AMERICAN TRANSMISSION SYSTEMS, INCORPORATED
A FIRSTENERGY COMPANY

LETTER OF NOTIFICATION

138 kV TRANSMISSION LINE LOOPS TO YAGER SUBSTATION PROJECT

OPSB CASE NO.: 16-0257-EL-BLN

February 12, 2016

American Transmission Systems, Incorporated
76 South Main Street
Akron, Ohio 44308

LETTER OF NOTIFICATION
138 kV TRANSMISSION LINE LOOPS
TO YAGER SUBSTATION PROJECT

The following information is being provided in accordance with the procedures in the Ohio Administrative Code (OAC) Chapter 4906-6 for Accelerated Certificate Applications. Based upon the requirements found in Appendix A to OAC Rule 4906-1-01, this Project qualifies for submittal to the Ohio Power Siting Board ("Board") as a Letter of Notification application.

4906-6-05: LETTER OF NOTIFICATION REQUIREMENTS

4906-6-05: Name and Reference Number

Name of Project:	138 kV Transmission Line Loop to Yager Substation Project ("Project").
2015 LTFR Reference:	This Project is not included in the FirstEnergy Corp. 2015 Long Term Forecast Report submitted to the Public Utility Commission of Ohio ("PUCO") in Case Number 15-0649-EL-FOR.

4906-6-05 (B)(1): Brief Description of the Project

In this Project, American Transmission Systems, Incorporated ("ATSI"), a FirstEnergy company, is proposing to loop the existing Harmon-Holloway No. 1 & Cloverdale-Holloway No. 2 138 kV Transmission Lines into AEP Ohio Transmission Company, Inc.'s ("AEP") Yager Substation. AEP submitted a separate filing to the Ohio Power Siting Board for the Yager Transmission Station Project, Case No. 15-1666-EL-BLN on October 6, 2015 and the application was approved on November 4, 2015.

As part of the proposed Project, the existing Harmon-Holloway No. 1, and Cloverdale-Holloway 138 kV Transmission Lines will be looped into the AEP's proposed Yager Substation. Additionally, ATSI submitted a separate Letter of Notification to the Board on December 2, 2015, Case Number 15-1761-EL-BLN that includes proposing to loop the existing Harmon-Holloway No. 1 and Cloverdale-Holloway 138 kV Transmission Lines into AEP's proposed Nottingham Switching Station. When both of these projects are installed, the transmission line loops proposed in the Project will create the Harmon-

Yager 138 kV Transmission Line, the Cloverdale-Yager 138 kV Transmission Line, the Nottingham-Yager No. 1 138 kV Transmission Line, and the Nottingham-Yager No. 2 138 kV Transmission Line.

The north extension of the Harmon-Holloway No. 1 Transmission Line loop will extend approximately 200 feet (0.04 miles) starting northwest of existing structure 3381 and heading eastward for approximately 1010 feet (0.19 miles) into the north side of AEP's proposed Yager Substation. The south extension of the Harmon-Holloway No. 1 Transmission Line loop will extend approximately 450 feet (0.09 miles) starting southeast of existing structure 3381 and heading eastward for approximately 670 feet (0.13 miles) into the south side of the AEP's proposed Yager Substation. The total length of the loop line will be 1670 feet (0.32 miles). Along the existing Harmon-Holloway No. 1 Transmission Line, existing structure 3381 will be removed along with approximately 650 feet (0.12 miles) of existing 477 kcmil 24/7 ACSR conductor. The north extension from the existing Harmon-Holloway No. 1 Transmission Line will be constructed with approximately three (3) structures consisting of two (2) 138 kV Single Circuit Wood Pole, Deadend with Guying structures (Exhibit 4) and one (1) 138 kV Single Circuit Wood Pole, Tangent structure (Exhibit 6). The south extension from the existing Harmon-Holloway No. 1 Transmission Line will be constructed with approximately three (3) structures consisting of one (1) 138 kV Single Circuit Wood Pole, Deadend with Guying structures (Exhibit 4), one (1) 138 kV Single Circuit Wood Pole, Tangent structure (Exhibit 6), and one (1) 138 kV Double Circuit Steel Pole, Deadend structure (Exhibit 7).

The north extension of the Cloverdale-Holloway Transmission Line loop will extend approximately 250 feet (0.05 miles) starting southeast of existing structure 6222 and heading eastward for approximately 675 feet (0.13 miles) into the south side of the AEP's proposed Yager Substation. The south extension of the Cloverdale-Holloway Transmission Line loop will also extend approximately 320 feet (0.06 miles) starting southeast of existing structure 6222 and heading eastward for approximately 730 feet (0.14 miles) into the south side of the AEP's proposed Yager Substation. The total length

of the loop line will be 1270 feet (0.24 miles).Approximately 70 feet (0.01 miles) of existing 795 kcmil 26/7 ACSR conductor will be removed between proposed loop lines. The northern extension from the existing Cloverdale-Holloway Transmission Line will be constructed with approximately three (3) structures consisting of two (2) 138 kV Single Circuit Steel Pole, Deadend structures (Exhibit 5) and one (1) 138 kV Single Circuit Wood Pole, Tangent structure (Exhibit 6). The southern extension from the existing Cloverdale-Holloway Transmission Line will be constructed with approximately three (3) structures consisting of one (1) 138 kV Single Circuit Steel Pole, Deadend structures (Exhibit 5), one (1) 138 kV Single Circuit Wood Pole, Tangent structure (Exhibit 6), and one (1) 138 kV Double Circuit Steel Pole, Deadend structure (Exhibit 7).

The general location of the Project is shown in Exhibit 1, a partial copy of the United States Geologic Survey, Carroll County OH, Harrison County OH, Quad Map, ID number 40081-D2. Exhibit 2 is a partial copy of aerial imagery, Digital Orthophoto Quarter Quads ("DOQQ") The Project is located at 90097 Yeager Rd. Dennison, OH 44621. The general layout is shown in Exhibit 3. The Project will be located in Monroe Township, Harrison County, Ohio.

4906-6-05 (B)(1): Letter of Notification Requirement

The Project meets the requirements for a Letter of Notification because the Project is within the types of projects defined by Items (1)(b) and (1)(d)(ii) of the Application Requirement Matrix for Electric Power Transmission Lines, Appendix A of OAC Rule 4906-1-01. These items state:

> *(1) New construction, extension, or relocation of single or multiple circuit electric power transmission line(s), or upgrading existing transmission or distribution line(s) for operating at a higher transmission voltage, as follows:*
>
> > *(b) Line(s) greater than 0.2 miles in length but not greater than two miles in length.*

(d) Lines(s) primarily needed to attract or meet the requirements of a specific customer or customers as follows:

(ii) Any portion of the line is on property owned by someone other than the specific customer or applicant.

The proposed Project is within the requirements of Item (1)(b) as the total extension of the existing 138 kV transmission lines as loops into AEP's proposed Yager Substation is approximately 0.58 miles. This includes the single circuit on the north side of the substation and the multiple circuits on the south side of the substation.

The proposed Project is within the requirements of Item (1)(d)(ii) as the Project meets the requirements of specific customers and portions of the line is on property owned by someone other than the specific customer or applicant. The Project meets AEP's requirement of 138 kV service to Yager Substation. Additionally, the Project meets the requirements of AEP's specific customer as described on Page 2 of AEP's Letter of Notification submittal for the Yager Transmission Station Project, Case No. 15-1666-EL-BLN which indicates:

> "The purpose of this Project [AEP's Yager Substation Project] is to meet the needs of a specific customer. Utica East Ohio Midstream has requested an increase in load capacity from 20 MW to 63 MW at its existing Leesville Plant along Azalea Road west of the Village of Leesville, Carroll County, Ohio. An existing 69kV circuit currently serves the Leesville Plant. The 69kV system does not have the capacity to serve the significant load increase. This 138 kV project will allow AEP Ohio Transco to reliably serve the load increase of the customer."

4906-6-05 (B)(2): Need For the Project

The Project is needed to provide 138 kV supply to AEP's Yager Substation. The Need for installing Yager Substation is described in AEP's Letter of Notification submittal in

Case No. 15-1666-EL-BLN. These projects are both recommended by PJM under RTEP b2501.

4906-6-05 (B)(3): Location of the Project Relative to Existing or Proposed Lines

The location of the Project relative to existing or proposed lines is shown in the ATSI Transmission Network Map, included as part of the confidential portion of the FirstEnergy Corp. 2015 Long-Term Forecast Report. This map was submitted to the PUCO in Case No 15-0649-EL-FOR under OAC Rule 4901:5-5-04 (C)(2)(b). The map is incorporated by reference only. This map shows ATSI's 345 kV and 138 kV transmission lines and transmission substations including the Harmon-Holloway No. 1 138 kV Transmission Line and the Cloverdale-Holloway 138 kV Transmission Line. The Project area is located approximately 11 inches (11" x 17" printed version) from the left edge of the map and 6 $^{5}/_{8}$ inches (11" x 17" printed version) from the top of the map. The general location and layout of the Project area is shown in Exhibit 1 and 2.

4906-6-05 (B)(4): Alternatives Considered

The general area of the Project was carefully considered to identify potential routes for the Project that minimize potential impacts to the extent practical, meet the needs of the Project, and are constructible. Since AEP's proposed Yager Substation is located less than 500 feet (0.10 miles) from the existing Harmon-Holloway No. 1 and Cloverdale-Holloway 138 kV Transmission Lines and is constrained by geography at the bottom of a valley only one alternative route was developed. The alternative route would have moved the Coverdale-Yager 138 kV Transmission Line Extension to enter Yager Substation at the north side of the substation and follow along the proposed Harmon-Yager 138 kV Transmission Line Extension to connect to the existing transmission line. As part of the development of this Project, the alternative route was discussed with AEP. The alternative route was evaluated and ultimately not selected due to the need to accommodate both ATSI and AEP facilities. It was mutually agreed that the Project's proposed alignment was acceptable to AEP for the proposed Yager Substation and associated transmission lines.

4906-6-05 (B)(5): Public Information Program

ATSI's manager of External Affairs will advise local officials of features and the status of the proposed Transmission Line Project as necessary. ATSI will maintain a copy of this Letter of Notification on FirstEnergy's website. Letters will be sent to affect property owners at least 7 days before construction begins on the project informing them of the Project's start and a proposed timeframe of construction and restoration activities.

ATSI will publish a notice of the Project in the Harrison New-Herald, a local newspaper of general circulation within the Project Area. Additionally letters will be sent to affected property owners when this Letter of Notification is submitted to the Board informing them of the Project.

4906-6-05 (B)(6): Construction Schedule

The construction schedule for this Project is expected to begin as early as March 15, 2016 and completed by October 31, 2016.

4906-6-05 (B)(7): Area Map

Exhibit 1 depicts the general location of the Project. This Exhibit provides a partial copy of the United States Geological Survey, Carroll County OH, Harrison County OH quadrangle map (Quad Order ID 40081-D2). Exhibit 2 provides a partial copy of aerial imagery, DOQQ of the project area.

4906-6-05 (B)(8): Property Owner List

The Project will utilize existing right-of-way and new right-of-way. AEP will acquire new easements from RHDK Investments LLC and assign portions of their right-of-way to ATSI for the placement of the proposed lines. ATSI will obtain easements on AEP-owned property prior to construction. The property information for this Project is listed below in Table 1 and was obtained from the Harrison County Auditor's office.

