents on substrates of sand and gravel.	Yes		
Pocketbook (*Lampsilis ovata*)	Endangered	Not Listed	Creeks to large rivers with quiet to swift current in gravel, sand and cobble — nearly any substrate except for moving sand.	Yes		

Washboard (*Megalonaias nervosa*)	Endangered	Not Listed	Typically, a large river species, inhabiting the main channel areas of a stream. Suitable habitat consists of slow current areas with substrates composed of sand, gravel, or mud.	Yes	This project must not have an impact on freshwater native mussels at the project site. If in-stream work is anticipated, follow Ohio Mussel Protocol to assess for listed and non-listed mussels. If no in-water work is planned, no adverse effects to these species are anticipated.	If in-water work is proposed, Mussel surveys, per the Ohio Mussel Protocol are recommended, in streams with proposed impacts. If no in water work is planned, no adverse effects to these species are anticipated.
Black sandshell (*Ligumia recta*)	Threatened	Not Listed	most commonly occupies rivers with strong currents and lakes with a firm substrate of gravel or sand.	Yes		
Fawnsfoot (*Truncilla donaciformis*)	Threatened	Not Listed	Typically occurs in flowing areas of large rivers in soft or coarse substrate.	Yes		
Pondhorn (*Uniomerus tetralasmus*)	Threatened	Not Listed	This species is typically found in ponds, small creeks, and headwater streams with sand or mud substrates.	Yes		
Threehorn wartyback (*Obliquaria reflexa*)	Threatened	Not Listed	Typically found in large rivers with moderate current and stable gravel, sand and mud bottoms.	Yes		
Elktoe (*Alasmidonta marginate*)	Species of Conern	Not Listed	This species is usually found in larger creeks the upper reaches of rivers in mixed sands and gravel substrates.	Yes		
Wavy-rayed lampmussel (*Lampsilis Fasciola*)	Species of Conern	Not Listed	Typically occurs in small-medium sized shallow streams, in and near riffles, with good current. It rarely occurs in medium rivers.	Yes		
Fish						
Scioto madtom (*Noturus trautmani*)	Endangered	Endangered	prefers stream riffles of moderate current over gravel bottoms. Water must be of high quality and free of suspended sediments.	Yes	ODNR has recommended in-water work restriction dates of March 15th to June 30th in perennial streams. If not in-water work is proposed in perennial streams, the Project is not likely to impact these species.	If in-water work cannot be avoided, recommend working outside of in-water work restriction dates of March 15th through June 30th, in perennial streams.
goldeye (*Hiodon alosoid*es)	Endangered	Not Listed	It prefers turbid slower-moving waters of lakes and rivers.	Yes		

Iowa darter (*Etheostoma exile*)	Endangered	Not Listed	Occurs in clear to lightly turbid water in small cool lakes, bogs, ponds, and in slow-moving waters of small brooks to medium rivers	Yes	ODNR has recommended in-water work restriction dates of March 15th to June 30th in perennial streams. If not in-water work is proposed in perennial streams, the Project is not likely to impact these species.	If in-water work cannot be avoided, recommend working outside of in-water work restriction dates of March 15th through June 30th, in perennial streams.
Popeye shiner (*Notropis ariommus*)	Endangered	Not Listed	Primarily inhabits slowly or moderately flowing rivers or creeks.	Yes		
Northern brook lamprey (*Ichthyomyzon fossor*)	Endangered	Not Listed	Typically found in the headwaters of streams that are moderately warm and clean.	Yes		
spotted darter (*Etheostoma maculatum*)	Endangered	Not Listed	Lives in freshwater rivers that are typically marked with the presence of boulders and other rocks.	Yes		
Shortnose gar (*Lepisosteus platostomus*)	Endangered	Not Listed	Primarily found in large rivers and associated overflow ponds and backwaters.	Yes		
Tonguetied minnow *(Exoglossum laurae)*	Endangered	Not Listed	Lives in clean rock river bottommost, in forested reaches of cool rivers.	Yes		
Lake chubsucker *(Erimyzon sucetta)*	Threatened	Not Listed	Found in natural lakes and slow-water sections of large streams. These waters are usually clear, vegetated and have sandy or fine graveled bottoms	Yes		
Paddlefish (*Polyodon spathula*)	Threatened	Not Listed	This species is typically found in water deeper than 1.3 m in large river basins and their tributaries.	Yes		
Tippecanoe darter (*Etheostoma tippecanoe*)	Threatened	Not Listed	Most commonly in medium to large streams and rivers.	Yes		

Birds						
American Bittern (*Botaurus lentiginosus*)	Endangered	Not Listed	This species prefers large undisturbed wetlands that have scattered small pools amongst dense vegetation. However, occasionally occupy bogs, large wet meadows, and dense swamps.	No	ODNR has recommended that potential nesting habitat be avoided during the May 1st to July 31st nesting period.	No suitable habitat was observed for these species. No adverse effects to this species or its habitat are anticipated.
Black-crowned night-heron (*Nycticorax nycticorax*),	Threatened	Not Listed	Wide variety of aquatic habitats, around both fresh and saltwater, including marshes, rivers, ponds, and canals. Nests in groves of trees, in thickets, or on ground, usually on islands or above water, perhaps to avoid predators.	No		
Cattle egret (*Bubulcus ibis*)	Endangered	Not Listed	Widespread in any kind of open country, including pastures, plowed fields, lawns, roadsides. Also, in aquatic habitats, including flooded fields, marshes. Nests in trees or shrubs, in colonies with other wading birds	No	ODNR has recommended that potential nesting habitat be avoided during the May 15th to August 15th nesting period.	
Lark sparrow (*Chondestes grammacus*)	Endangered	Not Listed	Breed in open grassy habitats with scattered trees and shrubs including orchards, fallow fields, open woodlands, and grasslands.	No	ODNR has recommended that potential nesting habitat be avoided during the May 1st to July 31st nesting period.	
Least bittern (*Ixobrychus exilis*)	Threatened	Not Listed	Often found in freshwater or brackish marshes with tall grasses, cattails, and reeds.	No		
Northern Harrier (*Circus hudsonis*)	Endangered	Not Listed	This species is occasionally known to breed in large marshes and grasslands.	No	ODNR has recommended that potential nesting habitat be avoided during the April 15th to July 31st nesting period.	
Sandhill crane (*Grus canadensis*)	Threatened	Not Listed	Breed and forage in open prairies, grasslands, and wetlands. Outside of the breeding season, they often roost in deeper water of ponds or lakes, where they are safe from predators	No	ODNR has recommended that potential nesting habitat be avoided during the April 15st to August 31st nesting period.	
Upland sandpiper (*Bartramia longicauda*)	Endangered	Not Listed	Nesting habitat is provided in grasslands, pastures, and old-field areas.	No		

Appendix C.

USACE Wetland Determination Forms –

Midwest Region

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-01a

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes (Pm) NWI classification: PEM1F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Depressional PFO/PEM complex, partially within existing transmission line ROW.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum*	25	Yes	FACW
2. *Quercus palustris*	25	Yes	FACW
3. *Populus deltoides*	10	No	FAC
4.			
5.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland GS-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	90	5YR 4/4	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-01b

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes (Pm) NWI classification: PEM1F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Depressional PFO/PEM complex, partially within existing transmission line ROW.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. *Acer saccharinum*	25	Yes	FACW
2.			
3.			
4.			
5.			
	25 =Total Cover		
Herb Stratum (Plot size:)			
1. *Phalaris arundinacea*	60	Yes	FACW
2. *Persicaria bicornis*	10	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: /etland GS-0

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	95	5YR 4/4	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-1

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): concave

Slope (%): 1 Lat: 39.922092 Long: -82.889798 Datum: WGS 84

Soil Map Unit Name: Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes (Pm) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No ____	
Wetland Hydrology Present?	Yes ____	No ____	

Remarks:
Upland data point corresponding to Wetland GS-01 (PEM/PFO).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: ____)			
1. Phleum pratense	25	Yes	FACU
2. *Solidago canadensis*	25	Yes	FACU
3. *Vernonia gigantea*	15	No	FAC
4. *Geum canadense*	5	No	FAC
5. *Cirsium vulgare*	5	No	FACU
6. *Trifolium repens*	5	No	FACU
7.			
8.			
9.			
10.			
	80 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	80 (A)		300 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 5/4	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock / Fill

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-02a

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Shoals silt loam, occasionally flooded (Sh) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Depressional PEM/PSS complex, within the 100-year floodplain of Mason Run, in an existing transmission line ROW.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. *Fraxinus pennsylvanica*	15	Yes	FACW
2. *Salix nigra*	10	Yes	OBL
3. *Populus deltoides*	5	No	FAC
4.			
5.			
	30 =Total Cover		
Herb Stratum (Plot size:)			
1. *scripus atroviens*	25	Yes	OBL
2. *leersia oryzoides*	20	Yes	OBL
3. *juncus tenuis*	15	Yes	FAC
4. *carex squarrosa*	10	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	70 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: /etland GS-0

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	95	5YR 4/4	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-02b

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 2 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Shoals silt loam, occasionally flooded (Sh) NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? **Yes** X **No**

Remarks:
Depressional PEM/PSS complex, within the 100-year floodplain of Mason Run, in an existing transmission line ROW.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. *Fraxinus pennsylvanica*	35	Yes	FACW
2. *Acer negundo*	10	Yes	OBL
3. *Salix nigra*	5	No	FAC
4.			
5.			
	50 =Total Cover		
Herb Stratum (Plot size:)			
1. *Acorus americanus*	50	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland GS-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	90	5YR 4/4	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-2

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Thackery silt loam, 2 to 6 percent slopes (ThB) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No x	**Is the Sampled Area within a Wetland?** **Yes** **No** x
Hydric Soil Present?	Yes	No x	
Wetland Hydrology Present?	Yes	No x	

Remarks:
Depressional PEM/PSS complex, within the 100-year floodplain of Mason Run, in an existing transmission line ROW.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size:)			
1. *Ambrosia artemisiifolia*	35	Yes	FACU
2. *Solidago canadensis*	30	Yes	FACU
3. *Poa annua*	15	No	FACU
4. *juncus tenuis*	10	No	FAC
5. *Leucanthemum vulgare*	5	No	UPL
6.			
7.			
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	80	x 4 =	320
UPL species	5	x 5 =	25
Column Totals:	95 (A)		375 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland GS-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/4	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fill/Gravel

Depth (inches): 8

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of hydrology were observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/28/2021

Applicant/Owner: AEP State: OH Sampling Point: GS-03b

Investigator(s): SM, BR Section, Township, Range: S 4, T 11N, R 21W

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave

Slope (%): 3 Lat: 39.909994 Long: -82.891174 Datum: WGS 84

Soil Map Unit Name: Sh - Shoals silt loam, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-03b for PEM portion of Wetland 3 complex. Wetland is located in 100-year floodplain of Blacklick Creek and adjacent west of Mason Run.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Salix interior*	15	Yes	FACW
2. *Acer rubrum*	5	No	FAC
3. *Fraxinus pennsylvanica*	3	No	FACW
4. *Acer negundo*	3	No	FAC
5.			
	26 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	70	Yes	FACW
2. *Solidago gigantea*	15	No	OBL
3. *Rumex crispus*	10	No	FAC
4. *Solidago gigantea*	10	No	FACW
5. *Ambrosia trifida*	5	No	FAC
6.			
7.			
8.			
9.			
10.			
	110 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. *Vitis riparia*	30	Yes	FACW
2. *Convolvulus arvensis*	10	Yes	UPL
	40 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	128	x 2 =	256
FAC species	23	x 3 =	69
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	176 (A)		390 (B)
Prevalence Index = B/A =			2.22

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-03b meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW.

SOIL

Sampling Point: GS-03b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	90	10YR 5/6	10	C	PL/M	Loamy/Clayey	
3-16	10YR 3/1	60	10YR 5/6	40	C	M		Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes X No ___ Depth (inches): 10

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as saturation (10 inches) and oxidized rhizospheres on living roots. Secondary hydrology indicators present as geomorphic position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon | City/County: Franklin | Sampling Date: 6/28/2021

Applicant/Owner: AEP | State: OH | Sampling Point: GS-03a

Investigator(s): SM, BR | Section, Township, Range: S 5, T 11N, R 21W

Landform (hillside, terrace, etc.): floodplain | Local relief (concave, convex, none): concave

Slope (%): 3 | Lat: 39.910618 | Long: -82.891236 | Datum: WGS 84

Soil Map Unit Name: Sh - Shoals silt loam, occasionally flooded | NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-03a for PFO portion of Wetland 3 complex. Wetland is located in 100-year floodplain of Blacklick Creek and adjacent west of Mason Run.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	20	Yes	FAC
2. *Fraxinus pennsylvanica*	15	Yes	FACW
3. *Acer rubrum*	10	No	FAC
4. *Carpinus caroliniana*	10	No	FAC
5.			
	55	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	30	Yes	FACW
2.			
3.			
4.			
5.			
	30	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Festuca rubra*	20	Yes	FACU
2. *Solidago gigantea*	15	Yes	FACW
3. *Rubus allegheniensis*	10	No	FACU
4. *Boehmeria cylindrica*	10	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	55	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Toxicodendron radicans*	15	Yes	FAC
2. *Vitis riparia*	10	Yes	FACW
	25	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	70	x 2 =	140
FAC species	55	x 3 =	165
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	165 (A)		435 (B)
Prevalence Index = B/A =			2.64

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-03a meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FAC, FACW, and FACU.

SOIL

Sampling Point: GS-03a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	60	10YR 5/6	40	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 8

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as saturation and water-stained leaves. Secondary hydrology indicators present as geomorphic position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/28/2021

Applicant/Owner: AEP State: OH Sampling Point: GS-03ab

Investigator(s): SM, BR Section, Township, Range: S 4, T 11N, R 21W

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): convex

Slope (%): 2 Lat: 39.910871 Long: -82.891023 Datum: WGS 84

Soil Map Unit Name: Sh - Shoals silt loam, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ____
Hydric Soil Present?	Yes ____	No ____	
Wetland Hydrology Present?	Yes ____	No ____	

Remarks:
Sample point GS-03ab, upland point for PFO/PEM wetland complex (GS-03a and GS-03b). Located in 100-year floodplain of Blacklick Creek. Sample point does not meet any wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *Elaeagnus umbellata*	10	Yes	UPL
3.			
4.			
5.			
	20 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Solidago altissima*	50	Yes	FACU
2. *Phalaris arundinacea*	30	Yes	FACW
3. *Ranunculus repens*	15	No	FAC
4. *Rubus allegheniensis*	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	110 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. *Convolvulus arvensis*	15	Yes	UPL
2. *Toxicodendron radicans*	5	Yes	FAC
	20 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	65	x 4 =	260
UPL species	25	x 5 =	125
Column Totals:	150 (A)		525 (B)
Prevalence Index = B/A =			3.50

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criteria not met (Dominance Test = 50% and Prevalence Index > 3.0). Dominant species are FACW, UPL, FAC, or FACU.

SOIL

Sampling Point: GS-03ab

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/4	100					Sandy	sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). No hydric soil indicators present throughout entire 16 inch profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/28/2021

Applicant/Owner: AEP State: OH Sampling Point: Upland 4/5

Investigator(s): SM, BR Section, Township, Range: S 5, T 11N, R 21W

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): flat

Slope (%): 0 Lat: 39.906593 Long: -82.892169 Datum: WGS 84

Soil Map Unit Name: Ee - Eel silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Sample point Upland 04 for PEM Wetland 4 and PEM/PUB Wetland 5, located in 100-yr floodplain of Big Walnut Creek. Portions of vegetation have been mowed recently. Sample point does not meet soil or hydrology criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus palustris*	5	Yes	FACW
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Solidago gigantea*	40	Yes	FACW
2. *Ambrosia artemisiifolia*	30	Yes	FACU
3. *Trifolium pratense*	15	No	FAC
4. *Securigera varia*	10	No	UPL
5. *Daucus carota*	5	No	UPL
6. *Viola odorata*	5	No	UPL
7.			
8.			
9.			
10.			
	105	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Toxicodendron radicans*	5	Yes	FAC
2.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	20	x 3 =	60
FACU species	30	x 4 =	120
UPL species	20	x 5 =	100
Column Totals:	115 (A)		370 (B)
Prevalence Index = B/A =			3.22

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample Upland 04 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW, FACU, and FAC.

SOIL

Sampling Point: Upland 4/5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary hydrology indicators present.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/28/2021

Applicant/Owner: AEP State: OH Sampling Point: GS-05

Investigator(s): SM, BR Section, Township, Range: S 5, T 11N, R 21W

Landform (hillside, terrace, etc.): floodplain, depressional Local relief (concave, convex, none): concave

Slope (%): 2 Lat: 39.906314 Long: -82.892248 Datum: WGS 84

Soil Map Unit Name: Ee - Eel silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-05 for PEM/PUB Wetland 5, located in 100-yr Floodplain of Big Walnut Creek. Wetland is located adjacent to area managed by adjacent landscaping company for hunting/tree farm.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *Acer negundo*	10	Yes	FAC
3.			
4.			
5.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Quercus palustris*	5	Yes	FACW
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Juncus tenuis*	30	Yes	OBL
2. *Persicaria virginiana*	15	Yes	FACW
3. *Sagittaria latifolia*	15	Yes	OBL
4. *Lemna minor*	5	No	OBL
5. *Scirpus atrovirens*	5	No	OBL
6. *Phalaris arundinacea*	5	No	FACW
7. *Lysimachia nummularia*	5	No	FACW
8.			
9.			
10.			
	80	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		165 (B)
Prevalence Index = B/A =			1.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-05 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW, FAC, or OBL.

SOIL

Sampling Point: GS-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/1	90	10YR 5/6	10	C	PL	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as High Water Table (0 in bgs), Saturation (10 in bgs), Hydrogen Sulfide Odor, True Aquatic Plants, Oxidized Rhizospheres on Living Roots. Secondary hydrology indicators present as Geomorphic Position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon | City/County: Franklin | Sampling Date: 6/28/2021

Applicant/Owner: AEP | State: OH | Sampling Point: GS-06

Investigator(s): SM, BR | Section, Township, Range: S 9, T 11N, R 21W

Landform (hillside, terrace, etc.): toeslope | Local relief (concave, convex, none): concave

Slope (%): 4 | Lat: 39.899934 | Long: -82.884976 | Datum: WGS 84

Soil Map Unit Name: So - Sloan silt loam, Columbus Lowland, 0 to 2 percent slopes, freq flooded | NWI classification: PUBGx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-06 for PSS Wetland 6, surrounding manmade pond in residential area. Wetland and pond are located within 100-yr floodplain of Big Walnut Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Populus deltoides*	45	Yes	FAC
2. *Salix exigua*	30	Yes	FACW
3. *Elaeagnus umbellata*	5	No	UPL
4. *Acer saccharinum*	5	No	FACW
5.			
	85 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Solidago gigantea*	35	Yes	FACW
2. *Apocynum cannabinum*	15	Yes	FAC
3. *Ambrosia trifida*	15	Yes	FAC
4. *Trifolium pratense*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	70 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. *Vitis riparia*	10	Yes	FACW
2. *Toxicodendron radicans*	5	Yes	FAC
	15 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	80	x 3 =	240
FACU species	5	x 4 =	20
UPL species	5	x 5 =	25
Column Totals:	170 (A)		445 (B)
Prevalence Index = B/A =			2.62

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-05 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW, FAC, or OBL.

SOIL

Sampling Point: GS-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	10YR 5/8	10	C	PL	Sandy	
4-10	10YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ? Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as Sediment Deposits, Water-Stained Leaves, Oxidized Rhizospheres on Living Roots. Secondary hydrology indicators present as Geomorphic Position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/28/2021

Applicant/Owner: AEP State: OH Sampling Point: Upland 06

Investigator(s): SM, BR Section, Township, Range: S 9, T 11N, R 21W

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): flat

Slope (%): 0 Lat: 39.899821 Long: -82.885104 Datum: WGS 84

Soil Map Unit Name: Ee - Eel silt loam, 0 to 2 percent slopes, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Upland sample point for PSS Wetland 6. Sample point does not meet any wetland criteria. Vegetation recently disturbed from mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*			FAC
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Salix exigua*	5	Yes	FACW
2.			FACW
3.			
4.			
5.			
	5 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Poa pratensis*	70	Yes	FACU
2. *Apocynum cannabinum*	15	No	FACU
3. *Solidago altissima*	15	No	FAC
4.			FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	15	x 3 =	45
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	105 (A)		395 (B)
Prevalence Index = B/A =			3.76

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-06 does not meet hydrophytic vegetation criteria (Dominance Test = 50% and Prevalence Index > 3.0). Dominant species are FAC, FACU or FACW.

SOIL

Sampling Point: Upland 06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/4						Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock fill

Depth (inches): 2

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-7

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes (Wt) NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Depressional PEM wetland, within agricultural field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size:)			
1. *Scirpus atrovirens*	60	Yes	OBL
2. *Xanthium strumarium*	10	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland GS-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 3/1	60	7.5YR 5/6	5	C	M	Loamy/Clayey	
	10YR 4/1	35						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/28/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-7

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes (Wt) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No x	**Is the Sampled Area within a Wetland?** **Yes** **No**
Hydric Soil Present?	Yes	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Upland data point corresponding to Wetland GS-7, adjacent to gravel access road, within agricultural field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size:)			
1. *Ambrosia artemisiifolia*	50	Yes	UPL
2. *Trifolium repens*	25	Yes	FACU
3. *Xanthium strumarium*	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	50	x 5 =	250
Column Totals:	85 (A)		380 (B)

Prevalence Index = B/A = 4.47

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland GS-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/4	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? Yes ___ No ___ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One secondary indicator for wetland hydrology was observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon | City/County: Franklin | Sampling Date: 6/29/2021

Applicant/Owner: AEP | State: OH | Sampling Point: GS-07

Investigator(s): SM, BR | Section, Township, Range: S 26, T 12N, R 21W

Landform (hillside, terrace, etc.): depressional | Local relief (concave, convex, none): concave

Slope (%): 3 | Lat: 39.924614 | Long: 39.924614 | Datum: WGS 84

Soil Map Unit Name: Ko - Kokomo silty clay loam, 0 to 2 percent slopes | NWI classification: PUBGx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-07 for PSS Wetland 8, adjacent to Pond 09 and industrial properties.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	5	Yes	FACW
3. *Morus alba*	5	Yes	FAC
4.			
5.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Populus deltoides*	10	Yes	FAC
2. *Lonicera maackii*	5	Yes	FACW
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	50	Yes	FACW
2. *Lemna minor*	25	Yes	FAC
3.			FAC
4.			FACU
5.			
6.			
7.			
8.			
9.			
10.			
	75	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Vitis riparia*	10	Yes	FACW
2.			
	10	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		290 (B)

Prevalence Index = B/A = 2.42

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-07 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW or FAC.

SOIL

Sampling Point: GS-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					Muck	
3-16	10YR 4/2	60	10YR 5/8	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 12

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as High Water Table, Saturation, True Aquatic Plants and Water-Stained Leaves. Secondary hydrology indicators present as Geomorphic Position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/29/2021

Applicant/Owner: AEP State: OH Sampling Point: Upland 08

Investigator(s): SM, BR Section, Township, Range: S 26, T 12N, R 21W

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): convex

Slope (%): 5 Lat: 39.924617 Long: -82.843237 Datum: WGS 84

Soil Map Unit Name: Ko - Kokomo silty clay loam, 0 to 2 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Sample point Upland 08 for PEM Wetland 08. Sample point does not meet hydric soil or wetland hydrology criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Populus deltoides*	75	Yes	FAC
2. *Morus alba*	5	No	FACW
3.			
4.			
5.			
	80	=Total Cover	
Herb Stratum (Plot size: 5')			
1.			FACW
2.			FAC
3.			FAC
4.			FACU
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Vitis riparia*	10	Yes	FACW
2. *Toxicodendron radicans*	5	Yes	FAC
	15	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	85	x 3 =	255
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		285 (B)
Prevalence Index = B/A =			2.85

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point Upland 08 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are FACW or FAC.

SOIL

Sampling Point: Upland 08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	80	10YR 4/6	20	C	M	Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ? Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: fill material

Depth (inches): 4

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ? Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/29/2021

Applicant/Owner: AEP State: OH Sampling Point: GS-08

Investigator(s): SM, BR Section, Township, Range: S 22, T 12N, R 21W

Landform (hillside, terrace, etc.): depressional Local relief (concave, convex, none): concave

Slope (%): 3 Lat: 39.930700 Long: -82.856596 Datum: WGS 84

Soil Map Unit Name: Pm - Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-08 for PFO Wetland 08, located southwest of I-270 adjacent to hayfield property.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Ulmus rubra*	10	Yes	FAC
4.			
5.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	5	Yes	FACW
2. *Elaeagnus umbellata*	5	Yes	FACU
3. *Lonicera maackii*	3	Yes	UPL
4.			
5.			
	13	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Scirpus cyperinus*	50	Yes	OBL
2. *Carex stricta*	25	Yes	OBL
3. *Scirpus atrovirens*	15	No	OBL
4. *Solidago gigantea*	15	No	FACW
5. *Agrostis gigantea*	10	No	FACW
6. *Erigeron strigosus*	5	No	FACU
7. *Ambrosia trifida*	5	No	FAC
8. *Securigera varia*	3	No	UPL
9.			
10.			
	128	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	40	x 2 =	80
FAC species	25	x 3 =	75
FACU species	10	x 4 =	40
UPL species	6	x 5 =	30
Column Totals:	171 (A)		315 (B)

Prevalence Index = B/A = 1.84

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-07 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are OBL, FACU, FACW or FAC.