Table 1. List of Affected Property Owners

Parcel Number	Property Owner	Property Address	Easement Status
15-0000076001	AEP Ohio Transmission Company	89991 Yager Rd, Dennison OH 44621	Easement to be Obtained
15-0000922005	AEP Ohio Transmission Company	Yager Rd.	Easement to be Obtained
15-0000548000	AEP Ohio Transmission Company	90425 Yager Rd, Dennison OH 44621	Easement to be Obtained
15-0000922006	AEP Ohio Transmission Company	Patterson Rd	Easement to be Obtained
15-0000922007	AEP Ohio Transmission Company	Yager Rd	Easement to be Obtained
15-0001003002	RHDK Investments LLC	Yager Rd	Easement to be assigned be AEP
15-0001000000	RHDK Investments LLC	Yager Rd	Easement to be assigned be AEP
15-0001003000	RHDK Investments LLC	Patterson Rd	Easement to be assigned be AEP

4906-6-05 (B)(9): TECHNICAL FEATURES OF THE PROJECT

4906-6-05 (B)(9)(a): Operating Characteristics

The transmission line construction will have the following characteristics:

Voltage: 138 kV

Conductors: 795 kcmil 26/7 ACSR

Static Wire: 7#8 Alumoweld

Insulators: Polymer

Structure Types: Exhibit 4: 138 kV Single Circuit Wood Pole, Deadend with Guying Structure. (Approximately four (4) structures are needed)

Exhibit 5: 138 kV Single Circuit Steel Pole, Deadend Structure. (Approximately two (2) structures are needed)

Exhibit 6: 138 kV Single Circuit Wood Pole, Tangent Structure. (Approximately four (4) structures are needed)

Exhibit 7: 138 kV Double Circuit Steel Pole, Deadend Structure. (Approximately one (1) structure is needed)

4906-6-05 (B)(9)(b): Electric and Magnetic Fields

The closest buildings to the Project location are located on AEP's property. There are plans to demolish the buildings during construction of Yager Substation and the associated facilities. The closest occupied residence or institution that is not planned to be demolished is approximately over 1,000 feet from the proposed transmission line centerline. Therefore, Electric and Magnetic Field ("EMF") calculations are not required to be included in this submittal.

4906-6-05 (B)(9)(c): Estimated Cost

The estimated capital cost for the proposed project is approximately $1,396,283.

4906-6-05 (B)(10): SOCIAL AND ECOLOGICAL IMPACTS

4906-6-05 (B)(10)(a): Land Uses

The Project is located in Monroe Township, Harrison County, Ohio. The main land use near the project is rural and agricultural. Based on the US Bureau of Census estimates, the 2010 population of the Monroe Township was 1,198. The 2010 population of Harrison County was 15,864. As the proposed Project involves looping two existing 138 kV Transmission Lines into Yager substation, no significant changes or impacts to the current land use is anticipated.

4906-6-05 (B)(10)(b): Agricultural Land

Agricultural land does exist within the Project's footprint. The RHDK Investments LLC properties that the proposed transmission lines cross are used as agricultural land. A list

of all agricultural land and acreage is provided below in Table 2. Both parcels contain open farm fields. As proposed, the project is expected to have minimal disturbance to the agricultural land.

Table 2. List of Agricultural Land Affect by the Project

Parcel Number	Property Owner	Acreage	Agricultural District	Agricultural District Expiration
15-0001000000	RHDK Investments LLC	59.64	No	N/A
15-0001003000	RHDK Investments LLC	42.96	No	N/A

4906-6-05 (B)(10)(c): Archaeological or Cultural Resources

As part of ATSI's investigation, a search of the Ohio Historic Preservation Office ("OHPO") online database was conducted to identify the existence of any significant archeological or cultural resource sites within 0.5 miles of the Project Area. A map of the cultural resource results of the search is shown in Exhibit 8. Specific location of any archeological resources are excluded from the map and are instead listed before.

The OHPO database includes all Ohio listings on the National Register of Historic Places ("NRHP"), including districts, sites, building, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The results of the search indicate that no listed NRHP sites were identified within 0.5 miles of the Project potential disturbance area.

The OHPO database also includes listings of the Ohio Archaeological Inventory ("OAI"), the Ohio Historic Inventory ("OHI"), previous cultural resource surveys, and the Ohio Genealogical Society ("OGS") cemetery inventory. Seven (7) OAI listed archeological resources have been previously inventoried within 0.5 miles of the Project area. A list of these OAI listed archeological resources is shown in Table 3. Two (2) OHI listed structural resources are located within 0.5 miles of the Project Area. A list of these OHI listed structural resources is shown in Table 4. Two (2) previous cultural resource

surveys were conducted within 0.5 miles of the Project Area. A list of the previous cultural resource surveys is provided in Table 5. One (1) OSG cemetery is located within 0.5 miles of the Project Area. Table 6 give detailed information on the cemetery. The cemetery is located less than 100 feet from the Project's potential disturbance area. Further information regarding the OGS cemetery is described below.

Table 3. List of OAI Listed Archeological Resources

OAI Number	Affiliation	Description	County	Quad Name
HN0125	Prehistoric	Unknown Prehistoric	Harrison	Bowerston
HN0126	Prehistoric	Unknown Prehistoric	Harrison	Bowerston
HN0127	Prehistoric	Late Archaic	Harrison	Bowerston
HN0128	Prehistoric	Unknown Prehistoric	Harrison	Bowerston
HN0129	Prehistoric	Unknown Prehistoric	Harrison	Bowerston
HN0131	Historic	Non-Aboriginal	Harrison	Bowerston
HN0132	Historic	Non-Aboriginal	Harrison	Bowerston

Table 4. List of OHI Listed Structural Resources

OAI Number	Present Name	Historic Use	County	Municipality
HAS0065001	Calvin Unger Barn	Agricultural Outbuildings	Harrison	Monroe Township
HAS0065101	Calvin Unger Drift Mine Complex	Extractive Facility or Site	Harrison	Monroe Township

Table 5. List of Previous Cultural Resource Survey

Year	Name	County	Municipality
2003	Phase I Cultural Resource Management Survey of a Proposed 12.1 ha (30 a.) Permit Application #D-2166 in Monroe Township, Harrison County, Ohio	Harrison	Monroe Township
2004	Phase I Archaeological Survey of the Proposed Penn-Ohio Coal Company (dba Kimble Clay & Limestone) Adjacent Area Permit Application D-2166-1, Monroe Township, Harrison County, Ohio	Harrison	Monroe Township

Table 6. List of OGS cemeteries

OGS ID	Name	County	Location
5010	McMillen	Harrison	Not Confident

Detailed information on the OPHO online database and the OGS website indicated that the location of the cemetery is not defined with a high degree of confidence. As part of ATSI's investigation, ATSI retained AECOM to conduct an archival review and a limited Phase I level field investigation of any areas proposed for ground disturbance in the vicinity of the OGS cemetery location. Once this investigation is completed, a copy of AECOM's report will be docketed with the Board.

There are no NRHP sites located within 0.5 miles of the Project's potential disturbance area. None of the OAI listed or OHI listed resources are located within the Project's potential disturbance area. One of the previous cultural resource surveys is located within the Project's potential disturbance area, and that survey concluded that no cultural resources were found in the Project's potential disturbance area. Therefore with the potential exception of the OSG cemetery located within 100 feet of the Project's potential disturbance area, significant impacts to archaeological and cultural resources are not anticipated.

4906-6-05 (B)(10)(d): Local, State, and Federal Requirements

There are no known local, or federal agency requirements that must be met prior to the commencement of construction on the proposed Project. There is one known state agency requirement that must be met prior to the commencement of construction on the proposed Project. Table 7 shows the list of government agency requirements and the filing status at the time of filing.

Table 7. List of Government Agency Requirements Require Before Construction

Agency	Permit Requirement	Status
Ohio EPA	General NPDES Construction Strom Water Permit	Will be Filed

4906-6-05 (B)(10)(e): Endangered, Threatened, and Rare Species Investigation

As part of the investigation, a request was submitted to the Ohio Department of Natural Resources-Division of Wildlife ("ODNR") on September 28, 2015, to research the presence of any endangered, threatened, or rare species within one (1) mile of the Project area. The ODNR's response on September 29, 2015 indicated that they have no records of these species within one mile of the identified project area. Because ODNR has determined that the information contained in the Agency's response could be detrimental to the conservation of a species or unique natural feature, and pursuant to Section 1531.04 of the Ohio Revised Code and the request of ODNR, the ODNR response is not attached.

Additionally, a search of the US Fish and Wildlife ("USFW") online Ohio County Distribution List of Endangered Species returned two endangered or threatened species in Harrison County, Ohio. The endangered species is the Indiana Bat (*Myotis sodalis*) and the threatened species is the Northern Long-eared Bat (*Myotis septentrionalis*). Bat tree surveys were conducted by AECOM under contract with AEP. AEP has identified the presence of several potential bat roost trees within the Project area. Because of the

presence of potentially suitable habitat for protected bat species, the implementation of seasonal tree cutting between October 1st and March 31st is planned. In the event of a delay in schedule that does not allow clearing to be completed during this timeframe, additional coordination with USFW will be implemented.

4906-6-05 (B)(10)(f): Areas of Ecological Concern

As part of the investigation, a request was submitted to the Ohio Department of Natural Resources Division of Wildlife ("ODNR") on September 28, 2015, to research the presence of any unique ecological sites, geological features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, parks or forest, national wildlife refuges, or other protected natural areas within one (1) mile of the project area. The ODNR's September 29, 2015 response indicated that they have no records of the aforementioned areas within one mile of the identified project area.

As part of their investigation, AEP contracted AECOM to conduct a wetland delineation and stream assessment on their 27 acre parcel encompassing the proposed Yager substation project limits. Within that parcel, AECOM identified 4 streams totaling 3,151 linear feet, no wetlands, and no ponds.

ATSI contracted AECOM to conduct a wetland delineation and stream assessment on the proposed Project limits for the transmission line loops. The ATSI investigation focused on a 10 acre area immediately west of the AEP proposed project limits. AECOM identified 2 streams totaling 838 linear feet, no wetland, and no ponds within the ATSI project limits. Details of those findings can be found in Appendix A.

The proposed Nottingham-Yager #1 138 kV Transmission Line loop and Nottingham-Yager #2 138 kV Transmission Line loop will aerially span Stream 2 on AEP's stream assessment to the south of the proposed Yager substation. The proposed Harmon-Yager 138 kV Transmission Line will span Stream 1 on AEP's stream assessment to the north of the proposed Yager Substation. The proposed Harmon-Yager 138 kV Transmission

Line will also span Stream 2 on ATSI's stream assessment to the west of the proposed Yager Substation on RHDK Investments LLC owned property.

A construction access plan will be developed as part of the project design to avoid or minimize disturbance of the streams. If any streams must be crossed during construction, appropriate Best Management Practices ("BMPs") such as temporary bridging with construction matting, will be implemented to avoid impacts. Construction activities will be implemented in accordance with construction storm water permit requirements. All applicable permits will be secured before construction.

4906-6-05 (B)(10)(g): Other Information

Construction and operation of the proposed Project will be in accordance with the requirements specified in the latest revision of the National Electrical Safety Code as adopted by the Public Utilities Commission of Ohio ("PUCO") and will meet all applicable safety standards established by the Occupational Safety and Health Administration ("OSHA").

No other or unusual conditions are expected that will result in significant environmental, social, health, or safety impacts.

4906-6-07: Documentation of Letter of Notification Transmittal and Availability for Public Review

This Letter of Notification is being provided concurrently with its filing with the Board to the following officials in the Monroe Township, Harrison County, Ohio and the noted libraries.