SOIL

Sampling Point: GS-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/2	85	10YR 5/8	15	C	PL/M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock fill

Depth (inches): 10

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as Water-Stained Leaves and Oxidized Rhizospheres on Living Roots. Secondary hydrology indicators present as Surface Soil Cracks and Geomorphic Position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon City/County: Franklin Sampling Date: 6/29/2021

Applicant/Owner: AEP State: OH Sampling Point: Upland 9

Investigator(s): SM, BR Section, Township, Range: S 22, T 12N, R 21W

Landform (hillside, terrace, etc.): plains Local relief (concave, convex, none): flat

Slope (%): 3 Lat: 39.930721 Long: -82.856484 Datum: WGS 84

Soil Map Unit Name: Pm - Pewamo silty clay loam, low carbonate till, 0 to 2 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No ____	

Remarks:
Sample point Upland 09 to PFO Wetland 08, located southwest of I-270 on hayfield property. Vegetation has been recently disturbed in hay harvest.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	5	Yes	FACU
2. *Lonicera maackii*	5	Yes	UPL
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Solidago altissima*	40	Yes	FACU
2. *Ambrosia trifida*	25	Yes	FAC
3. *Trifolium pratense*	15	No	FACU
4. *Solidago gigantea*	15	No	FACU
5. *Scirpus cyperinus*	3	No	OBL
6.			
7.			
8.			
9.			
10.			
	98	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	3	x 1 =	3
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	113 (A)		418 (B)
Prevalence Index = B/A =			3.70

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Upland 09 does not meet hydrophytic vegetation criteria (Dominance Test < 50% and Prevalence Index > 3.0). Dominant species are FAC, FACU or UPL.

SOIL

Sampling Point: Upland 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock fill

Depth (inches): 6

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/29/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-10

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Cardington silt loam, 2 to 6 percent slopes (Crd1B1) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
PFO wetland, adjacent to a pond within the 100-year floodplain of Big Walnut Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	35	Yes	FACW
2. *Fraxinus pennsylvanica*	15	Yes	FACW
3. *Acer saccharinum*	15	Yes	FACW
4. *Acer negundo*	10	No	FAC
5.			
	75	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size:)			
1. *Leersia oryzoides*	25	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Vetland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	85	5YR 4/6	15	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/29/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-10

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Cardington silt loam, 2 to 6 percent slopes (Crd1B1) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No x	**Is the Sampled Area within a Wetland?** **Yes** **No** x
Hydric Soil Present?	Yes	No x	
Wetland Hydrology Present?	Yes	No x	

Remarks:
Upland data point corresponding to Wetland GS-10.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	25	Yes	FACU
2. *Acer negundo*	15	Yes	FAC
3. *Populus deltoides*	5	No	FAC
4.			
5.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Lonicera japonica*	45	Yes	FACU
2.			
3.			
4.			
5.			
	45	=Total Cover	
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	90 (A)		340 (B)
Prevalence Index = B/A =			3.78

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Jpland GS-1(

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 5/4	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: fill / gravel

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/29/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-11

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Shoals silt loam, occasionally flooded (Sh) NWI classification: PUBGx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
PFO wetland, adjacent to a pond within the 100-year floodplain of Big Walnut Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Platanus occidentalis*	10	Yes	FACW
4. *Acer negundo*	5	No	FAC
5.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Platanus occidentalis*	7	Yes	FACW
2. *Fraxinus pennsylvanica*	3	Yes	FACW
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size:)			
1. *Glyceria striata*	20	Yes	OBL
2. *Xanthium strumarium*	15	Yes	OBL
3. *Juncus tenuis*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Vetland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 4/1	90	5YR 4/6	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 6/29/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-11

Investigator(s): B. Rolfes, S. Mueller Section, Township, Range:

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave

Slope (%): 2 Lat: Long: Datum: WGS 84

Soil Map Unit Name: Cardington silt loam, 2 to 6 percent slopes (Crd1B1) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No x	**Is the Sampled Area within a Wetland?** **Yes** **No** x
Hydric Soil Present?	Yes	No x	
Wetland Hydrology Present?	Yes	No x	

Remarks:
Upland data point corresponding to Wetland GS-11, adjacent to gravel access road, within agricultural field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	20	Yes	FACU
2. *Acer negundo*	15	Yes	FAC
3.			
4.			
5.			
	35	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Lonicera japonica*	25	Yes	FACU
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3.			
4.			
5.			
	35	=Total Cover	
Herb Stratum (Plot size:)			
1. *Toxicodendron radicans*	25	Yes	FAC
2. *Rosa rubiginosa*	15	Yes	UPL
3. *Parthenocissus quinquefolia*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	40	x 3 =	120
FACU species	55	x 4 =	220
UPL species	15	x 5 =	75
Column Totals:	120 (A)		435 (B)
Prevalence Index = B/A =			3.63

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Jpland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/2	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: fill / gravel

Depth (inches): 12

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? Yes ___ No ___ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One Primairiy and one secondary hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Rd-Shannon | City/County: Franklin | Sampling Date: 6/29/2021

Applicant/Owner: AEP | State: OH | Sampling Point: GS-09

Investigator(s): SM, BR | Section, Township, Range: S 22, T 12N, R 21W

Landform (hillside, terrace, etc.): floodplain | Local relief (concave, convex, none): concave

Slope (%): 2 | Lat: 39.933139 | Long: -82.866288 | Datum: WGS 84

Soil Map Unit Name: Sh - Shoals silt loam, occasionally flooded | NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Sample point GS-09 for PEM Wetland 12, located adjacent to LDB of Big Walnut Creek and within 100-year floodplain/floodway of Big Walnut Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus rubra*	5	Yes	FAC
2. *Acer negundo*	5	Yes	FAC
3. *Ulmus rubra*	3	Yes	FAC
4.			
5.			
	13	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Ulmus rubra*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Scirpus cyperinus*	85	Yes	OBL
2. *Sagittaria latifolia*	15	No	OBL
3. *Ambrosia trifida*	5	No	FAC
4. *Boehmeria cylindrica*	5	No	OBL
5. *Solidago gigantea*	5	No	FACW
6. *Impatiens capensis*	5	No	FACW
7.			
8.			
9.			
10.			
	120	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. *Toxicodendron radicans*	5	Yes	FAC
2.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	105	x 1 =	105
FACW species	10	x 2 =	20
FAC species	28	x 3 =	84
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	143 (A)		209 (B)

Prevalence Index = B/A = 1.46

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Sample point GS-09 meets hydrophytic vegetation criteria (Dominance Test > 50% and Prevalence Index < 3.0). Dominant species are OBL or FAC.

SOIL

Sampling Point: GS-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	85	7.5YR 4/6	15	C	PL/M	Loamy/Clayey	
4-16	10YR 4/1	60	7.5YR 4/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 12

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology indicators present as Saturation and Oxidized Rhizospheres on Living Roots. Secondary hydrology indicators present as Surface Soil Cracks and Geomorphic Position.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road-Shannon City/County: Franklin County, OH Sampling Date: 6/29/2021

Applicant/Owner: AEP State: OH Sampling Point: Upland GS-12

Investigator(s): SM, BR Section, Township, Range: S 22, T 12N, R 21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): none

Slope (%): 1 Lat: 39.933292 Long: -82.866239 Datum: WGS1984

Soil Map Unit Name: Sh - Shoals silt loam, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	10	Yes	FACU
2. *Acer negundo*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: r=15')			
1. *Lonicera japonica*	25	Yes	FACU
2.			
3.			
4.			
5.			
	25	=Total Cover	
Herb Stratum (Plot size: r=5')			
1. *Viola sororia*	15	Yes	FAC
2. *Phragmites australis*	10	Yes	FACW
3. *Boehmeria cylindrica*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	=Total Cover	
Woody Vine Stratum (Plot size: r=30')			
1. *Toxicodendron radicans*	15	Yes	FAC
2.			
	15	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)
Prevalence Index = B/A = ____	

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Jpland GS-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/4	100				M	Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road-Shannon | City/County: Franklin County, OH | Sampling Date: 1/28/2021

Applicant/Owner: AEP | State: OH | Sampling Point: Wetland GS-13

Investigator(s): P. Renner | Section, Township, Range: S20 T12N R21W

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): none

Slope (%): 1 | Lat: 39.932709 | Long: -82.888923 | Datum: WGS1984

Soil Map Unit Name: Bennington silt loam, 0 to 2 percent slopes | NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Carex vulpinoidea*	30	Yes	FACW
2. *Phragmites australis*	20	Yes	FACW
3. *Juncus effusus*	5	No	OBL
4. *Poa pratensis*	10	No	FAC
5. *Symphyotrichum novae-angliae*	25	Yes	FACW
6.			
7.			
8.			
9.			
10.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	75	x 2 =	150
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		185 (B)

Prevalence Index = B/A = 2.06

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Vetland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? Yes ____ No X Depth (inches): ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road-Shannon | City/County: Franklin County, OH | Sampling Date: 1/28/2021

Applicant/Owner: AEP | State: OH | Sampling Point: Upland GS-13

Investigator(s): P. Renner | Section, Township, Range: S20 T12N R21W

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): none

Slope (%): 1 | Lat: 39.933292 | Long: -82.866238 | Datum: WGS1984

Soil Map Unit Name: Bennington silt loam, 0 to 2 percent slopes | NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. *Lonicera japonica*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15 =Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Setaria faberi*	60	Yes	FACU
2. *Phragmites australis*	25	Yes	FACW
3. *Juncus effusus*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	25	x 2 =	50
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	105 (A)		355 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Jpland GS-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 12

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 7/8/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Wetland GS-14

Investigator(s): B. Rolfes, P. Renner Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 1 Lat: 39.891765 Long: -82.855728 Datum: WGS 84

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes (CrB) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
PFO wetland, within the 100-year floodplain of Blacklick Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *acer saccharinum*	25	Yes	FACW
2. *Fraxinus pennsylvanica*	25	Yes	FACW
3.			
4.			
5.			
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *acer negundo*	5	Yes	FAC
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Boehmeria cylindrica*	30	Yes	OBL
2. *toxicodendron radicans*	10	Yes	OBL
3. *Juncus tenuis*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Vetland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/1	90	10YR 4/6	10	C	M	Loamy/Clayey	
8 - 12	10YR 3/1	95	10YR 4/6	5	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Groves Road - Shannon Alternate Route City/County: Franklin County / Columbus Sampling Date: 7/8/2021

Applicant/Owner: AEP Ohio State: OH Sampling Point: Upland GS-14

Investigator(s): B. Rolfes, P. Renner Section, Township, Range:

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave

Slope (%): 2 Lat: 39.891926 Long: -82.855636 Datum: WGS 84

Soil Map Unit Name: Kendallville silt loam, 2 to 6 percent slopes (KeB) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** x
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	Yes ____	No x	

Remarks:
Upland data point corresponding to Wetland GS-14, adjacent to Shannon Road.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	25	Yes	FACU
2. *Acer negundo*	10	Yes	FAC
3.			
4.			
5.			
	35	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *Lonicera japonica*	30	Yes	FACU
2.			
3.			
4.			
5.			
	30	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *solidage canedensis*	20	Yes	FACU
2. *Geum canadense*	10	Yes	UPL
3. *Rubus allegheniensis*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	85	x 4 =	340
UPL species	10	x 5 =	50
Column Totals:	105 (A)		420 (B)
Prevalence Index = B/A =			4.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Jpland GS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	100				M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: fill / gravel

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One secondary hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line City/County: Franklin County Sampling Date: 1/28/2020

Applicant/Owner: AEP State: OH Sampling Point: Wetland SS-1

Investigator(s): P. Renner; M. Thomayer Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 39.891940 Long: -82.844046 Datum: NAD83

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Identified in field as W-PJR-20200128-3.
PSS Wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. *Cornus racemosa*	65	Yes	FAC
2.			
3.			
4.			
5.			
	65 =Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Scirpus cyperinus*	10	Yes	OBL
2. *Apocynum cannabinum*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		220 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland SS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 5/2	98	10YR 6/6	2	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 4
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line City/County: Franklin County Sampling Date: 1/28/2020

Applicant/Owner: AEP State: OH Sampling Point: Upland SS-1

Investigator(s): P. Renner; M. Thomayer Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): None

Slope (%): 1 Lat: 39.891936 Long: -82.844108 Datum: NAD83

Soil Map Unit Name: Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Identified in field as UP-PJR-20200128-5.
Non-wetland data point corresponding to Wetland SS-1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. *Lonicera tatarica*	60	Yes	FACU
2. *Cornus florida*	15	No	FACU
3. *Cornus racemosa*	5	No	FAC
4.			
5.			
	80 =Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Solidago altissima*	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland SS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 5/3	100					Loamy/Clayey	
7-18	10YR 5/6	100					Loamy/Clayey	15% gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line City/County: Franklin County Sampling Date: 2/19/2020

Applicant/Owner: AEP State: OH Sampling Point: Wetland as-2

Investigator(s): P. Renner; M. Thomayer Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 39.906820 Long: -82.843658 Datum: NAD83

Soil Map Unit Name: Eel silt loam, occasionally flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Identified in field as W-PJR-20200219-2.
PEM Wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Eutrochium maculatum*	20	Yes	OBL
2. *Phalaris arundinacea*	75	Yes	FACW
3. *Persicaria pensylvanica*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	80	x 2 =	160
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		180 (B)

Prevalence Index = B/A = 1.80

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland as-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/2	95	10YR 5/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line City/County: Franklin County Sampling Date: 2/19/2020

Applicant/Owner: AEP State: OH Sampling Point: Upland AS-2

Investigator(s): P. Renner; M. Thomayer Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 39.907179 Long: -82.842948 Datum: NAD83

Soil Map Unit Name: Eel silt loam, occasionally flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Identified in field as UP-PJR-20200219-2.
Non-wetland data point corresponding to Wetland AS-2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. *Juglans nigra*	10	Yes	FACU
2. *Maclura pomifera*	5	Yes	FACU
3.			
4.			
5.			
	15 =Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Phytolacca americana*	5	Yes	FACU
2. *Cicuta maculata*	10	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1. *Lonicera japonica*	10	Yes	FACU
2.			
	10 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	40 (A)		130 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland AS-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 5/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line City/County: Franklin County Sampling Date: 2/19/2020

Applicant/Owner: AEP State: OH Sampling Point: Wetland AS-3

Investigator(s): P. Renner; M. Thomayer Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: 39.896263 Long: -82.843822 Datum: NAD83

Soil Map Unit Name: Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Identified in field as W-PJR-20200219-1.
PEM Wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Juncus effusus*	5	No	OBL
2. *Phalaris arundinacea*	85	Yes	FACW
3. *Symphyotrichum novae-angliae*	5	No	FACW
4. *Apocynum cannabinum*	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	105 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	90	x 2 =	180
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		215 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland AS-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					Loamy/Clayey	
3-18	10YR 3/1	95	10YR 5/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Astor Extension 138 kV Transmission Line | City/County: Franklin County | Sampling Date: 2/19/2020

Applicant/Owner: AEP | State: OH | Sampling Point: Upland AS-3

Investigator(s): P. Renner; M. Thomayer | Section, Township, Range: T11N R21W

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave

Slope (%): 1 | Lat: 39.896704 | Long: -82.843716 | Datum: NAD83

Soil Map Unit Name: Westland silty clay loam, Southern Ohio Till Plain, 0 to 2 percent slopes | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Identified in field as UP-PJR-20200219-1.
Non-wetland data point corresponding to Wetland AS-3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: r=5')			
1. *Setaria faberi*	75	Yes	FACU
2. *Phalaris arundinacea*	15	No	FACW
3. *Xanthium spinosum*	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: r=30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland AS-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					Loamy/Clayey	
4-18	10YR 3/1	95	10YR 5/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D.

OEPA ORAM Wetland Data Forms

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-1 (PFO/PEM)

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

6	8
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

7	15
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

5	20
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

20
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	Rater(s): B. Rolfes, S. Mueller	Date: 6/28/2021

20 subtotal first page

Wetland GS-1 (PFO/PEM)

Metric 5. Special Wetlands.

5 max 10 pts. | 25 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [X] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

3 max 20 pts. | 28 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [1] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

28 **Category 1**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-2 (PEM/PSS)

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

4	6
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

18	24
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [X] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [X] road bed/RR track
- [ ] dredging
- [ ] other_____

7	30
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

30
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-2 (PEM/PSS)

30
subtotal first page

0	30
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

6	36
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [2] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [X] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

36 **Modified Category 2**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 03	**Rater(s):** SM, BR	**Date:** 6/28/2021

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

7	9
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [X] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

20	29
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [X] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [X] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [X] road bed/RR track
- [ ] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

11	40
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [X] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

40
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 03	**Rater(s):** SM, BR	**Date:** 6/28/2021

48
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 48 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

3 max 20 pts. | 51 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [0] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

51 Category 2

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 05	**Rater(s):** SM, BR	**Date:** 6/28/2021

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

4	6
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

10	16
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [X] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [X] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

13	29
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [X] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [X] dredging
- [ ] farming
- [ ] nutrient enrichment

29
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 05	**Rater(s):** SM, BR	**Date:** 6/28/2021

29
subtotal first page

0 | 29
max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

6 | 35
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [1] Aquatic bed
- [2] Emergent
- [0] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

35

Modified
Category 2

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 06	**Rater(s):** SM, BR	**Date:** 6/29/2021

Metric 1. Wetland Area (size).

1	1
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [X] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

2	3
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

15	18
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [X] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [X] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

12	30
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [X] dredging
- [ ] farming
- [ ] nutrient enrichment

30
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 06	**Rater(s):** SM, BR	**Date:** 6/28/2021

30
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 30 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

4 max 20 pts. | 34 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [0] Emergent
- [2] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [X] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

34 Category 1or 2 Grey Zone

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-7 (PEM)

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [X] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

2	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [X] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

8	11
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [X] road bed/RR track
- [ ] dredging
- [X] other agriculture

3	14
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [X] dredging
- [X] farming
- [X] nutrient enrichment

14
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	Rater(s): B. Rolfes, S. Mueller	Date: 6/28/2021

14 subtotal first page

Wetland GS-7 (PEM)

Metric 5. Special Wetlands.

0 max 10 pts. | 14 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

2 max 20 pts. | 16 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [X] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

16 **Category 1**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 08	**Rater(s):** SM, BR	**Date:** 6/29/2021

Metric 1. Wetland Area (size).

1	1
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [X] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

4	5
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

16	21
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [X] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [X] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

15	36
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [X] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [X] dredging
- [ ] farming
- [ ] nutrient enrichment

36
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 08	**Rater(s):** SM, BR	**Date:** 6/29/2021

36
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 36 subtotal

Check all that apply and score as indicated.

	Bog (10)
	Fen (10)
	Old growth forest (10)
	Mature forested wetland (5)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
	Lake Erie coastal/tributary wetland-restricted hydrology (5)
	Lake Plain Sand Prairies (Oak Openings) (10)
	Relict Wet Prairies (10)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migratory songbird/water fowl habitat or usage (10)
	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

5 max 20 pts. | 41 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
2	Emergent
1	Shrub
	Forest
	Mudflats
1	Open water
	Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

	High (5)
	Moderately high(4)
	Moderate (3)
	Moderately low (2)
X	Low (1)
	None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

	Extensive >75% cover (-5)
X	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

	Vegetated hummucks/tussucks
	Coarse woody debris >15cm (6in)
	Standing dead >25cm (10in) dbh
3	Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

41 Modified Category 2

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 09	**Rater(s):** SM, BR	**Date:** 6/29/2021

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

2	4
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

13	17
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] ditch
- [X] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

18	35
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [X] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [X] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

35
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 09	**Rater(s):** SM, BR	**Date:** 6/29/2021

35
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 35 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

8 max 20 pts. | 43 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [2] Emergent
- [0] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [X] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

43

Modified Category 2

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-10 (PFO)

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

9	11
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [X] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

16	27
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [X] road bed/RR track
- [ ] dredging
- [ ] other_____

13	40
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [X] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

40
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	Rater(s): B. Rolfes, S. Mueller	Date: 6/28/2021

Wetland GS-10 (PFO)

40
subtotal first page

Metric 5. Special Wetlands.

5 (max 10 pts.) | 45 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [X] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

10 (max 20 pts.) | 55 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [2] Coarse woody debris >15cm (6in)
- [2] Standing dead >25cm (10in) dbh
- [2] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

55 **Category 2**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, S. Mueller	**Date:** 6/28/2021

Wetland GS-11 (PFO)

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

9	11
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [X] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

18	29
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [X] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [X] road bed/RR track
- [ ] dredging
- [ ] other_____

12	41
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [X] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [X] dredging
- [ ] farming
- [ ] nutrient enrichment

41
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	Rater(s): B. Rolfes, S. Mueller	Date: 6/28/2021

Wetland GS-11 (PFO)

41 subtotal first page

0 max 10 pts. | 41 subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

7 max 20 pts. | 48 subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [2] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

48 **Category 2**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland 12	**Rater(s):** SM, BR	**Date:** 6/29/2021

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [x] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

7	9
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

22	31
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [x] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [x] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [x] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other

Metric 4. Habitat Alteration and Development.

18	49
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

49
subtotal this page

last revised 1 February 2001 jjm

Site: Wetland 12	**Rater(s):** SM, BR	**Date:** 6/29/2021

49
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 49 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

7 max 20 pts. | 56 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [3] Emergent
- [0] Shrub
- [ ] Forest
- [1] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [X] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ ] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

56

Category 2

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road-Shannon	**Rater(s):** P. Renner	**Date:** 1/28/2020

Wetland GS-13

Metric 1. Wetland Area (size).

1 max 6 pts. | 1 subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

2 max 14 pts. | 3 subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

5 max 30 pts. | 8 subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

7 max 20 pts. | 15 subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [ ] grazing
- [x] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

15 subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road-Shannon	**Rater(s):** P. Renner	**Date:** 1/28/2020

Wetland GS-13

15
subtotal first page

Metric 5. Special Wetlands.

0 max 10 pts. | 15 subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

-2 max 20 pts. | 13 subtotal

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [✓] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [✓] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

13

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Groves Road - Shannon	**Rater(s):** B. Rolfes, P. Renner	**Date:** 7/8/2021

Wetland GS-14 (PFO)

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

6	8
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

14	22
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

13	35
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [X] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [X] dredging
- [ ] farming
- [ ] nutrient enrichment

35
subtotal this page

last revised 1 February 2001 jjm

Site: Groves Road - Shannon	Rater(s): B. Rolfes, P. Renner	Date: 7/8/2021

Wetland GS-14 (PFO)

35
subtotal first page

0 max 10 pts. | 35 subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

8 max 20 pts. | 43 subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [X] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

43 **Category 2**

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Astor Extension 138 kV Transmission Line	**Rater(s):** M. Thomayer, P. Renner	**Date:** 1/28/2020

Field ID: W-PJR-20200128-3
Report ID: Wetland SS-1

Metric 1. Wetland Area (size).

0 (max 6 pts.) | 0 (subtotal)

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [x] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

1 (max 14 pts.) | 1 (subtotal)

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

5 (max 30 pts.) | 6 (subtotal)

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [x] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

5.5 (max 20 pts.) | 11.5 (subtotal)

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [ ] grazing
- [x] clearcutting
- [ ] selective cutting
- [x] woody debris removal
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

11.5 (subtotal this page)

last revised 1 February 2001 jjm

Site: Astor Extension 138 kV Transmission Line	Rater(s): M. Thomayer, P. Renner	Date: 1/28/2020

Wetland SS-1

11.5
subtotal first page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 11.5 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

1 (max 20 pts.) | 12.5 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [0] Emergent
- [1] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [✓] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

12.5

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Astor Extension 138 kV Transmission Line	**Rater(s):** M. Thomayer, P. Renner	**Date:** 2/19/2020

Field ID: W-PJR-20200219-2
Report ID: Wetland AS-2

Metric 1. Wetland Area (size).

1	1
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

4	5
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

12	17
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [x] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [x] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

7.5	24.5
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [x] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

24.5
subtotal this page

last revised 1 February 2001 jjm

Site: Astor Extension 138 kV Transmission Line	Rater(s): M. Thomayer, P. Renner	Date: 2/19/2020

24.5
subtotal first page

Wetland AS-2

Metric 5. Special Wetlands.

0 (max 10 pts.) | 24.5 (subtotal)

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

Metric 6. Plant communities, interspersion, microtopography.

-2 (max 20 pts.) | 22.5 (subtotal)

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [✓] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [✓] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

22.5

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Astor Extension 138 kV Transmission Line	**Rater(s):** M. Thomayer, P. Renner	**Date:** 2/19/2020

Field ID: W-PJR-20200219-1
Report ID: Wetland AS-3

Metric 1. Wetland Area (size).

2	2
max 6 pts.	subtotal

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [x] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

1	3
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

11	14
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [x] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

7.5	21.5
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [ ] grazing
- [x] clearcutting
- [ ] selective cutting
- [x] woody debris removal
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

21.5
subtotal this page

last revised 1 February 2001 jjm

Site: Astor Extension 138 kV Transmission Line	**Rater(s):** M. Thomayer, P. Renner	**Date:** 2/19/2020

Wetland AS-3

21.5
subtotal first page

0 (max 10 pts.) | 21.5 (subtotal)

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

-1 (max 20 pts.) | 20.5 (subtotal)

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [✓] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [✓] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

20.5

End of Quantitative Rating. Complete Categorization Worksheets.

Appendix E.