Harrison County

Mr. Dale Ray Norris, Chairman
Harrison County Commissioner
100 W. Market St.
Cadiz, OH 43907

Mr. William H. Host
Harrison County Commissioner
100 W. Market St.
Cadiz, OH 43907

Mr. Don Rae Bethel
Harrison County Commissioner
100 W. Market St.
Cadiz, OH 43907

Mr. Robert Kendall Sterling
Harrison County Engineer
100 W. Market St.
Cadiz, OH 43907

Monroe Township

Mr. Bart Alan Busby
Monroe Township Trustee
601 Busby Dr.
Bowerston, OH 44695

Mr. Ralph T. Ferguson
Monroe Township Trustee
88290 Plum Run Rd.
Uhrichsville, OH 44683

Mr. Gene Busby
Monroe Township Trustee
34060 Scio Bowerston Rd.
Bowerston, OH 44695

Ms. Ashley Marie Peters
Monroe Township Fiscal Officer
32501 Gundy Ridge Rd.
Uhrichsville, OH 44683

Libraries

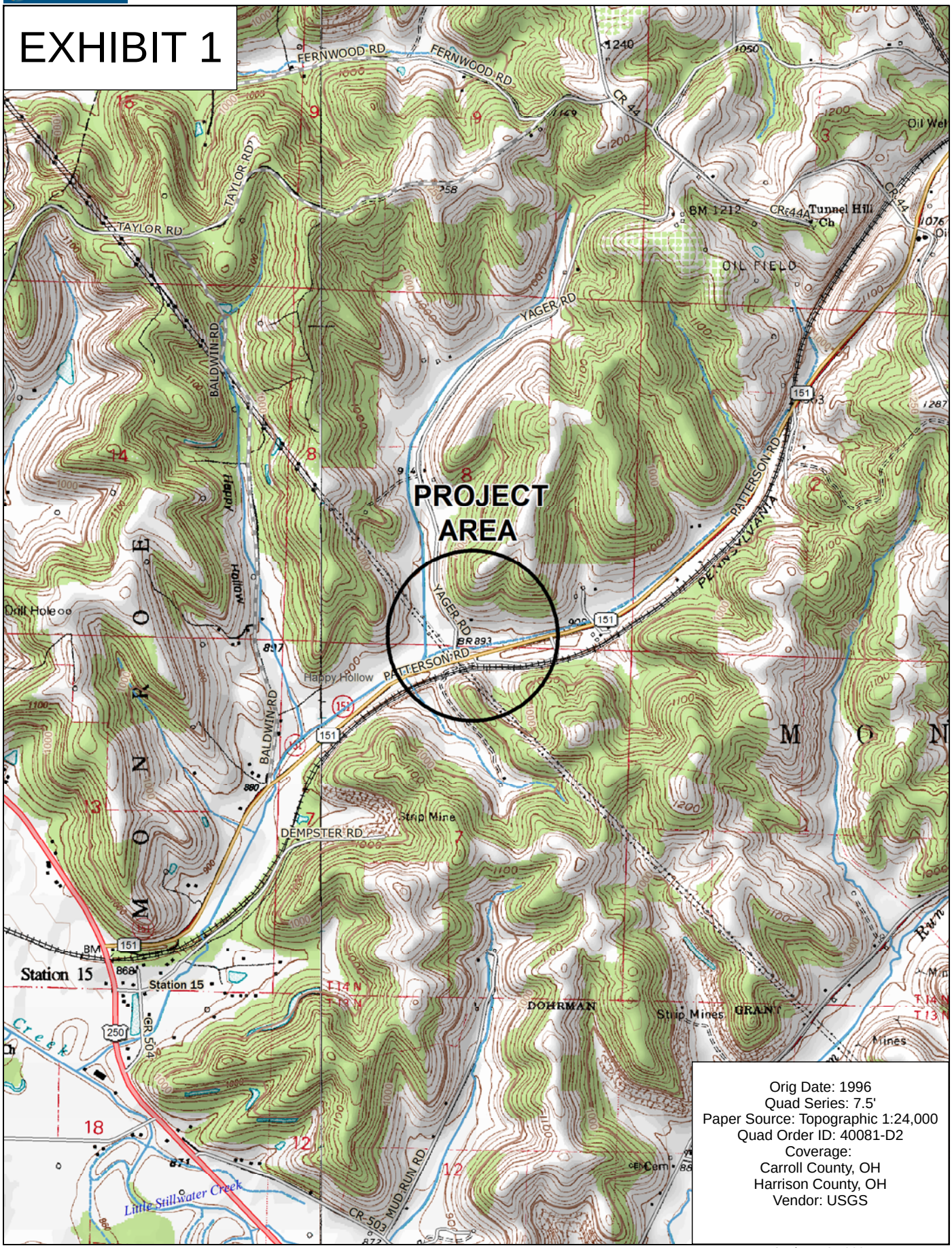
Mr. William W. Titley, President
Bowerston Public Library
200 Main St
Bowerston, OH 44695

Ms. Sandi Thompson, Director
Puskarich Public Library
200 East Market Street
Cadiz, OH 44695

Copies of the transmittal letters to these officials have been included with the transmittal letter submitting this Letter of Notification to the Board, and are being provided to meet the requirement of OAC 4906-6-07 (B) to provide the Board with proof of compliance with the notice requirement to local officials in OAC Rule 4906-6-07 (A)(1) and to libraries at OAC Rule 4906-6-07 (A)(2).

Information is posted at www.firstenergycorp.com/about/transmission_project/ohio.html on how to request an electronic or paper copy of this Letter of Notification. The link to the website is being provided to meet the requirement of OAC Rule 4906-6-07 (B) and to provide the Board with proof of compliance with the notice requirements in OAC Rule 4906-6-07 (A)(3).

EXHIBIT 1



Orig Date: 1996
Quad Series: 7.5'
Paper Source: Topographic 1:24,000
Quad Order ID: 40081-D2
Coverage:
Carroll County, OH
Harrison County, OH
Vendor: USGS

TN
MN (8.5°W)

Scale 1 : 24,000

1" = 2,000.0 ft

Data Zoom 13-0

EXHIBIT 2

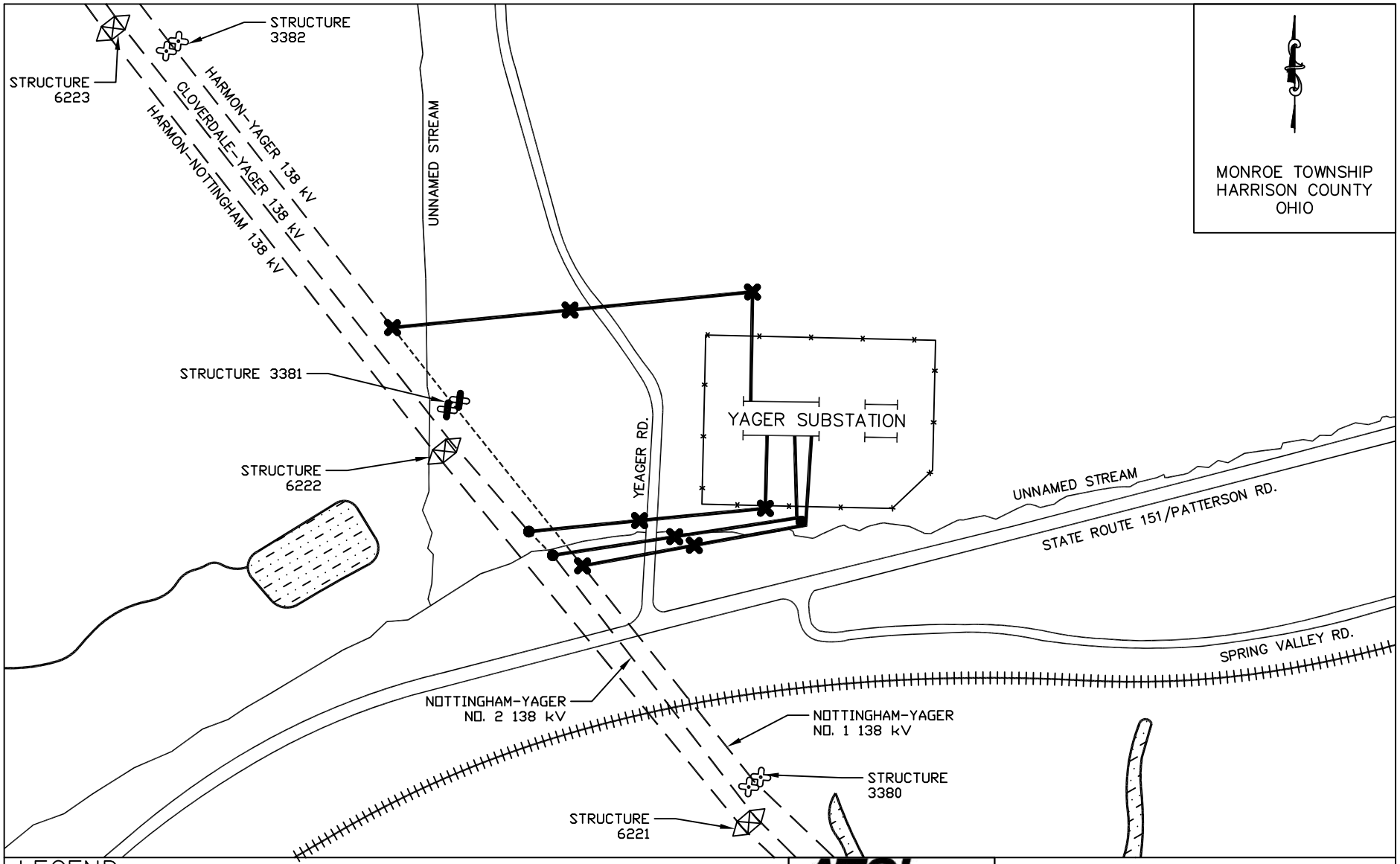
TN

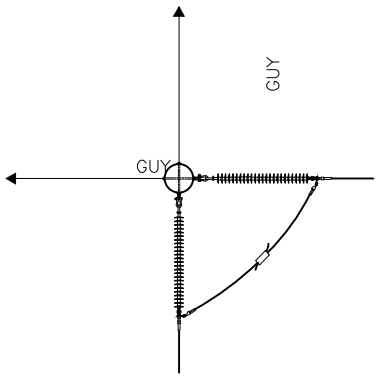
MN (8.5°W)