OEPA QHEI/HHEI Stream Data Forms

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : **40**

SITE NAME/LOCATION: **Groves Road - Shannon Transmission Line (Alternate Route)**

SITE NUMBER: **GS-02** RIVER BASIN: **Scioto** DRAINAGE AREA (mi^2): **0.41**

LENGTH OF STREAM REACH (ft): **221** LAT.: **39.91020** LONG.: **-81.89130** RIVER CODE: _____ RIVER MILE: _____

DATE: **06/28/21** SCORER: **BR/SM** COMMENTS: **Intermittent Stream**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☑ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]	0%	☐	SILT [3 pt]	90%
☐	BOULDER (>256 mm) [16 pts]	0%	☑	LEAF PACK/WOODY DEBRIS [3 pts]	6%
☐	BEDROCK [16 pt]	0%	☐	FINE DETRITUS [3 pts]	0%
☐	COBBLE (65-256 mm) [12 pts]	2%	☐	CLAY or HARDPAN [0 pt]	0%
☐	GRAVEL (2-64 mm) [9 pts]	2%	☐	MUCK [0 pts]	0%
☐	SAND (<2 mm) [6 pts]	0%	☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: **2.00%** (A) Substrate Percentage Check (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6** **TOTAL NUMBER OF SUBSTRATE TYPES:** **4**

HHEI Metric Points

Substrate Max = 40

10

A + B

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐	> 30 centimeters [20 pts]	☑	> 5 cm - 10 cm [15 pts]
☐	> 22.5 - 30 cm [30 pts]	☐	< 5 cm [5 pts]
☐	> 10 - 22.5 cm [25 pts]	☐	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: _____ **MAXIMUM POOL DEPTH (centimeters):** **8**

Pool Depth Max = 30

15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) **(Check *ONLY* one box):**

☐	> 4.0 meters (> 13') [30 pts]	☑	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☐	≤ 1.0 m (<=3' 3") [5 pts]
☐	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS: _____ **AVERAGE BANKFULL WIDTH (meters):** **1.20**

Bankfull Width Max=30

15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☑	☐	Moderate 5-10m	☑	☑	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☑	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS: Stream originates from man-made pond overflow and is subject to routine flooding.

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☐ Stream Flowing
☑ Subsurface flow with isolated pools (Interstitial)
☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS: _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☐	None	☐	1.0	☐	2.0	☐	3.0
☑	0.5	☐	1.5	☐	2.5	☐	>3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☑ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☑ WWH Name: **Mason Run** Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: **Northeast Columbus** NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: **Franklin** Township / City: **Columbus**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: _____ Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): **N** Canopy (% open): **45%**

Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

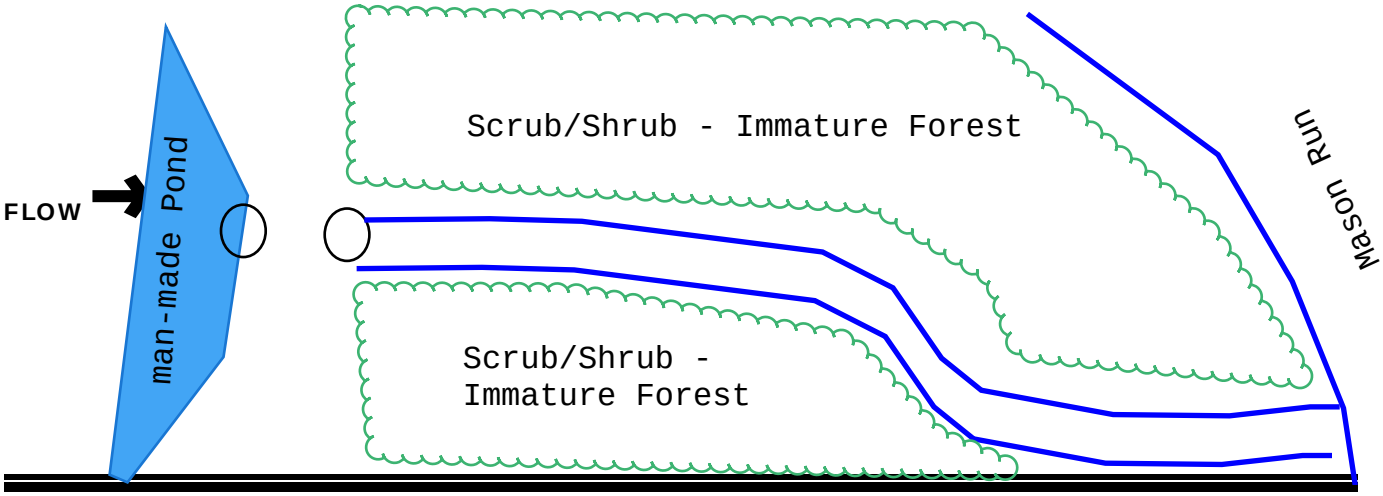
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**

Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Save as pdf Reset Form

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : **40**

SITE NAME/LOCATION: **Groves Road - Shannon Transmission Line (Alternate Route)**

SITE NUMBER: **GS-06** RIVER BASIN: **Scioto** DRAINAGE AREA (mi^2): **0.00**

LENGTH OF STREAM REACH (ft): **22** LAT. LONG. RIVER CODE RIVER MILE

DATE: **07/08/21** SCORER: **BJR/PJR** COMMENTS: **Perennial Stream**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☑ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]	0%	☑	SILT [3 pt]	70%
☐	BOULDER (>256 mm) [16 pts]	0%	☑	LEAF PACK/WOODY DEBRIS [3 pts]	15%
☐	BEDROCK [16 pt]	0%	☐	FINE DETRITUS [3 pts]	0%
☐	COBBLE (65-256 mm) [12 pts]	0%	☐	CLAY or HARDPAN [0 pt]	0%
☐	GRAVEL (2-64 mm) [9 pts]	10%	☐	MUCK [0 pts]	0%
☐	SAND (<2 mm) [6 pts]	5%	☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: **0.00%** **(A)** Substrate Percentage Check **(B)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6** **TOTAL NUMBER OF SUBSTRATE TYPES:** **4**

HHEI Metric Points

Substrate Max = 40

10

A + B

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐	> 30 centimeters [20 pts]	☐	> 5 cm - 10 cm [15 pts]
☐	> 22.5 - 30 cm [30 pts]	☐	< 5 cm [5 pts]
☑	> 10 - 22.5 cm [25 pts]	☐	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS **MAXIMUM POOL DEPTH (centimeters):** **20**

Pool Depth Max = 30

25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) **(Check *ONLY* one box):**

☐	> 4.0 meters (> 13') [30 pts]	☐	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☑	≤ 1.0 m (<=3' 3") [5 pts]
☐	> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		

COMMENTS **AVERAGE BANKFULL WIDTH (meters):** **1.00**

Bankfull Width Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☑	☐	Urban or Industrial
☑	☑	Narrow <5m	☐	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS: **Stream originates from stormwater runoff and is partially channelized.**

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☑ Stream Flowing ☐ Moist Channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☑ None ☐ 1.0 ☐ 2.0 ☐ 3.0

☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

STREAM GRADIENT ESTIMATE

☑ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☑ WWH Name: **Big Walnut Creek** Distance from Evaluated Stream **0.75**

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: **Northeast Columbus** NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: **Franklin** Township / City: **Columbus**

MISCELLANEOUS

Base Flow Conditions? (Y/N): **Y** Date of last precipitation: _____ Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): **N** Canopy (% open): **75%**

Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

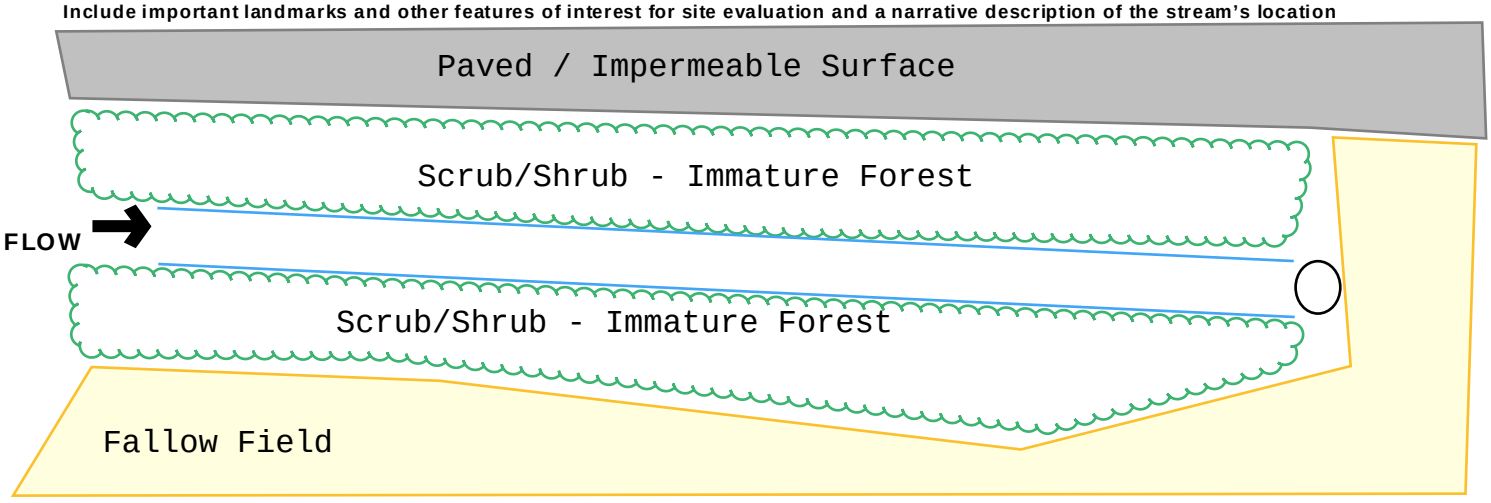
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**

Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Save as pdf Reset Form

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 43

Stream & Location: Stream AS-6, Astor Extension 138 kV Transmission Line **RM:** _ _ _._ **Date:** 2/19/20

Scorers Full Name & Affiliation: P. Renner, WSP USA

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39.91047 /82.83495 **Office verified location** ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	20	10	☐ ☐ MUCK [2]		
☑ ☑ GRAVEL [7]	80	90	☐ ☐ SILT [2]	10	
☐ ☐ SAND [6]			☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 13 *Maximum 20*

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

____ UNDERCUT BANKS [1]	____ POOLS > 70cm [2]	____ OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	____ ROOTWADS [1]	____ AQUATIC MACROPHYTES [1]
____ SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
____ ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☑ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 6

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☐ LOW [2]
- ☑ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☑ FAIR [3]
- ☑ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☑ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☑ MODERATE [2]
- ☐ LOW [1]

Comments

Channel *Maximum 20* 8

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION L	EROSION R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH L	RIPARIAN WIDTH R	
☐	☐	WIDE > 50m [4]
☐	☑	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☑	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☑ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☑ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 3

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 0

6] GRADIENT

(10.77 ft/mi)

DRAINAGE AREA

(3.75 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☑ HIGH - VERY HIGH [10-6]

%POOL: 0.3 %GLIDE: 0.4

%RUN: 0.1 %RIFFLE: 0.2

Gradient *Maximum 10* 8

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☑ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☑ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☑ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

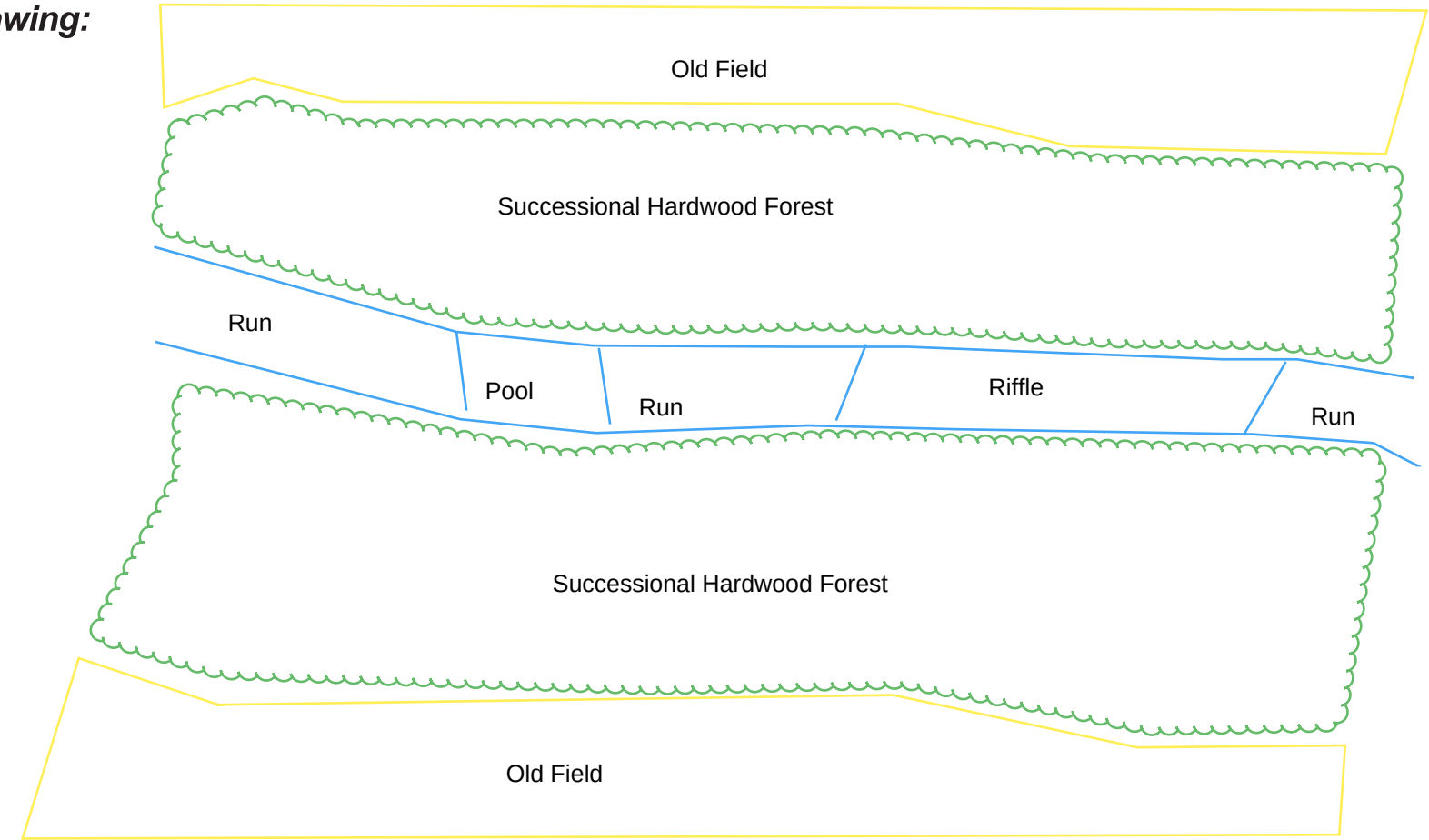
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 47

Stream & Location: Stream AS-8, Astor Extension 138 kV Transmission Line RM: ___.__ Date: 4/21/21

Scorers Full Name & Affiliation: P. Renner, WSP USA

River Code: ___-___-___ STORET #: ______ Lat./Long.: (NAD 83 - decimal °) 39.9160 /82.8350 Office verified location ☐

1] *SUBSTRATE* Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]		2	☐☐ MUCK [2]		
☐☑ GRAVEL [7]	20	58	☐☐ SILT [2]	15	20
☑☐ SAND [6]	65	20	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN: ☐ LIMESTONE [1] ☑ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: SILT: ☐ HEAVY [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1]; EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate 12 *Maximum 20*

Comments

2] *INSTREAM COVER* Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

___ UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
___ SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
___ ROOTMATS [1]		

AMOUNT Check ONE (*Or 2 & average*)

☐ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☑ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20 6

3] *CHANNEL MORPHOLOGY* Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☑ LOW [2]	☑ FAIR [3]	☑ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel Maximum 20 10

4] *BANK EROSION AND RIPARIAN ZONE* Check **ONE** in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

L	R	EROSION
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

L	R	RIPARIAN WIDTH
☐	☐	WIDE > 50m [4]
☐	☑	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☑	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

L	R	FLOOD PLAIN QUALITY
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10 5

5] *POOL / GLIDE AND RIFFLE / RUN QUALITY*

MAXIMUM DEPTH Check **ONE** (*ONLY!*)

☐ > 1m [6] ☐ 0.7-<1m [4] ☑ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)

☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1] ☐ VERY FAST [1] ☐ FAST [1] ☑ MODERATE [1] ☐ SLOW [1] ☐ INTERSTITIAL [-1] ☐ INTERMITTENT [-2] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current Maximum 12 3

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0] ☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8 3

6] *GRADIENT* (10.0 ft/mi) **DRAINAGE AREA** (3.65 mi²)

☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☑ HIGH - VERY HIGH [10-6]

%POOL: 0.3 %GLIDE: 0.5 %RUN: 0.1 %RIFFLE: 0.1

Gradient Maximum 10 8

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?*, Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass- 2nd	
☐ HIGH	☐
☑ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☑ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass-- 2nd	
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☑ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

pass 1st _____ cm

pass 2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

POOL: ☐ >100ft² ☐ >3ft (AREA / DEPTH)

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

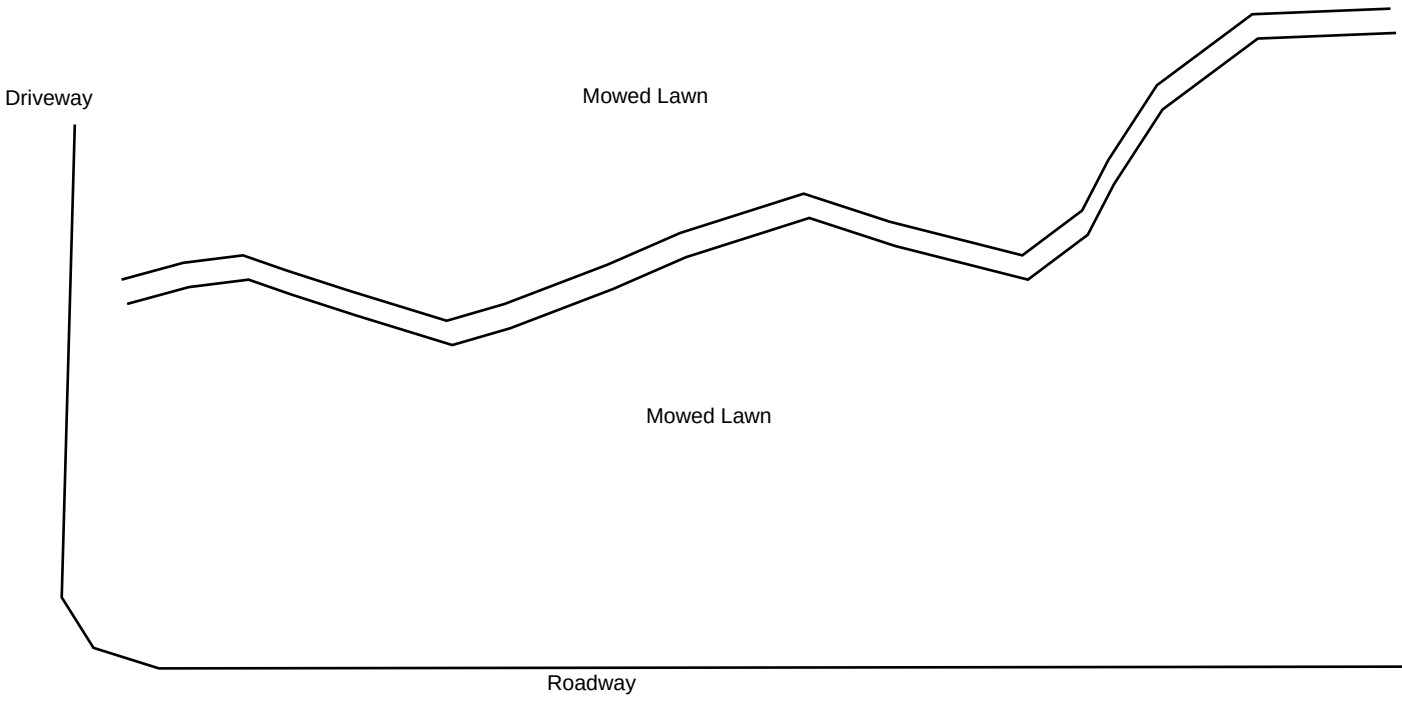
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 35

Stream & Location: Stream GR-1, Groves Road-Refugee 138 kV Trans Line **RM:** _ _ _._ **Date:** 1 / 28 / 20

Scorers Full Name & Affiliation: P. Renner, WSP USA

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39.93019 / 82.88105 **Office verified location** ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	20	10	☐ ☐ MUCK [2]		
☑ ☑ GRAVEL [7]	65	60	☐ ☐ SILT [2]	10	
☐ ☐ SAND [6]			☐ ☐ ARTIFICIAL [0]	5	30
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

SILT / EMBEDDEDNESS

QUALITY
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Substrate 15 *Maximum 20*

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

_ UNDERCUT BANKS [1]	_ POOLS > 70cm [2]	_ OXBOWS, BACKWATERS [1]
_ OVERHANGING VEGETATION [1]	_ ROOTWADS [1]	_ AQUATIC MACROPHYTES [1]
_ SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	_ LOGS OR WOODY DEBRIS [1]
_ ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☑ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 2

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☐ LOW [2]
- ☑ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☐ FAIR [3]
- ☑ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☑ HIGH [3]
- ☐ MODERATE [2]
- ☐ LOW [1]

Comments

Channel *Maximum 20* 6

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☑	☑	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☑	☑	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 2

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☑ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☑ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 2

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 0

6] GRADIENT

(10 ft/mi)

DRAINAGE AREA

(1.62 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☑ HIGH - VERY HIGH [10-6]

%POOL: 30 **%GLIDE:** 40 **%RUN:** 10 **%RIFFLE:** 20

Gradient *Maximum 10* 8

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☑ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☑ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☑ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?*, Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

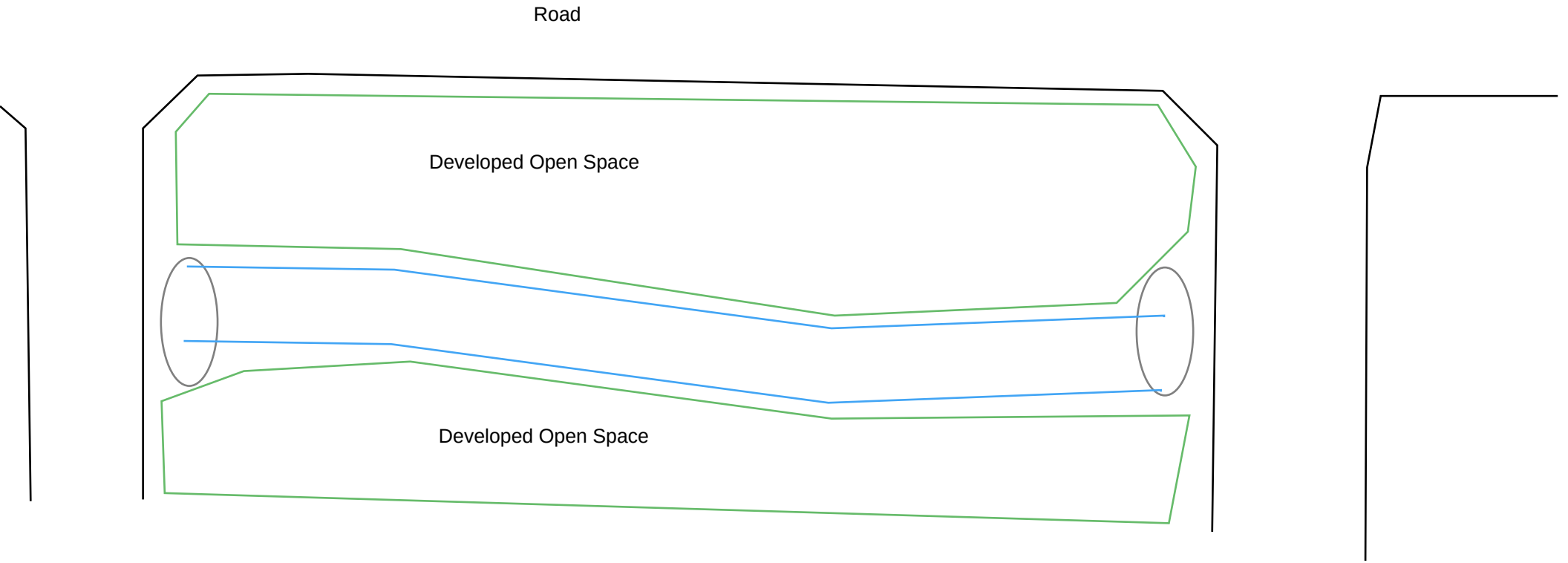
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Appendix F.

Representative Photographs

GROVES – SHANNON 138 KV TRANSMISSION LINE PROJECT
(PREFERRED AND ALTERNATE ROUTES) WETLAND DELINEATION

PHOTOGRAPH 1



Wetland GS-01 (PFO), facing north on June 28, 2021.

PHOTOGRAPH 2



Wetland GS-01 (PFO), facing south on June 28, 2021.

PHOTOGRAPH 3



Wetland GS-01 (PEM), facing north on June 28, 2021.

PHOTOGRAPH 4



Wetland GS-01 (PEM), facing south on June 28, 2021.

PHOTOGRAPH 5



Wetland GS-02 (PEM), facing north on June 28, 2021.

PHOTOGRAPH 6



Wetland GS-02 (PEM), facing south on June 28, 2021.

PHOTOGRAPH 7



Wetland GS-02 (PSS), facing north on June 28, 2021.

PHOTOGRAPH 8



Wetland GS-02 (PSS), facing south on June 28, 2021.

PHOTOGRAPH 9



Wetland GS-03 (PFO), facing north on June 28, 2021.

PHOTOGRAPH 10



Wetland GS-03 (PFO), facing south on June 28, 2021.

PHOTOGRAPH 11



Wetland GS-03 (PEM), facing north on June 28, 2021.

PHOTOGRAPH 12



Wetland GS-03 (PEM), facing south on June 28, 2021.

PHOTOGRAPH 13



Wetland GS-05 (PEM), facing north on June 28, 2021.

PHOTOGRAPH 14



Wetland GS-05 (PEM), facing south on June 28, 2021.

PHOTOGRAPH 15



Wetland GS-05 (PUB), facing south on June 28, 2021.

PHOTOGRAPH 16



Wetland GS-06 (PSS), facing north on June 28, 2021.

PHOTOGRAPH 17



Wetland GS-06 (PSS), facing south on June 28, 2021.