Scale 1 : 24,000

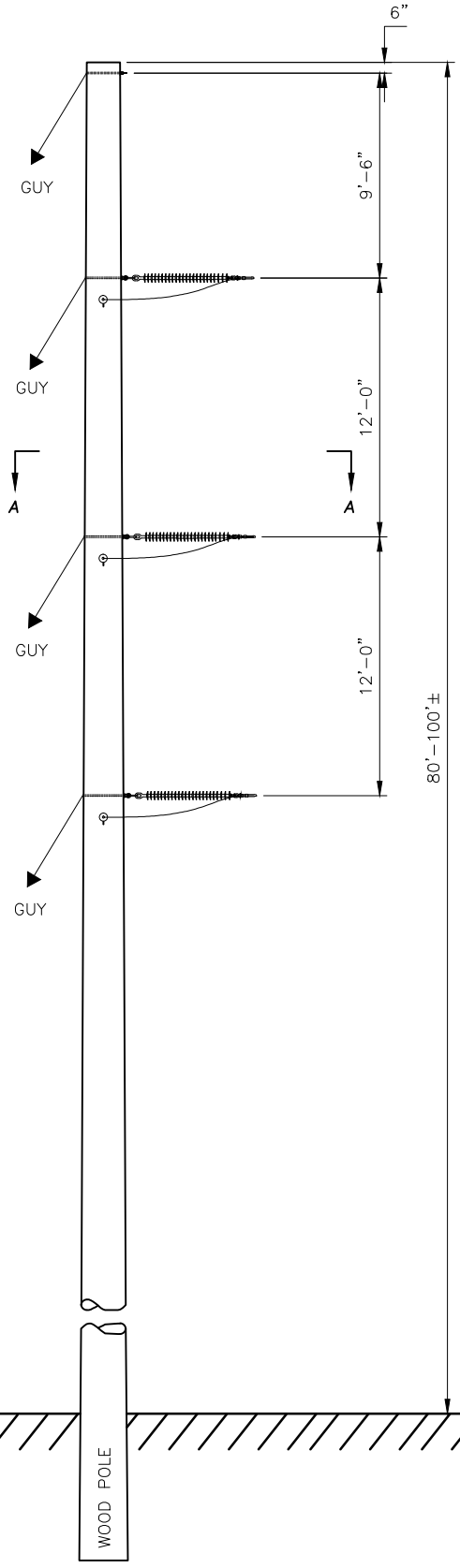
1" = 2,000.0 ft

Data Zoom 13-0


STRUCTURE 3382
STRUCTURE 6223
HARMON-YAGER 138 kV
CLOVERDALE-YAGER 138 kV
HARMON-NOTTINGHAM 138 kV
UNNAMED STREAM
STRUCTURE 3381
STRUCTURE 6222
YEAGER RD.
YAGER SUBSTATION
UNNAMED STREAM
STATE ROUTE 151/PATTERSON RD.
SPRING VALLEY RD.
NOTTINGHAM-YAGER NO. 2 138 kV
NOTTINGHAM-YAGER NO. 1 138 kV
STRUCTURE 3380
STRUCTURE 6221
MONROE TOWNSHIP
HARRISON COUNTY
OHIO
LEGEND
EXISTING CONDUCTOR
EXISTING CONDUCTOR TO BE REMOVED
NEW CONDUCTOR
RAILROAD
SUBSTATION FENCE LINE
EXISTING STREAM
EXISTING 2-POLE WOOD STRUCTURE
EXISTING CONDUCTOR STEEL LATTICE STRUCTURE
EXISTING 2-POLE WOOD STRUCTURE TO BE REMOVED
NEW SINGLE POLE WOOD STRUCTURE
NEW SINGLE POLE STEEL STRUCTURE
EXISTING POND/LAKE
ATSI
American Transmission Systems, Inc
a subsidiary of FirstEnergy Corp.
138 kV TRANSMISSION LINE
LOOPS TO YAGER SUBSTATION
GENERAL LAYOUT
EXHIBIT 3



SECTION A – A



**NOT TO SCALE

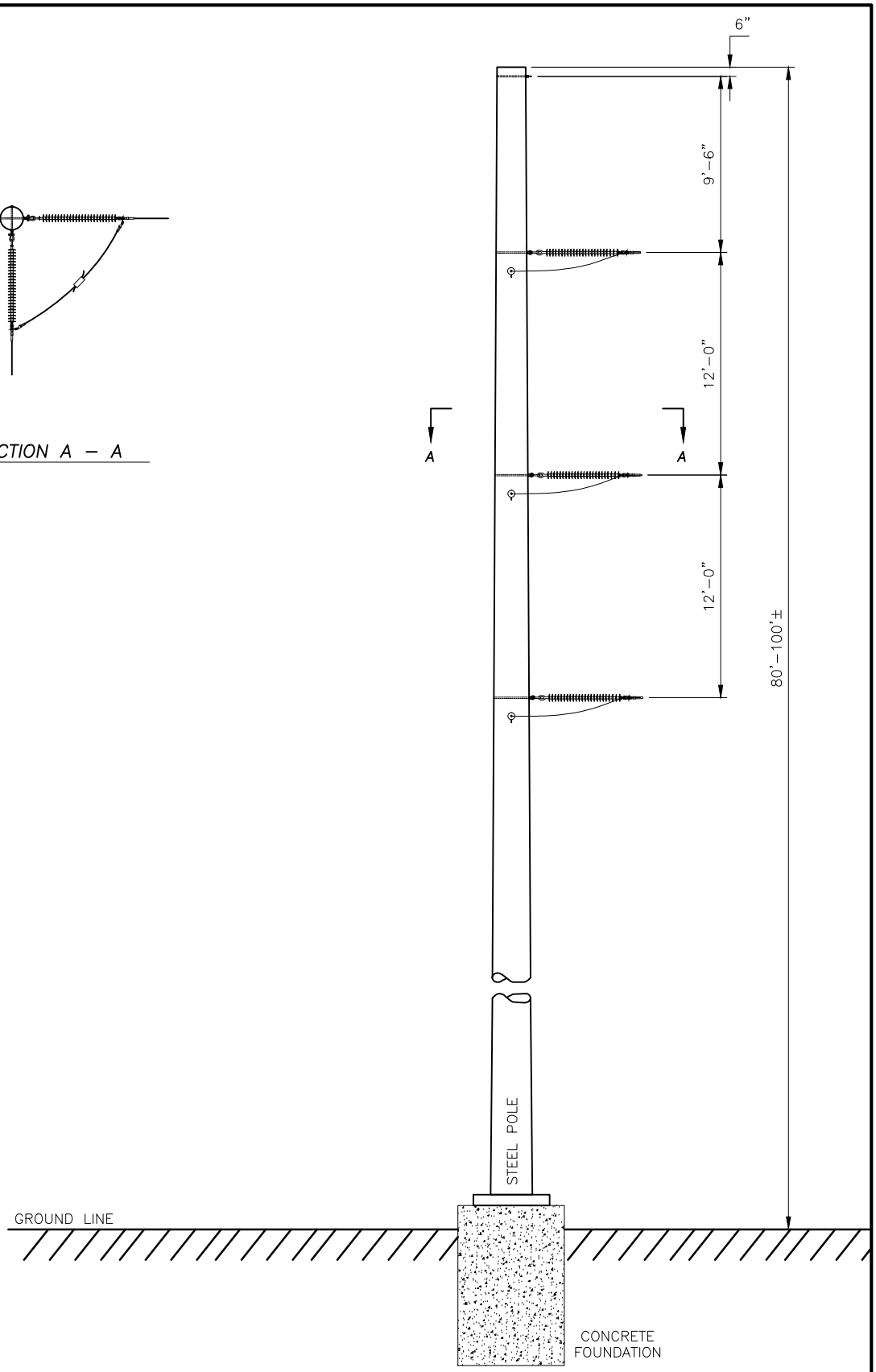
ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.

138kV TRANSMISSION LINE
LOOPS TO AEP YAGER SUBSTATION

138kV SINGLE CIRCUIT WOOD POLE, DEADEND WITH GUYING

EXHIBIT 4

SECTION A – A



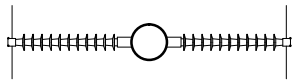
ATSI®
American Transmission Systems, Inc.
a subsidiary of FirstEnergy Corp.

138kV TRANSMISSION LINE
LOOPS TO AEP YAGER SUBSTATION

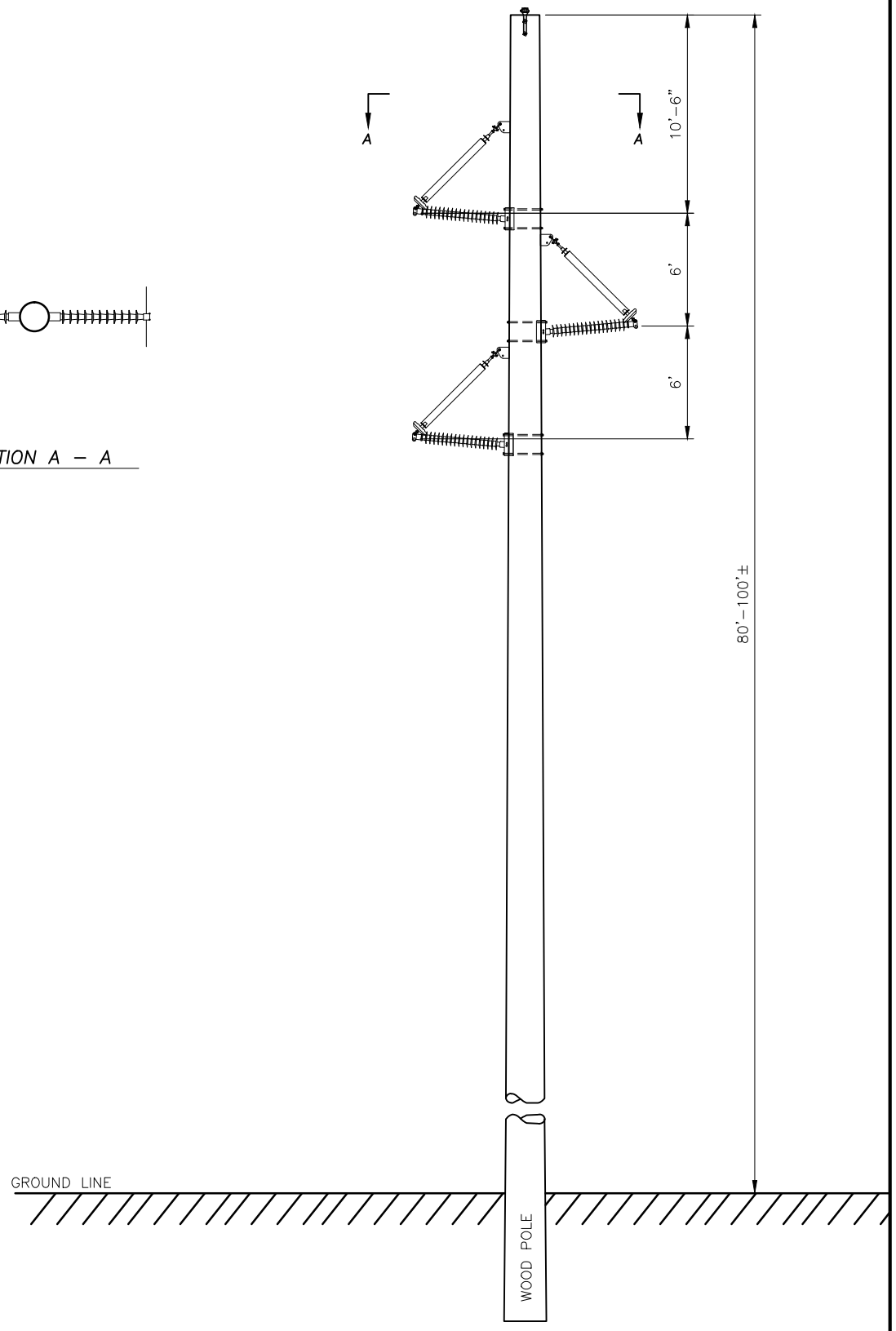
**NOT TO SCALE

138kV SINGLE CIRCUIT WOOD POLE, DEADEND

EXHIBIT 5



SECTION A – A



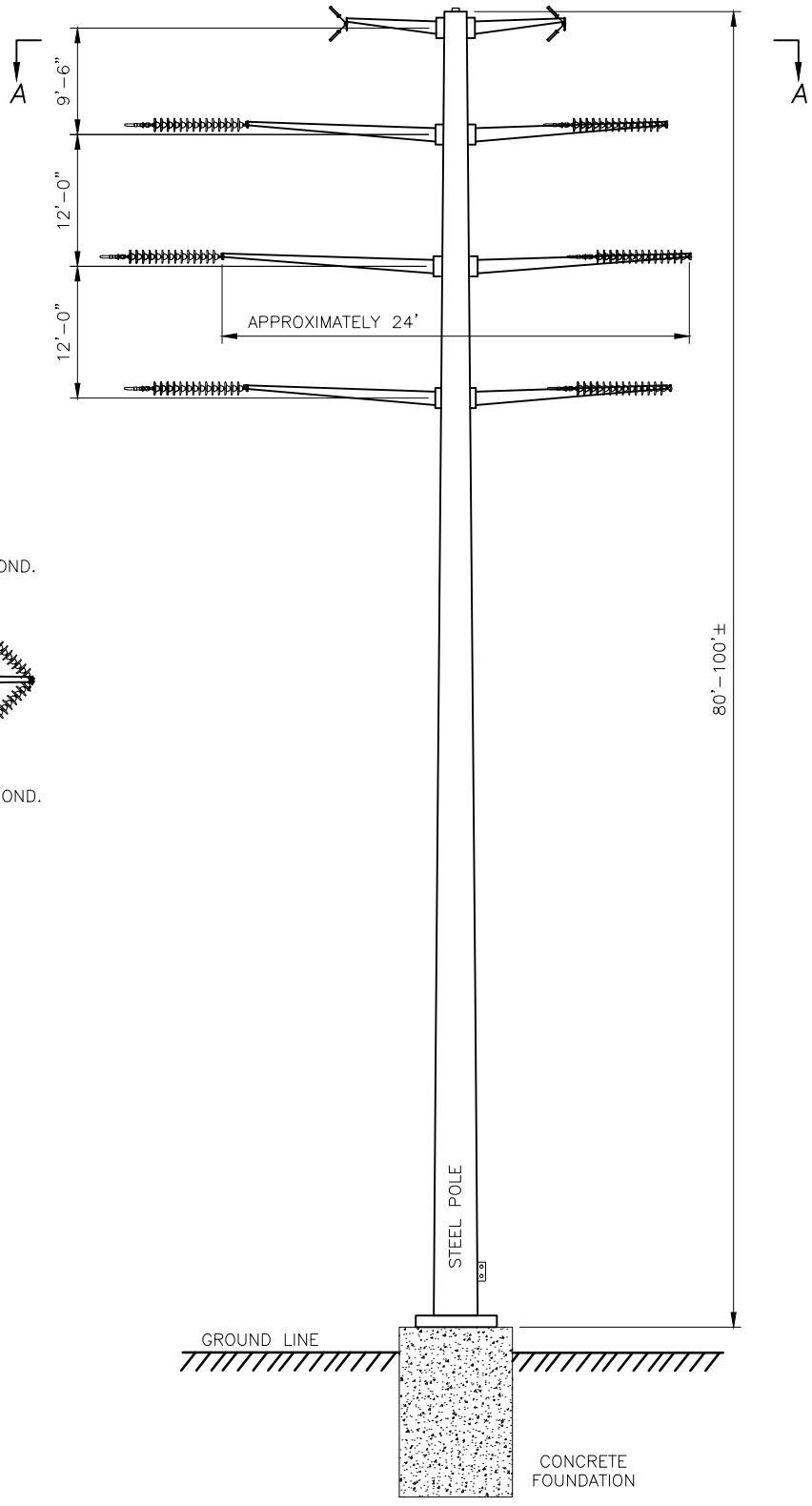
**NOT TO SCALE

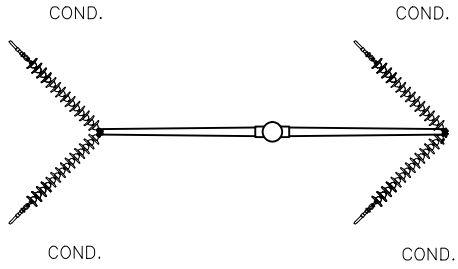
ATSI®
American Transmission Systems, Inc.
a subsidiary of FirstEnergy Corp.

138kV TRANSMISSION LINE
LOOPS TO AEP YAGER SUBSTATION

138kV SINGLE CIRCUIT WOOD POLE, TANGENT

EXHIBIT 6





SECTION A – A

NOTE:
DETAILS DEPICTED IN FIGURE CAN BE APPLIED FOR ANY TYPE OF STEEL POLE CONFIGURATION.

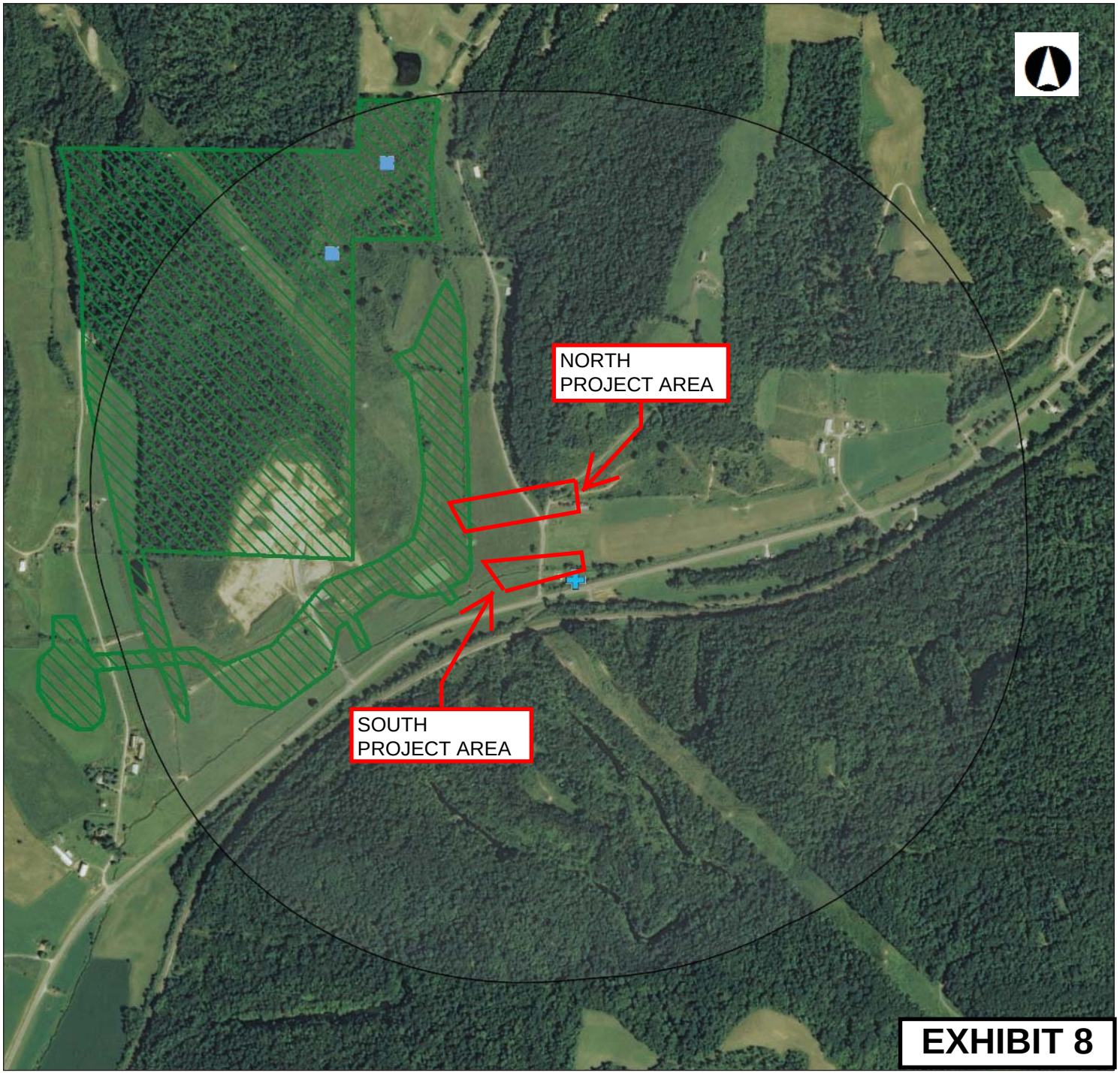
**NOT TO SCALE

ATSI®
American Transmission Systems, Inc.
a subsidiary of FirstEnergy Corp.

138kV TRANSMISSION LINE
LOOPS TO AEP YAGER SUBSTATION

138kV DOUBLE CIRCUIT STEEL POLE, DEADEND

EXHIBIT 7



Ohio Historic Preservation Office

Legend

- NR Listings
  - Listed
  - National Historic Landmark
  - Delisted
- NR Determinations of Eligibi
- Historic Structures
- Historic Bridges
- Historic Tax Credit Projects
- OGS Cemeteries
- Dams
- UTM Zone Split
- NR Boundaries
- Phase 1
- Phase 2
- Phase 3
- Historic Previously Surveyed
- Highways
- Counties

0 0.19 0.38 Miles

1: 15,000

Copyright/Disclaimer

Datum: [Datum]

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

138 kV Transmission Lines Loops to Yager Substation Project
Case Number 16-0257-EL-BLN

Date: February 12, 2016

Appendix 1
Wetland Delineation and Stream Assessment Report

YAGER SUBSTATION 138 KV TRANSMISSION LINE LOOP PROJECT

WETLAND DELINEATION AND STREAM ASSESSMENT REPORT

Prepared for:

76 South Main Street
Akron, Ohio 44308

525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

February 2016

TABLE OF CONTENTS

FIGURES

Number

APPENDICES

Appendix

LIST OF ACRONYMS and ABBREVIATIONS

AEP	American Electric Power
ATSI	American Transmission Systems, Inc.
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PHWH	Primary Headwater Habitat
PSS	Palustrine scrub/shrub
QHEI	Qualitative Habitat Evaluation Index
ROW	Right-of-way
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

American Transmission Systems, Inc. (ATSI), a FirstEnergy Company, is proposing a 138 kV electric transmission line loop into the proposed American Electric Power (AEP) Yager Substation in Harrison County, Ohio. The Project is located immediately northwest of the intersection of Patterson and Yager Roads, and is referred to as the Yager Substation 138 kV Transmission Line Loop Project (Project). AECOM delineated an approximately ten acre Project survey area as illustrated on Figure 1.

Land uses within the Project survey area were assigned a general classification based upon the principal land characteristics as observed within a given area, aerial photograph review, and field surveys. General land use types near the proposed Project area include mowed field, deciduous forest, and roadway.

2.0 METHODOLOGY

The purpose of the field survey was to assess whether wetlands and other "waters of the U.S." exist within the approximately ten acre Project survey area. Prior to conducting the field survey, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed as an exercise to identify the occurrence and location of potential wetland areas.

On December 4th, 2015, AECOM biologists walked the Project survey area to conduct a wetland delineation and stream assessment. During the field survey, the physical boundaries of observed water features were recorded using sub-decimeter accurate Trimble Global Positioning System (GPS) units. The GPS data was then imported into ArcMap GIS software, where the data was then reviewed and edited for accuracy.

The information contained in this wetland delineation report is for a study area that may be much larger than the actual Project limits-of-disturbance; therefore, lengths and acreages listed in this report may not constitute the actual impacts of the Project defined in subsequent permit applications. If necessary, a separate report that identifies the actual Project impacts will be provided with agency submittals

2.1 WETLAND DELINEATION

The Project survey area was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) *1987 Wetland Delineation Manual* (*1987 Manual*) (Environmental

Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version2.0)* (*Regional Supplement*) (USACE, 2012). The *Regional Supplement* was released in April 2012 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The *1987 Manual and Regional Supplement* define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data was not available for any of the identified wetlands, AECOM utilized the routine delineation method described in the *1987 Manual* and *Regional Supplement* that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. The methodology used to examine each parameter is described in the following sections.