PHOTOGRAPH 18



Wetland GS-07 (PEM), facing north on June 28, 2021.

PHOTOGRAPH 19



Wetland GS-07 (PEM), facing east on June 28, 2021.

PHOTOGRAPH 20



Wetland GS-08 (PEM), facing northwest on June 29, 2021.

PHOTOGRAPH 21



Wetland GS-08 (PEM), facing southeast on June 29, 2021.

PHOTOGRAPH 22



Wetland GS-09 (PEM), facing north on June 29, 2021.

PHOTOGRAPH 23



Wetland GS-09 (PEM), facing south on June 29, 2021.

PHOTOGRAPH 24



Wetland GS-10 (PFO), facing north on June 29, 2021.

PHOTOGRAPH 25



Wetland GS-10 (PFO), facing south on June 29, 2021.

PHOTOGRAPH 26



Wetland GS-11 (PFO), facing east on June 29, 2021.

PHOTOGRAPH 27



Wetland GS-11 (PFO), facing west on June 29, 2021.

PHOTOGRAPH 28



Wetland GS-12 (PEM), facing west on June 29, 2021.

PHOTOGRAPH 29



Wetland GS-12 (PEM), facing east on June 29, 2021.

PHOTOGRAPH 30



Wetland GS-13 (PEM), facing west on July 8, 2021.

PHOTOGRAPH 31



Wetland GS-13 (PEM), facing south on July 8, 2021.

PHOTOGRAPH 32



Wetland GS-14 (PFO), facing north on July 8, 2021.

PHOTOGRAPH 33



Wetland GS-14 (PFO), facing south on July 8, 2021.

PHOTOGRAPH 34



Wetland SS-01 (PSS), facing north on January 28, 2020.

PHOTOGRAPH 35



Wetland SS-01 (PSS), facing south on January 28, 2020.

PHOTOGRAPH 36



Wetland AS-02 (PEM), facing north on February 19, 2020.

PHOTOGRAPH 37



Wetland AS-02 (PEM), facing north on February 19, 2020.

PHOTOGRAPH 38



Wetland AS-03 (PEM), facing north on January 28, 2020.

PHOTOGRAPH 39



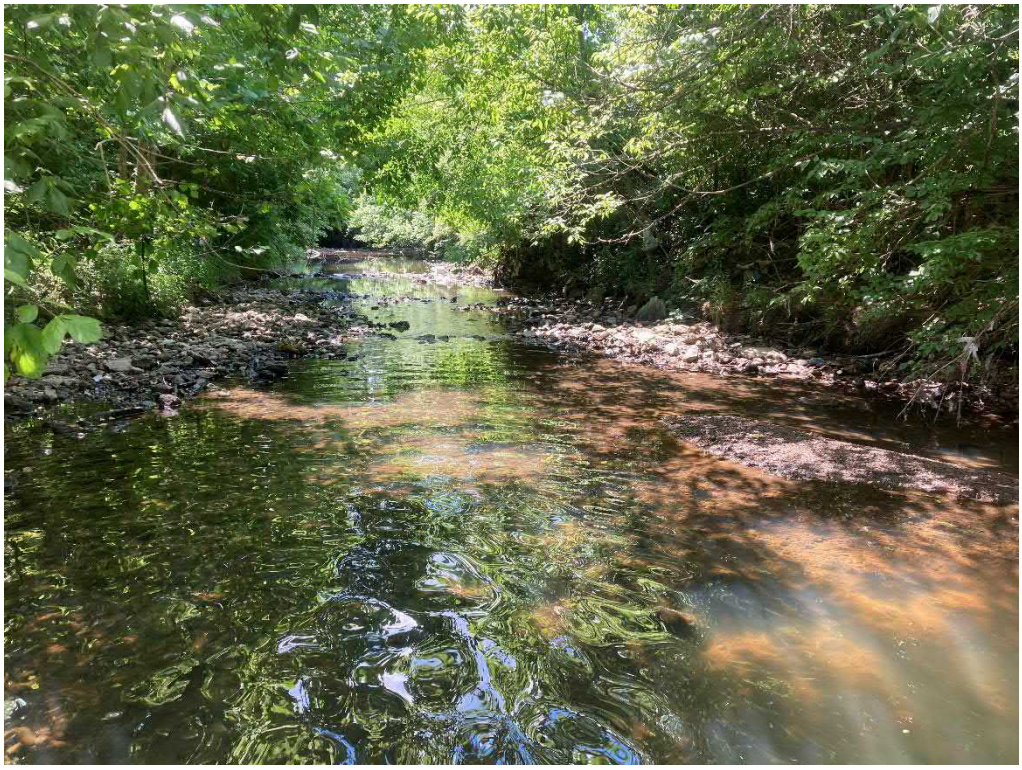
Wetland AS-03 (PEM), facing south on January 28, 2020.

PHOTOGRAPH 40



Stream GS-01 (Mason Run) – Perennial, facing upstream on June 28, 2020.

PHOTOGRAPH 41



Stream GS-01 (Mason Run) – Perennial, facing downstream on June 28, 2021.

PHOTOGRAPH 42



Stream GS-01 (Mason Run) – substrate on June 28, 2021.

PHOTOGRAPH 43



Stream GS-02 (UNT to Mason Run) – Intermittent, facing upstream on June 28, 2021.

PHOTOGRAPH 44



Stream GS-02 (UNT to Mason Run) – Intermittent, facing downstream on June 28, 2021.

PHOTOGRAPH 45



Stream GS-02 (UNT to Mason Run) – Intermittent, substrate on June 28, 2021

PHOTOGRAPH 46



Stream GS-03 (Big Walnut Creek) – Perennial, facing upstream on June 28, 2021.

PHOTOGRAPH 47



Stream GS-03 (Big Walnut Creek) – Perennial, facing downstream on June 28, 2021.

PHOTOGRAPH 48



Stream GS-03 (Big Walnut Creek) – Perennial, substrate on June 28, 2021.

PHOTOGRAPH 4



Stream GS-04 (Blacklick Creek) – Perennial, facing upstream on June 28, 2021.

PHOTOGRAPH 50



Stream GS-04 (Blacklick Creek) – Perennial, facing downstream on June 28, 2021.

PHOTOGRAPH 51



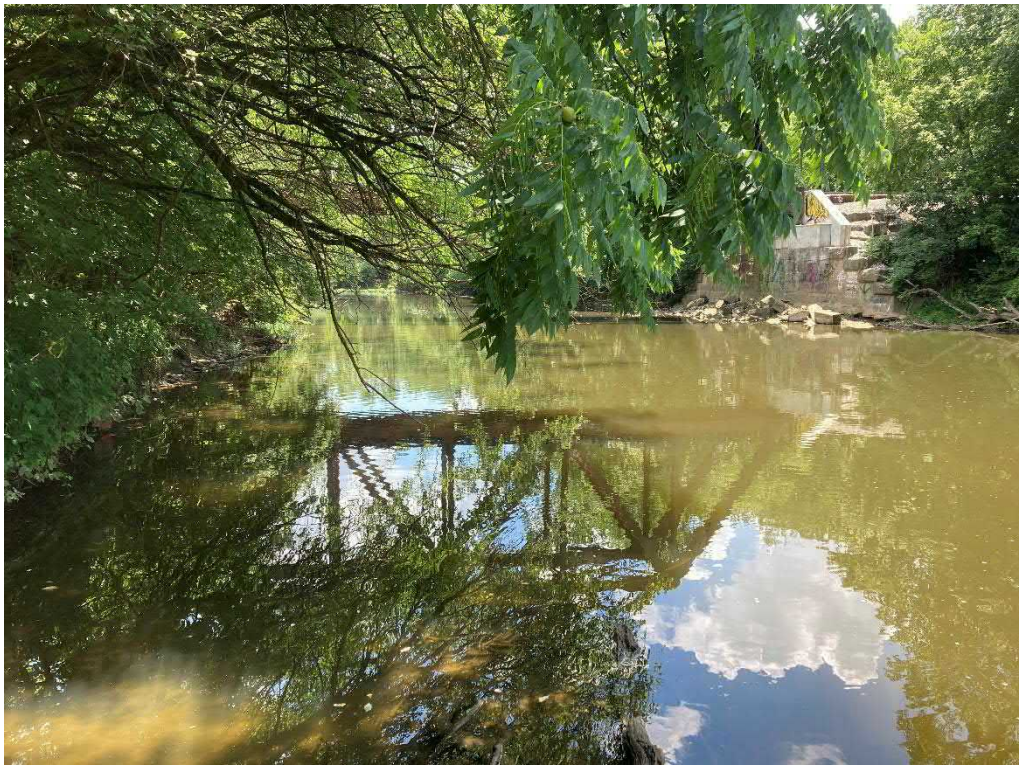
Stream GS-04 (Blacklick Creek) – Perennial, substrate on June 28, 2021.

PHOTOGRAPH 52



Stream GS-05 (Big Walnut Creek) – Perennial, facing upstream on June 29, 2021.

PHOTOGRAPH 53



Stream GS-05 (Big Walnut Creek) – Perennial, facing downstream on June 29, 2021.

PHOTOGRAPH 54



Stream GS-05 (Big Walnut Creek) – Perennial, facing downstream on June 29, 2021.

PHOTOGRAPH 55



Stream GS-06 (UNT to Big Walnut Creek) – Perennial, facing upstream on July 8, 2021.

PHOTOGRAPH 56



Stream GS-06 (UNT to Big Walnut Creek) – Perennial, facing downstream on July 8, 2021.

PHOTOGRAPH 57



Stream GS-06 (UNT to Big Walnut Creek) – Perennial, substrate on July 8, 2021.

PHOTOGRAPH 58



Stream AS-06 (UNT to Blacklick Creek) – Perennial, facing upstream on February 19, 2020.

PHOTOGRAPH 59



Stream AS-06 (UNT to Blacklick Creek) – Perennial, facing downstream on February 19, 2020.

PHOTOGRAPH 60



Stream AS-06 (UNT to Blacklick Creek) – Perennial, substrate on February 19, 2020.

PHOTOGRAPH 61



Stream AS-07 (Blacklick Creek) – Perennial, facing upstream on February 19, 2020.

PHOTOGRAPH 62



Stream AS-07 (Blacklick Creek) – Perennial, facing downstream on February 19, 2020.

PHOTOGRAPH 63



Stream AS-07 (Blacklick Creek) – Perennial, substrate on February 19, 2020.

PHOTOGRAPH 64



Stream AS-08 (UNT to Blacklick Creek) – Perennial, facing upstream on April 20, 2021.

PHOTOGRAPH 65



Stream AS-08 (UNT to Blacklick Creek) – Perennial, facing downstream on April 20, 2021.

PHOTOGRAPH 66



Stream AS-08 (UNT to Blacklick Creek) – Perennial, substrate on April 20, 2021.

PHOTOGRAPH 67



Pond GS-01, facing north on June 28, 2021.

PHOTOGRAPH 68



Pond GS-02, facing west on June 28, 2021.

PHOTOGRAPH 69



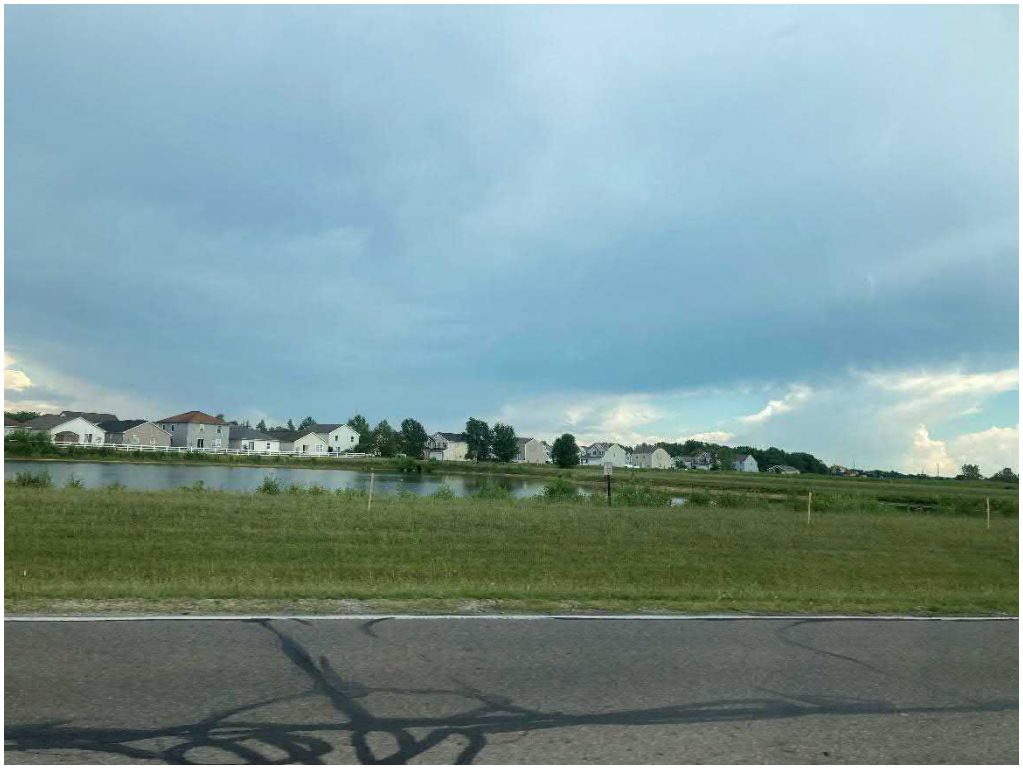
Pond GS-03, facing west on June 28, 2021.