2.1.1 SOILS

Soils were extracted using a spade shovel to examine soil samples for hydric soil characteristics. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 2000) was used to identify the hue, value, and chroma of the matrix and mottles of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987). In sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

2.1.2 HYDROLOGY

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (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* states that the 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) soil temperature (12-in. depth) is 41 degrees Fahrenheit (^{o}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 growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28 ^{o}F air temperature in the spring and fall, respectively. The National Weather Service WETS data obtained from the NRCS National Water and Climate Center reveals that in an average year, this period lasts from April 14 to October 29, or 197 days. In the Project area, five percent of the growing season equates to approximately ten days.

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement.* Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as, drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2012).

Review of USDA watershed data indicates that the Project is located within the Middle Little Stillwater Creek Watershed of the Little Stillwater Creek Subregion (USDA, 2014).

2.1.3 VEGETATION

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the U.S. Army Corps of Engineers *2014 National Wetland Plant List: Eastern Mountains and Piedmont Region,* which encompasses the area of the Project. An area was determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species were OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the composition of the dominant species was FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests are used to evaluate if a wetland has a predominance of hydrophytic vegetation.

Recent USACE guidance indicates that to the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year (USACE, 2011).

Vegetation sampling for wetland delineation can be challenging when some plants are covered by snow or die back due to freezing temperatures or other factors (USACE, 2011). The end of

the growing season is indicated when woody deciduous species lose their leaves or the last herbaceous plants cease flowering and their leaves become dry or brown, whichever occurs latest. The wetland delineation field work within the Project area was conducted after the occurrence of these events and therefore, outside the normal growing season. Conducting a wetland delineation outside the normal growing season can make identifying the wetland/upland boundary more challenging and may require further assessment during the next growing season.

2.1.4 WETLAND CLASSIFICATIONS

Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). It is anticipated that identified wetlands within the survey area would be classified as freshwater, Palustrine systems, which include nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. No wetlands were identified within the Project survey area.

2.1.5 OHIO RAPID ASSESSMENT METHOD v. 5.0

The Ohio Environmental Protection Agency (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). No wetlands were identified within the Project survey area.

Category 1 Wetlands

Category 1 wetlands “…support minimal wildlife habitat, hydrological and recreational functions…” (Mack, 2001), and “…do not provide for or contain critical habitats for threatened or endangered species…” (Mack, 2001). In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to

be a resource that has been severely degraded or has a limited potential for restoration, or are of low ecological functionality.

Category 2 Wetlands

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," (Mack, 2001) and are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions…" (Mack, 2001). Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past, but have been degraded to Category 2 status.

Category 3 Wetlands

Wetlands that are assigned to Category 3 have "...superior habitat, or superior hydrological or recreational functions…" (Mack, 2001). They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. It is important to stress that a wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit "superior" hydrologic functions (e.g. flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

2.2 STREAM CROSSINGS

Regulatory activities under the Clean Water Act provide authority for states to issue water quality standards and "designated uses" to all waters of the U.S. 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 USACE defines OHWM as the "line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (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* (Davic, 2012).

2.2.1 OEPA QUALITATIVE HABITAT EVALUATION INDEX

The qualitative habitat evaluation index (QHEI) 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 qualitative 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 Ohio EPA 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). No QHEI assessments were conducted during the field delineation.

2.2.2 OHIO EPA 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)" (Davic, 2012).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments 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". Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the Ohio EPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (Davic, 2012). Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream.

Class 1 PHWH Streams: Class 1 PHWH Streams are those that have "normally dry channels with little or no aquatic life present" (Davic, 2012). These waterways are usually ephemeral, with water present for short periods of time due to infiltration from snowmelts or rainwater runoff.

Class 2 PHWH Streams: Class 2 PHWH Streams are equivalent to "warm-water habitat" streams. This stream class has a "moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis" (Davic, 2012). These species communities are composed of vertebrates (fish and salamanders) and/or benthic macroinvertebrates that are considered pioneering, headwater temporary, and/or temperature facultative species.

Class 3 PHWH Streams: Class 3 PHWH Streams usually have perennial water flow with cool-cold water adapted native fauna. The community of Class 3 PHWH Streams is comprised of vertebrates (either cold water adapted species of headwater fish and or obligate aquatic species of salamanders, with larval stages present), and/or a diverse community of benthic cool water adapted macroinvertebrates present in the stream continuously (on an annual basis).

Results of the HHEI assessments are discussed in Section 3.2.2 of this report.

3.0 RESULTS

Within the approximately ten acre Project survey area, AECOM delineated two streams and no wetlands. The delineated streams are discussed in detail in the following sections.

3.1 WETLAND DELINEATION

3.1.1 Preliminary Soils Evaluation

According to the USDA/NRCS Web Soil Survey of Harrison County, Ohio (NRCS 2015), three soil series; Coshocton, Glenford and Orville were mapped within the Project survey area. More specifically, three Soil Map Units were mapped within Project survey area; Coshocton silt loam (symbol: CnD), Glenford silt loam (symbol: GsC) and Orville silt loam (symbol: Or). None of the Soil Map Units were found to meet hydric criteria (NRCS, 2015). Soil map units located within the Project survey area are shown on Figure 2.

3.1.2 National Wetland Inventory Map Review

National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been 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 website states that the 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. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI map of the Bowerston, Ohio quadrangle, the Project survey area does not include any mapped NWI wetlands. Three Palustrine Unconsolidated Bottom Intermittently Exposed wetlands (PUBG) were mapped approximately 375 feet southeast of the Project survey area. The location and approximate extent of the mapped NWI wetlands are shown on Figure 2.

3.1.3 Delineated Wetlands

No wetlands were delineated within the ten acre Project survey area.

3.2 STREAM CROSSINGS

AECOM identified two streams (Stream 1 and Stream 2) totaling approximately 838 linear feet within the Project survey area. The identified streams both exhibited a perennial flow regime, and both were assessed using the QHEI methodology (drainage area greater than 1 mi^2). The location of the streams within the Project survey area are shown in Figure 3.

3.2.1 Qualitative Habitat Evaluation Index

Field surveys along the Project survey corridor identified two QHEI assessed streams. Stream 1 totaling approximately 321 linear feet was assigned a score of 44 and a narrative rating of Fair Warmwater Habitat. Stream 2 totaling approximately 517 linear feet was assigned a score of 28 and a narrative rating of Very Poor Warmwater Habitat.

Forms for the streams assessed using the QHEI methodology are provided in Appendix A. Color photographs were taken of the streams during the field survey and are provided in Appendix B.

Very Poor Warmwater Habitat Stream -- The substrates of Stream 2 were generally dominated by silt with smaller percentages of hardpan and detritis. The stream showed evidence of moderate bank erosion, no development, no sinuosity, and the presence of in-stream cover such as: overhanging vegetation and shallows in slow water. Pool depth did not exceed 16 inches and bankfull width was approximately eight feet on average.

Fair Warmwater Habitat Stream –The substrates of Stream 1 were generally dominated by sand and silt with smaller percentages of gravel and cobble. The stream showed evidence of moderate bank erosion, good development, moderate sinuosity and the presence of in-stream cover such as: undercut banks, overhanging vegetation, rootmats and aquatic macrophytes. Pool depth did not exceed 18 inches and bankfull width was approximately eight feet on average.

3.2.2 Primary Headwater Habitat Evaluation Index

No HHEI streams were identified within Project survey area.

4.0 SUMMARY

On December 4th, 2015, AECOM biologists walked the Project survey area to conduct a wetland delineation and stream assessment. The AECOM biologists conducting the work are qualified to delineate wetlands and assess streams as a result of completed trainings and experience with methodologies and conducting numerous assessments throughout Ohio and the region.

The delineation of the approximately ten acre Project survey area identified two perennial streams totaling approximately 838 linear feet. The two identified streams, Stream 1 and Stream 2, were assessed using the QHEI methodology (drainage area greater than 1 mi^2). Stream 1 totaling approximately 321 linear feet was assigned a score of 44 and a narrative rating of Fair Warmwater Habitat. Stream 2 totaling approximately 517 linear feet was assigned a score of 28 and a narrative rating of Very Poor Warmwater Habitat. No streams were assessed using the HHEI methodology (drainage area less than 1 mi^2). No wetlands were delineated within the Project survey area.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which AECOM is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of AECOM.

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.

Davic, Robert D. 2012. *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams. Final Version 3.0*. Ohio Environmental Protection Agency, Division of Surface Water, Columbus, Ohio.

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.

Fritz, K.M., Johnson, B.R., and Walters, D.M. 2006. *Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams. EPA/600/ R-06/126*. U.S. Environmental Protection Agency, Office of Research and Development, Washington DC.

Kollmorgen Corporation. 2000. Munsell Soil Color Charts. Baltimore, Maryland.

Mack, John J. 2001. *Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Ohio EPA Technical Report WET/2001-1*. Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, Columbus, Ohio.

Rankin, Edward T. 2006. *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI).* Ohio EPA Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.

U.S. Army Corps of Engineers. 2005. Regulatory Guidance Letter No. 05-05: Guidance on Ordinary High Water Mark Identification.

U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J.R. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Army Corps of Engineers. 2014. National Wetland Plant List, version 3.2 http://wetland_plants.usace.army.mil/ : Accessed 01/14/16.

U.S. Department of Agriculture, Natural Resources Conservation Service, 2015. National Hydric Soils List by State. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/ Accessed 01/14/16.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. National Weather Service- Wetland Climate Evaluation Database (WETS Table). http://www.wcc.nrcs.usda.gov/climate/wetlands.html : Accessed 01/14/16

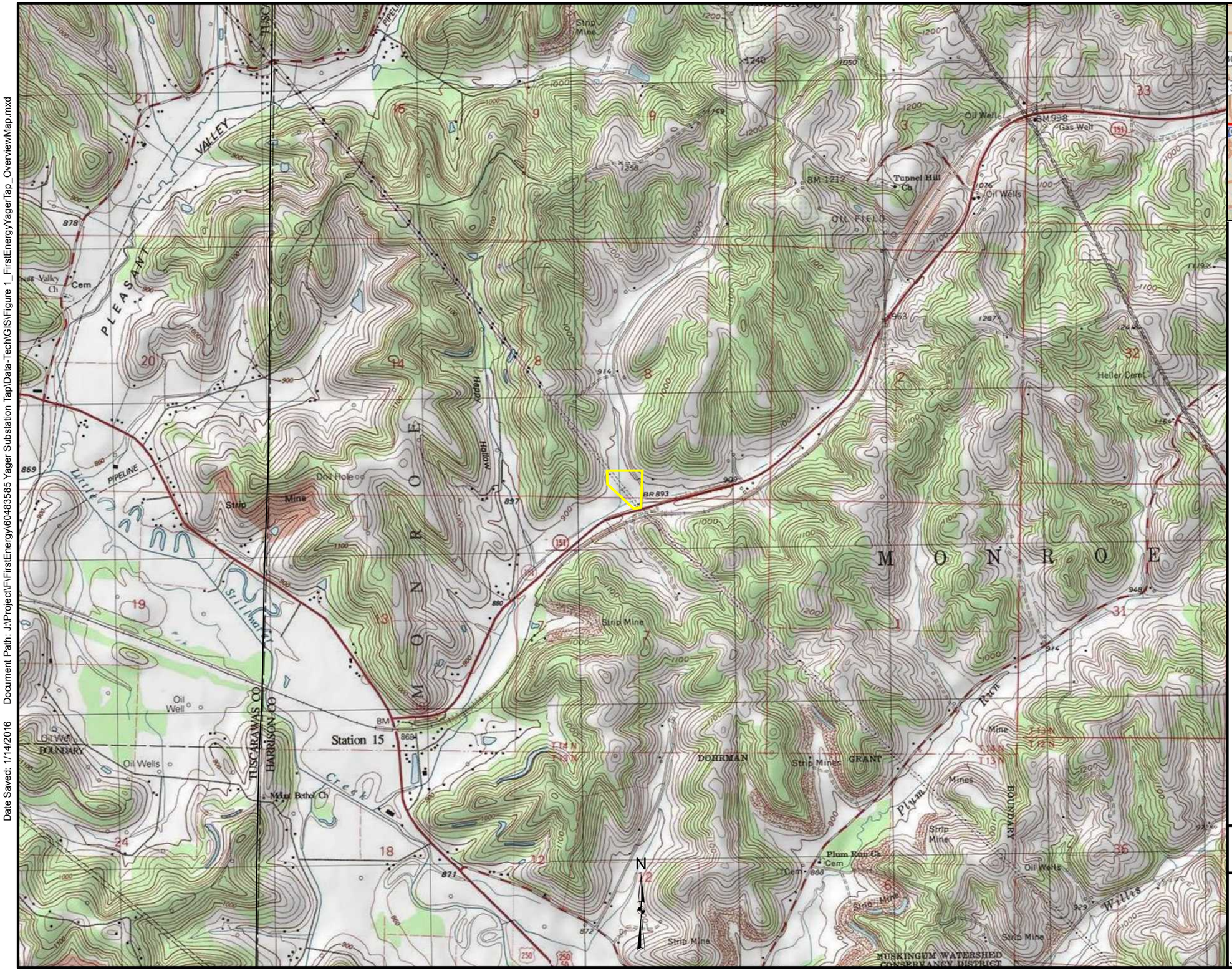
U.S. Department of Agriculture, Natural Resources Conservation Service. 2015. Web Soil Survey (GIS Shapefile). http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx Accessed 01/14/16

U.S. Fish and Wildlife Service. 2010. National Wetlands Inventory Branch of Resource and Mapping Service. http://107.20.228.18/decoders/wetlands.aspx Accessed 01/14/16

U.S. Fish and Wildlife Service. 2015. National Wetlands Inventory Branch of Resource and Mapping Service. http://www.fws.gov/wetlands/Data/State-Downloads.html Accessed 01/14/16

U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. 12-digit Watershed Boundary Dataset (GIS Shapefile). https://gdg.sc.egov.usda.gov . Accessed 01/14/16.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. 10-digit Watershed Boundary Dataset in HUC8 (GIS Shapefile). https://gdg.sc.egov.usda.gov . Accessed 01/14/16.



LEGEND

Project Survey Boundary

N

0 2,000 4,000

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online, USA Topo Maps

Yager Substation 138 kV
Transmission Line Loop Project

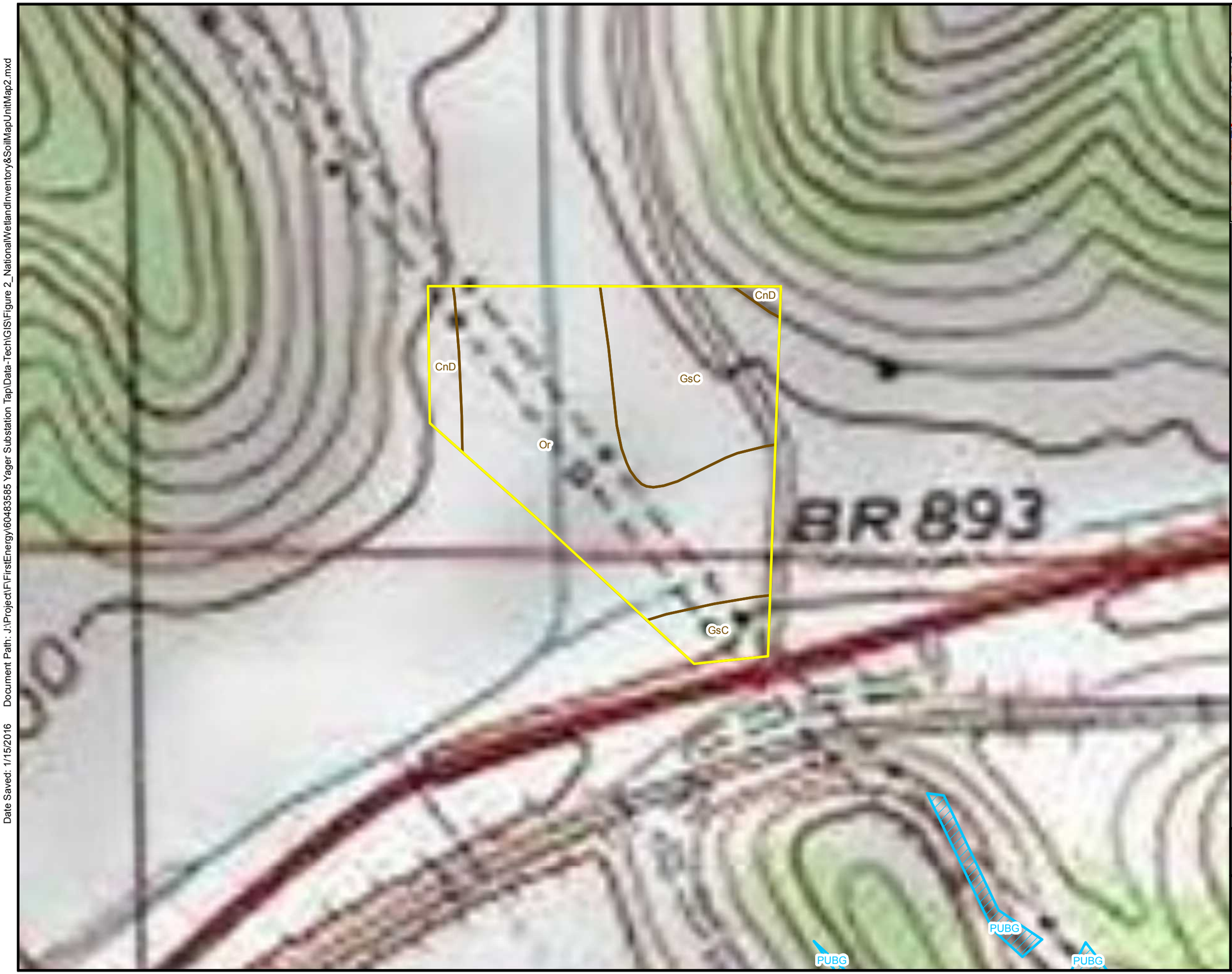
FIGURE 1
OVERVIEW MAP

JOB NO. 60483585

AECOM

Date Saved: 1/14/2016 Document Path: J:\Project\F\FirstEnergy\60483585 Yager Substation Tap\Data-Tech\GIS\Figure 1_FirstEnergyYagerTap_OverviewMap.mxd

Date Saved: 1/15/2016 Document Path: J:\Project\F\FirstEnergy\60483585 Yager Substation Tap\Data-Tech\GIS\Figure 2_NationalWetlandInventory&SoilMapUnitMap2.mxd



LEGEND

- Project Survey Boundary
- Soil Map Unit
- NWI Wetland

N

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online, USA Topo Maps

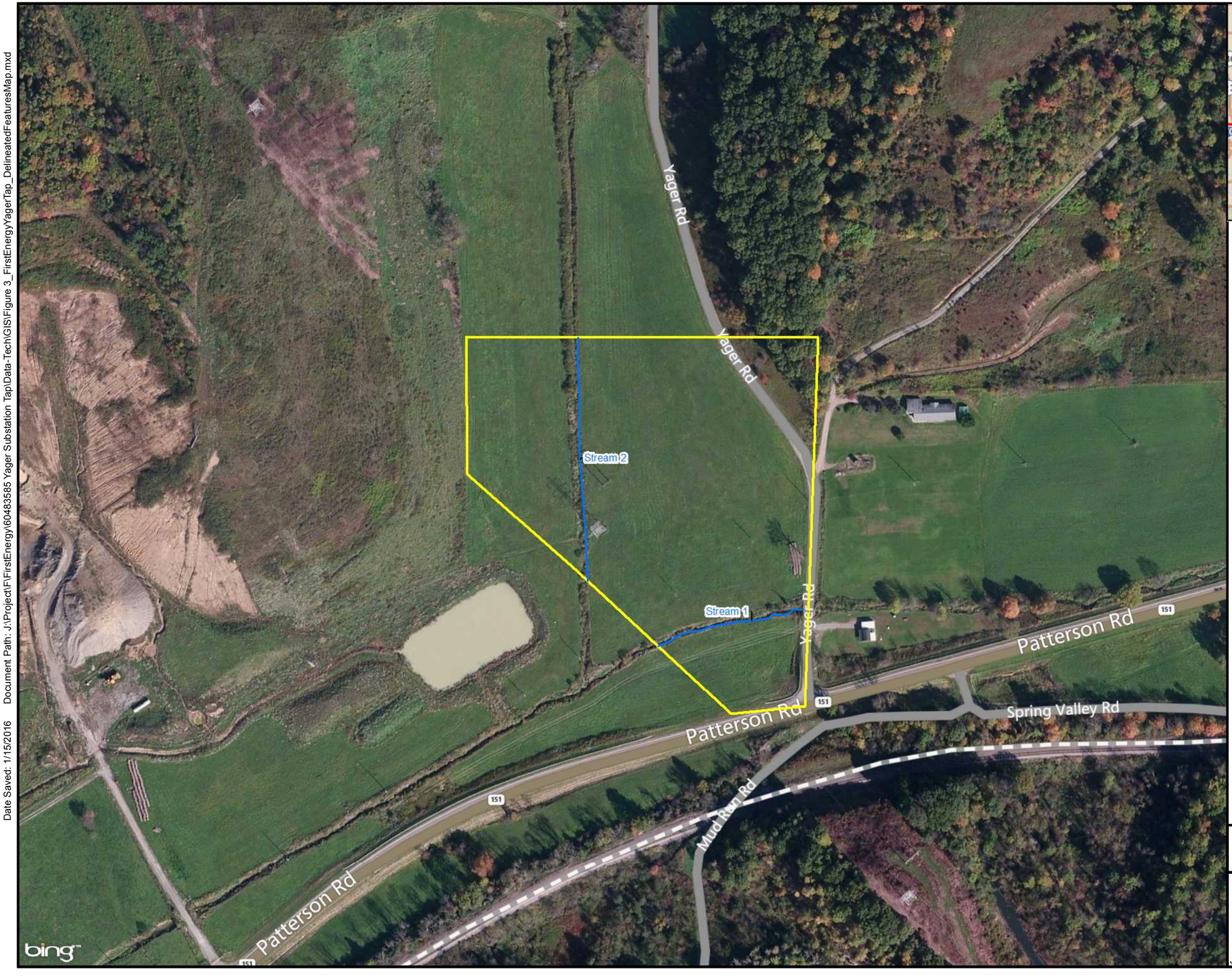
Yager Substation 138 kV
Transmission Line Loop Project

FIGURE 2
SOIL MAP UNIT AND
NATIONAL WETLAND INVENTORY MAP

JOB NO. 60483585

AECOM

Date Saved: 1/15/2016 Document Path: J:\Project\F\FirstEnergy\60483585 Yager Substation Tap\Data-Tech\GIS\Figure 3_FirstEnergyYagerTap_DelineatedFeaturesMap.mxd



LEGEND

- Project Survey Boundary
- Delineated Stream

N

0 200 400

Scale in Feet

BASE MAP SOURCE:
ArcGIS Online, USA Topo Maps

Yager Substation 138 kV
Transmission Line Loop Project

FIGURE 3
DELINEATED FEATURES MAP

JOB NO. 60483585

AECOM

APPENDIX A

OEPA QHEI STREAM FORMS

Fair Warmwater QH-BAE-120415-01

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 44

Stream & Location: QH-BAE-120415-01, First Energy Yazer Tapp **RM:** ___.__ **Date:** 12/04/15 06

Scorers Full Name & Affiliation: Betsy Ewsedt / Brian Peterson Aecom

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 40.403818 / 81.23372 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]		10	☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	20	30	☒ ☐ SILT [2]	40	30
☒ ☐ SAND [6]	40	30	☐ ☐ 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 5 (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.

- 1 UNDERCUT BANKS [1]
- 1 OVERHANGING VEGETATION [1]
- ___ SHALLOWS (IN SLOW WATER) [1]
- 1 ROOTMATS [1]
- ___ POOLS > 70cm [2]
- ___ ROOTWADS [1]
- ___ BOULDERS [1]
- ___ OXBOWS, BACKWATERS [1]
- 1 AQUATIC MACROPHYTES [1]
- ___ LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☒ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover 11 (Maximum 20)

Comments

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]

Channel 13 (Maximum 20)

Comments

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.

Riparian 4 (Maximum 10)

Comments

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)

Pool / Current 5 (Maximum 12)

Comments

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]

Riffle / Run 2 (Maximum 8)

Comments

6] GRADIENT
(47 ft/mi)

DRAINAGE AREA
(1.36 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 40 %GLIDE: 10
%RUN: 10 %RIFFLE: 40

Gradient 4 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☒ OTHER

STAGE N/A

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☒ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☒ OTHER

200 ft

~~meters~~

CLARITY N/A

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

1st pass _____ cm

2nd _____ cm

C] REC

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

RH-BAE-120415-01

Reach is typical of stream, recreation inferred, stream flow regime appears to be perennial. Modifications include culverts, large aggregate bank stabilization and riparian clearing.

B] AESTHETIC

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

ION AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

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

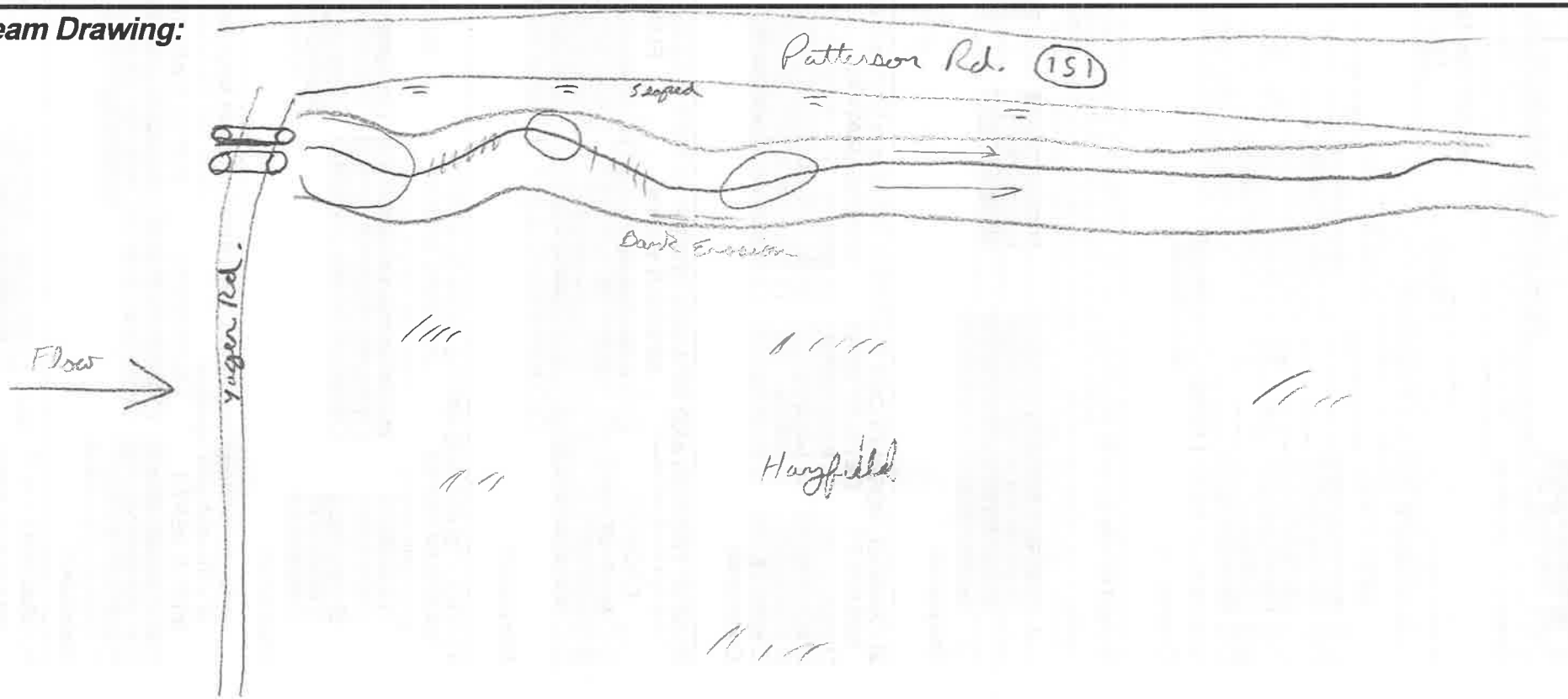
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / (EROSION) / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

x̄ width	
x̄ depth	
max. depth	18"
x̄ bankfull width	8'
bankfull x̄ depth	
W/D ratio	
bankfull max. depth	
floodprone x^2 width	
entrench. ratio	

Le *Tree:*

Stream Drawing:



Very Poor Warmwater QH-BAE-120415-02

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 28

Stream & Location: QH-BAE-120415-01, First Energy Yager Taps **RM:** ___.___ **Date:** 12/04/~~06~~ 15

Scorers Full Name & Affiliation: Betsy Ewoldt / AECOM

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 40.4057 / 81.2442 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]	10	
☐☐ BOULDER [9]			☐☐ DETRITUS [3]	10	
☐☐ COBBLE [8]			☐☐ MUCK [2]		
☐☐ GRAVEL [7]			☒☒ SILT [2]	80	
☐☐ 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	QUALITY
☐ LIMESTONE [1]	☒ HEAVY [-2]
☒ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]	☒ MODERATE [-1]
☐ LACUSTURINE [0]	☐ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT -2 EMBEDDEDNESS -1

Comments: Perennial 1 4 1 -3

Substrate 2 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]
2 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
1 SHALLOWS (IN SLOW WATER) [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: 2 7

Cover 9 Maximum 20

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: 1 1 3 1

Channel 6 Maximum 20

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)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]
☒☒ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☒☒ RESIDENTIAL, PARK, NEW FIELD [1]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]
	☒☒ NONE [0]	☐☐ 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: 2 0 1

Riparian 3 Maximum 10

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: 2 1 1

Pool / Current 4 Maximum 12

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 0 Maximum 8

6] GRADIENT (60 ft/mi)

DRAINAGE AREA (1.0 mi²)

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 0 %GLIDE: 0
%RUN: 100 %RIFFLE: 0

Gradient 4 Maximum 10

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	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

C] REC

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed (Inferred), *Other/* Sampling observations, Concerns, Access directions, etc.

Perennial flow regime (NHD verified)

B] AESTHETIC

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

ION POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

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

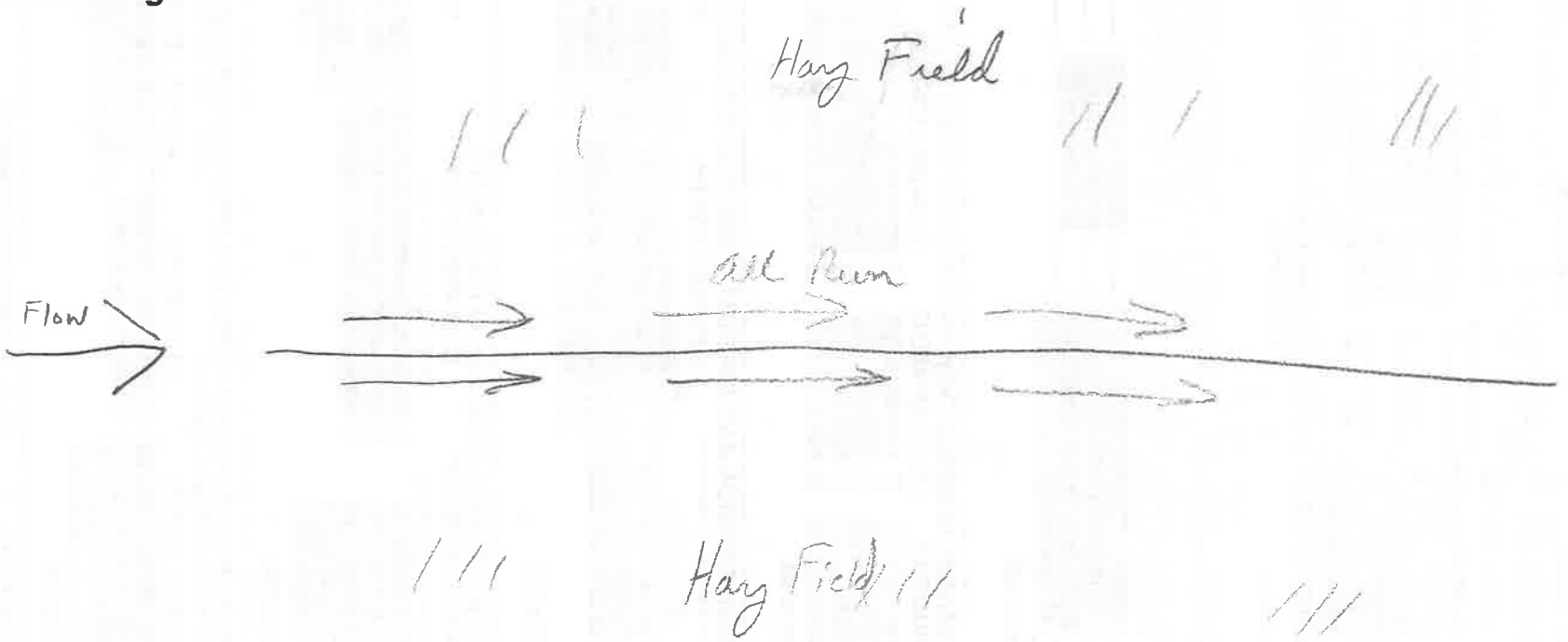
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth 16"
- $\bar{x}$ bankfull width 4'
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Le *Tree:*

Stream Drawing:



APPENDIX B

DELINEATED STREAM PHOTOGRAPHS

AECOM

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
American Transmission Systems, Inc.	Yager Substation 138 kV Transmission Line Loop Project	60483585

Photo No. 1

Date:

December 4, 2015

Description:

Stream 1

QHEI Stream

Facing downstream

Perennial stream

Photo No. 2

Date:

December 4, 2015

Description:

Stream 2

QHEI Stream

Facing downstream

Perennial stream