PHOTOGRAPH 70



Pond GS-04, facing southwest on June 28, 2021.

PHOTOGRAPH 71



Pond GS-05, facing south on June 28, 2021.

PHOTOGRAPH 72



Pond GS-06, facing southeast on June 28, 2021.

PHOTOGRAPH 73



Pond GS-07, facing west on June 28, 2021.

PHOTOGRAPH 74



Pond GS-08, facing east on June 28, 2021.

PHOTOGRAPH 75



Pond GS-09, facing west on June 29, 2021.

PHOTOGRAPH 76



Pond GS-09, facing west on June 29, 2021.

PHOTOGRAPH 77



Pond GS-11, facing east on July 8, 2021.

PHOTOGRAPH 78



Pond GS-12, facing south on July 8, 2021.

PHOTOGRAPH 79



Upland GS-01, facing south on July 8, 2021.

PHOTOGRAPH 80



Upland GS-02, facing west on June 28, 2021.

PHOTOGRAPH 81



Upland GS-03, facing north on July 8, 2021.

PHOTOGRAPH 82



Upland GS-05, facing north on June 28, 2021.

PHOTOGRAPH 83



Upland GS-06, facing northeast on July 8, 2021.

PHOTOGRAPH 84



Upland GS-07, facing south on June 28, 2021.

PHOTOGRAPH 85



Upland GS-08, facing northeast on June 29, 2021.

PHOTOGRAPH 86



Upland GS-09, facing northwest on June 29, 2021.

PHOTOGRAPH 87



Upland GS-10, facing north on June 29, 2021.

PHOTOGRAPH 88



Upland GS-11, facing east on June 29, 2021.

PHOTOGRAPH 89



Upland GS-12, facing west on June 29, 2021.

PHOTOGRAPH 90



Upland GS-13, facing north on July 8, 2021.

PHOTOGRAPH 91



Upland GS-14, facing north on July 8, 2021.

PHOTOGRAPH 92



Upland SS-01, facing north on January 28, 2020.

PHOTOGRAPH 93



Upland AS-2, facing north on February 19, 2021.

PHOTOGRAPH 94



Upland AS-03, facing north on February 19, 2020.

Appendix G.

Threatened and Endangered Species Coordination

Ohio Department of Natural Resources
MIKE DEWINE, GOVERNOR MARY MERTZ, DIRECTOR

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

September 13, 2021

Bradley Rolfes
WSP USA
Suite 2500
312 Vine Street
Cincinnati, OH 45202

Re: 21-0780; Groves Road – Shannon 138 kV Transmission Line Rebuild Project Preferred Route

Project: The proposed project involves the extension of the existing transmission line exiting Groves Road Station east and south to existing transmission lines in the vicinity and ultimately to the Shannon Station.

Location: The proposed project is located in Madison Township, Franklin County, Ohio.

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

Natural Heritage Database: The Natural Heritage Database has the following data at or within a one mile radius of the project area:

Tippecanoe darter (*Etheostoma tippecanoe*), T
Pickerington Ponds Metro Park – Columbus & Franklin Co. Metro Parks
Blacklick Greenway Trail – Columbus & Franklin Co. Metro Parks

The review was performed on the project area specified in the 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. Additional comments on some of the features may be found in pertinent sections below.

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.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; U = state status under review; X = presumed extirpated in Ohio; FE = federal endangered, and FT = federal threatened.

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 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 Erin Hazelton at Erin.hazelton@dnr.ohio.gov).

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 is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the project area. Direction on how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that a potential hibernaculum is present within 0.25 miles of the project area, please send this information to Erin Hazelton 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 the 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 following listed mussel species.

Federally Endangered
purple cat's paw (*Epioblasma o. obliquata*)
clubshell (*Pleurobema clava*)
northern riffleshell (*Epioblasma torulosa rangiana*)
rayed bean (*Villosa fabalis*)
snuffbox (*Epioblasma triquetra*)

Federally Threatened
rabbitsfoot (*Quadrula cylindrica cylindrica*)

State Endangered
elephant-ear (*Elliptio crassidens crassidens*)
Long solid (*Fusconaia maculata maculate*)
Ohio pigtoe (*Pleurobema cordatum*)
pocketbook (*Lampsilis ovata*)
washboard (*Megalonaias nervosa*)

State Threatened
black sandshell (*Ligumia recta*)
fawnsfoot (*Truncilla donaciformis*)
pondhorn (*Uniomerus tetralasmus*)
threehorn wartyback (*Obliquaria reflexa*)

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:
https://ohiodnr.gov/static/documents/wildlife/permits/dow-protocol-ohio-mussel-survey.pdf

The project is within the range of the following listed fish species.

Federally Endangered
Scioto madtom (*Noturus trautmani*)

State Endangered
goldeye (*Hiodon alosoides*)
Iowa darter (*Etheostoma exile*)
popeye shiner (*Notropis ariommus*)
northern brook lamprey (*Ichthyomyzon fossor*)
spotted darter (*Etheostoma maculatum*)
shortnose gar (*Lepisosteus platostomus*)
tonguetied minnow (*Exoglossum laurae*)

State Threatened
lake chubsucker (*Erimyzon sucetta*)
paddlefish (*Polyodon spathula*)
Tippecanoe darter (*Etheostoma tippecanoe*)

The DOW recommends no in-water work in perennial streams from March 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 American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their

foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the cattle egret (*Bubulcus ibis*), a state endangered bird. Cattle egrets are not strictly wetland birds. They often forage in dry pastures and fields. Egrets nest in colonies and will build a nest out of sticks and other materials wherever it can be supported. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 through August 15. If no wetland habitat will be impacted, the project is not likely to impact this 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 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

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

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through august 31. If this habitat will not be impacted, this project is not likely to have an impact on 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 through 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 US Fish & Wildlife Service.

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 Mike Pettegrew at mike.pettegrew@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

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

September 13, 2021

Bradley Rolfes
WSP USA
Suite 2500
312 Vine Street
Cincinnati, OH 45202

Re: 21-0781; Groves Road – Shannon 138 kV Transmission Line Rebuild Project Alternate Route

Project: The proposed project involves the extension of the line from the Groves Road Station south and east to Shannon Station.

Location: The proposed project is located in Madison Township, Franklin County, Ohio.

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

Natural Heritage Database: The Natural Heritage Database has the following data at or within a one mile radius of the project area:

Elktoe (*Alasmidonta marginata*), SC
Wavy-rayed lampmussel (*Lampsilis fasciola*), SC
Tippecanoe darter (*Etheostoma tippecanoe*), T
Three Creeks Metro Park – Columbus & Franklin Co. Metro Parks
Blacklick Creek Greenway Trail – Columbus & Franklin Co. Metro Parks
Big Walnut Greenway – Columbus & Franklin Co. Metro Parks

The review was performed on the project area specified in the 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. Additional comments on some of the features may be found in pertinent sections below.

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.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; U = state status under review; X = presumed extirpated in Ohio; FE = federal endangered, and FT = federal threatened.

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 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 Erin Hazelton at Erin.hazelton@dnr.ohio.gov).

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 ≥ 20 if possible.

The DOW also recommends that a desktop habitat assessment is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the project area. Direction on how to conduct habitat assessments can be found in the current USFWS "*Range-wide Indiana Bat Survey Guidelines*." If a habitat assessment finds that a potential hibernaculum is present within 0.25 miles of the project area, please send this information to Erin Hazelton 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 the 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 following listed mussel species.

Federally Endangered	Federally Threatened
purple cat's paw (*Epioblasma o. obliquata*)	rabbitsfoot (*Quadrula cylindrica cylindrica*)
clubshell (*Pleurobema clava*)	
northern riffleshell (*Epioblasma torulosa rangiana*)	
rayed bean (*Villosa fabalis*)	
snuffbox (*Epioblasma triquetra*)	

State Endangered
elephant-ear (*Elliptio crassidens crassidens*)
Long solid (*Fusconaia maculata maculate*)
Ohio pigtoe (*Pleurobema cordatum*)
pocketbook (*Lampsilis ovata*)
washboard (*Megalonaias nervosa*)

State Threatened
black sandshell (*Ligumia recta*)
fawnsfoot (*Truncilla donaciformis*)
pondhorn (*Uniomerus tetralasmus*)
threehorn wartyback (*Obliquaria reflexa*)

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:
https://ohiodnr.gov/static/documents/wildlife/permits/dow-protocol-ohio-mussel-survey.pdf

The project is within the range of the following listed fish species.
Federally Endangered
Scioto madtom (*Noturus trautmani*)

State Endangered
goldeye (*Hiodon alosoides*)
Iowa darter (*Etheostoma exile*)
popeye shiner (*Notropis ariommus*)
northern brook lamprey (*Ichthyomyzon fossor*)
spotted darter (*Etheostoma maculatum*)
shortnose gar (*Lepisosteus platostomus*)
tonguetied minnow (*Exoglossum laurae*)

State Threatened
lake chubsucker (*Erimyzon sucetta*)
paddlefish (*Polyodon spathula*)
Tippecanoe darter (*Etheostoma tippecanoe*)

The DOW recommends no in-water work in perennial streams from March 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 American bittern (*Botaurus lentiginosus*), a state endangered bird. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the black-crowned night-heron *(Nycticorax nycticorax*), a state-threatened bird. Night-herons are so named because they are nocturnal, conducting most of their foraging in the evening hours or at night, and roost in trees near wetlands and waterbodies during

the day. Night herons are migratory and are typically found in Ohio from April 1 through December 1 but can be found in more urbanized areas with reliable food sources year-round. Black-crowned night-herons primarily forage in wetlands and other shallow aquatic habitats, and roost in trees nearby. These night-herons nest in small trees, saplings, shrubs, or sometimes on the ground, near bodies of water and wetlands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 through July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the cattle egret (*Bubulcus ibis*), a state endangered bird. Cattle egrets are not strictly wetland birds. They often forage in dry pastures and fields. Egrets nest in colonies and will build a nest out of sticks and other materials wherever it can be supported. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 through August 15. If no wetland habitat will be impacted, the project is not likely to impact this 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 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

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

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 through July 31. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 through august 31. If this habitat will not be impacted, this project is not likely to have an impact on 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 through 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 US Fish & Wildlife Service.

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 Mike Pettegrew at mike.pettegrew@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

Rolfes, Brad

From: Ohio, FW3 <ohio@fws.gov>
Sent: Friday, August 27, 2021 10:11 AM
To: Rolfes, Brad
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate; Thomayer, Matthew; Grant S Stuller
Subject: AEP - Groves Road – Shannon Transmission Line Preferred Route, Franklin County, Ohio

TAILS# 03E15000-2021-TA-2141

Dear Mr. Rolfes,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

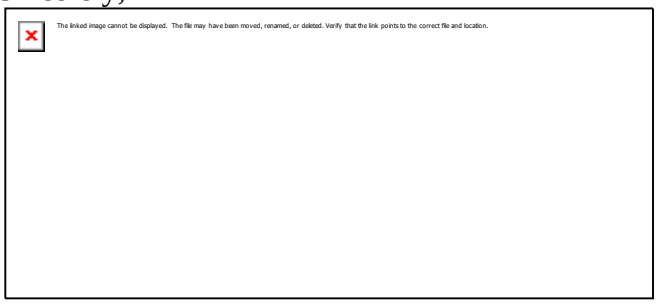
Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

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

Sincerely,



Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW

Rolfes, Brad

From: Ohio, FW3 <ohio@fws.gov>
Sent: Friday, August 27, 2021 10:07 AM
To: Rolfes, Brad
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate; Thomayer, Matthew; Grant S Stuller
Subject: AEP - Groves Road – Shannon Transmission Line Rebuild Alternate Route, Franklin County, Ohio

TAILS# 03E15000-2021-TA-2140

Dear Mr. Rolfes,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees ≥3 inches dbh cannot be avoided, we recommend removal of any trees ≥3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see http://www.fws.gov/midwest/endangered/mammals/nleb/index.html), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.
If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and

conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

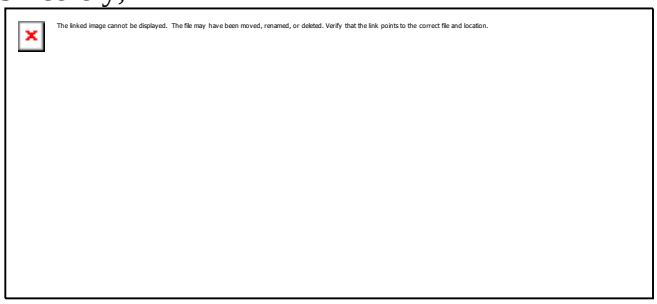
Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus is it important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

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

Sincerely,



Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW