Beaver-Wellington 138kV Transmission Line Project

Application to the Ohio Power Siting Board for a Certificate of Environmental Compatibility and Public Need

Prepared for

American Transmission Systems, Incorporated, a FirstEnergy Company

OPSB Case Number 20-0004-EL-BTX

December 2020

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

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Acronyms and Abbreviations

ATSI	American Transmission Systems, Incorporated
BMP	best management practice
CAIDI	Customer Average Interruption Duration
DOW	Division of Wildlife
ELF	extremely low frequency
EMF	electric and magnetic field
EPRI	Electric Power Research Institute
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
Field Survey Area	133 feet on either side of the centerline for both the Preferred and Alternate Routes
FirstEnergy	FirstEnergy Corp.
GIS	geographic information system
HHEI	Headwater Habitat Evaluation Index
I-	Interstate
ID	identification
kV	kilovolt
MRI	Multiple Resource Area
MSDS	Material Safety Data Sheet
MW	megawatts
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHL	National Historic Landmark
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
OAI	Ohio Archaeological Inventory
OATT	Open Access Transmission Tariff
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OGS	Ohio Genealogical Society
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
OPGW	Optical Ground Wire
OPSB	Ohio Power Siting Board
ORAM	Ohio Rapid Assessment Method
OSHA	Occupational Safety and Health Administration
PEM	palustrine emergent
PFO	palustrine forested

PHWH	Primary Headwater Habitat
Project	Beaver-Wellington 138 kV Transmission Line Project
PSS	palustrine scrub/shrub
PUCO	Public Utilities Commission of Ohio
QHEI	Qualitative Habitat Evaluation Index
RAPID	Research and Public Information Dissemination
RF	ReliabilityFirst Corporation
RFI	Radio frequency interference
ROW	right-of-way
RSS	Route Selection Study
RTEP	Regional Transmission Expansion Plan
RTO	regional transmission organization
SADI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SDS	Safety Data Sheet
SR	Ohio State Route
SWPPP	stormwater pollution prevention plan
TO	Transmission Owner
TVI	television interference
UNT	unnamed tributary
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

4906-5-02 PROJECT SUMMARY AND APPLICANT INFORMATION

(A) PROJECT SUMMARY

American Transmission Systems, Incorporated ("ATSI"), a FirstEnergy company, plans to construct an approximately 27-mile 138-kilovolt (kV) transmission line that will extend from the existing Beaver Substation located in the City of Lorain, Lorain County, Ohio, to the existing Wellington Substation, located in Wellington Township, Lorain County, Ohio. The proposed Beaver-Wellington 138 kV Transmission Line (Project) consists of three primary components; expanding the existing Wellington Substation to facilitate installation of new equipment; constructing an approximately 1-mile-long section (known as the Brownhelm Section) and 6-mile long section (known as the Wellington Section) of new 138 kV transmission line; and reconfiguring (un-six wire) the existing 138 kV transmission line to create approximately 20 miles of new 138 kV transmission line. Figure 2-1 provides a general overview of the entire Project Area.

Although the total project consists of the approximately 27-mile 138 kV transmission line, this Application deals primarily with the construction of the new Brownhelm Section of the transmission line, construction of the new Wellington Section of the transmission line, and the expansion of the existing Wellington Substation. Reconfiguring the remainder of the approximately 20-mile existing 138 kV transmission line will not require the expansion of existing right-of-way (ROW), will not require the upgrade of conductor size, and will not have any environmental or land use impacts. Further, the portion of the transmission line that requires reconfiguring of the existing transmission line will not require any additional access rights. Since construction activities in this area will only involve reconfiguring the existing transmission line using existing access rights, this area was not included in the route alternative analysis.

(1) General Purpose of the Facility

The purpose of the proposed Project is to provide a second 138 kV source to the Wellington Substation. The second transmission source is needed to enhance the reliability, resiliency, efficiency, and operational flexibility of the transmission system in the Wellington, Carlisle, Homer, and Seville areas. Construction of the Project will directly improve electric service for approximately 27,900 customers served by the transmission system in the Project Area and provide additional capacity for economic development and load growth in the area. 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

(a) Brownhelm Section

The proposed Brownhelm Section begins approximately 2.4 miles west of Amherst, Ohio, at ATSI's existing Structure 1112 on the existing 138 kV transmission line, located approximately 0.5 mile east of the intersection of Rice Road and North Ridge Road. The proposed Brownhelm Section terminates at ATSI's existing Structure 8888 on the existing 138 kV transmission line, located approximately 0.2 miles southeast of the intersection of Rice Road and Heritage Way. The section is approximately 1.2 to 1.3 miles in length, depending on the route selected, and will be constructed using primarily wood and steel single-pole structures requiring an approximately 65-foot-wide permanent ROW. No additional ROW would need to be secured. Figure 2-2 shows the Brownhelm Section, existing ATSI electric transmission lines, and the Preferred and Alternate Routes proposed by ATSI.

(b) Wellington Section

The proposed Wellington Section begins at ATSI's existing Brookside-Henrietta 138 kV Transmission Line, which runs north to south approximately 0.2 mile west of Quarry Road. The proposed Wellington Section terminates approximately 1.9 miles southeast of Wellington, Ohio, at the existing Wellington Substation, located in the northwest corner of the intersection of Jones Road and Hawley Road. The section is approximately 4.2 to 6.0 miles in length depending on the route selected and will be constructed using wood single- and two-pole structures and steel single-pole structures requiring an approximately 65 to 100-foot-wide permanent ROW. The Preferred Route would require the expansion of the existing 50-foot ROW to 65 feet for the entirety of the northern/western side of the existing route and 100 feet where two-pole angled structures will be utilized rather than single-pole structures. Figure 2-3 shows the Wellington Section, existing ATSI electric transmission lines, and the Preferred and Alternate Routes proposed by ATSI.

(c) Wellington Substation Expansion

The proposed Wellington Substation is located approximately 1.9 miles southeast of Wellington, Ohio, in the northwest corner of the intersection of Jones Road and Hawley Road. An approximately 0.96-acre expansion to the existing site is required and will occur on the north and west sides of the existing substation site, requiring the relocation of one to two spans of the existing Wellington (Brookside) 138 kV Transmission Line. Figure 2-4 shows the existing Wellington Substation and proposed expansion area. Drawings of the substation expansion are provided in Appendix 5-1.

(3) Suitability of Preferred and Alternate Routes

ATSI identified Preferred and Alternate Routes after conducting a Route Selection Study (RSS) for both the Brownhelm Section and Wellington Section, which are included in Appendix 4-1. The RSS's provide details on the selection process utilized by ATSI and its siting team to identify the Preferred and Alternate Routes proposed in this Application. A detailed discussion of the RSS's and selected routes are found in Section 4906-5-04 of this Application.

The RSS process is an iterative and incremental process that starts with the identification of feasible routes given the Project need and the physical site setting. Potential routes for review and consideration were initially selected based on the avoidance or minimization of impacts to known sensitive land uses, ecological features, and cultural resources, where identification was possible from existing sources. Potential routes were then evaluated, compared, and ranked to narrow down the most viable routes for further evaluation. Ten candidate alternative routes were identified and subjected to a numerical scoring system for further evaluation on both the Brownhelm Section and Wellington Section. The candidate route scores were then ranked by individual category (i.e., land use, ecological, technical, and cultural) and the overall, combined score.

For purposes of identifying the Preferred and Alternate Routes presented in this Application, the siting team considered all of the factors as detailed in the RSS reports, with a particular emphasis on route alternatives that minimized residential impacts and paralleled existing transmission line infrastructure. Landowner comments were also considered and incorporated, where possible, to further reduce impacts.

Ultimately, the RSS process identified the Preferred and Alternate Routes for the Brownhelm Section and Wellington Section which represent, in ATSI's opinion, the minimum adverse environmental and socio-economic impacts considering all relevant factors.

(a) Preferred Route

(i) Brownhelm Section

The Preferred Route, which spans from ATSI's Structure 1112 to Structure 8888 on the existing Beaver-Henrietta 138 kV Transmission Line, is approximately 1.2 miles in length.

The 1.2-mile route begins at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112) and runs south for approximately 0.77 mile on the west side of ATSI's existing double circuit 138/345 kV transmission line, crossing Rice Road and Quarry Creek. The route then runs east for approximately 0.27 mile on the same structures as ATSI's existing Charlisle-Shinrock 138 kV Transmission Line (this section of line will be double-circuit), crossing under ATSI's existing double circuit 138/345 kV transmission line and single circuit 345 kV transmission line and crossing back over Quarry Creek. The route then runs south for approximately 0.12 mile, terminating at ATSI's existing Structure 8888.

(ii) Wellington Section

The Preferred Route spans from the existing Brookside-Henrietta 138 kV Transmission Line to the existing Wellington Substation and is approximately 6.0 miles in length.

The 6.0-mile route begins at the interconnecting point along the existing Brookside-Henrietta 138 kV Transmission Line and runs east for approximately 1.95 miles through rural agricultural landscapes. The route then runs northeast for approximately 1.45 miles, then runs east for approximately 1.93 miles crossing over South Ashland-Oberlin Road (Ohio State Route 58 [SR-58]) through predominantly agricultural landscapes until it reaches Hawley Road. The route then runs north paralleling Hawley Road for approximately 0.56 mile, then runs west paralleling Jones Road for approximately 0.07 mile before turning north, crossing Jones Road and terminating at the existing Wellington Substation.

(b) Alternate Route

(i) Brownhelm Section

The Alternate Route, which spans from ATSI's Structure 1112 to Structure 8888 on the existing Beaver-Henrietta 138 kV Transmission Line, is approximately 1.3 miles in length.

The 1.3-mile route begins at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112) and runs south then east for approximately 0.26 mile. The route then runs south for approximately 0.72 mile through forest and an agricultural field, paralleling the east side of ATSI's existing double-circuit 138 kV transmission line. On the north side of Rice Road, the route runs east for 0.06 mile, then runs south for approximately 0.07 mile, crossing over Rice Road and through a vacant parcel, before running southwest through agricultural land for approximately 0.1 mile. The route then runs south for approximately 0.06 mile, terminating at ATSI's existing Structure 8888.

(ii) Wellington Section

The Alternate Route from the existing Brookside-Henrietta 138 kV Transmission Line to the existing Wellington Substation is approximately 4.2 miles in length.

The 4.2-mile route begins at the interconnecting point along the existing Brookside-Henrietta 138 kV Transmission Line and runs southeast for approximately 2.28 miles through mostly rural and agricultural landscape, paralleling the existing Brookside-Wellington 138 kV Transmission Line and crossing over Quarry Road, Pitts Road, and railroad tracks. The route then turns east near the Upground Reservoir and runs east for approximately 0.98 mile, passing between two residential communities, crossing over South Main Street, and running through agricultural lands. The Preferred Route then runs southeast for approximately 0.47 mile, paralleling the Wheeling and Lake Erie Railroad Company railroad before running east along Jones Road for approximately 0.46 mile and terminating at the existing Wellington Substation.

(4) Schedule

Construction of the Project is anticipated to begin in January 2022 with an anticipated in-service date of June 2022. The current Project schedule, including all major activities and milestones, is illustrated in a Gantt schedule bar chart provided in 4906-5-03(F)(1).

(B) APPLICANT DESCRIPTION

(1) Company History

ATSI's assets are comprised, in large part, of the transmission assets formerly owned by the operating utilities of FirstEnergy in western Pennsylvania and Ohio (i.e., Pennsylvania Power Company in western Pennsylvania, and Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company in Ohio). ATSI commenced the provision of Federal Energy Regulatory Commission (FERC) jurisdictional interstate transmission service in Ohio on September 1, 2000, following approval from the Public Utilities Commission of Ohio (PUCO) to transfer transmission assets from the FirstEnergy Ohio operating companies to ATSI.

FirstEnergy was formed in 1997 through the merger of Ohio Edison Company and Centerior Energy Corporation. Through this merger, FirstEnergy became the holding company for Ohio Edison and its Pennsylvania Power Company subsidiary, as well as The Cleveland Electric Illuminating Company and The Toledo Edison Company. At that time, FirstEnergy served 2.2 million customers within 13,200 square miles of northern and central Ohio and western Pennsylvania and had approximately 12,000 megawatts of generating capacity.

In 2001, FirstEnergy nearly doubled its customers to more than 4.3 million when it merged with the former GPU, Inc., based in Morristown, New Jersey. GPU served 2.1 million customers in a 24,000 square-mile service area in Pennsylvania and New Jersey through its three operating companies: Metropolitan Edison Company, Pennsylvania Electric Company, and Jersey Central Power & Light Company.

In 2011, FirstEnergy completed a merger with Allegheny Energy, a Greensburg, Pennsylvania-based company that served 1.6 million customers in Pennsylvania, West Virginia, Maryland, and Virginia.

Today, FirstEnergy is one of the nation's largest investor-owned electric systems serving 6 million customers within a service territory of 65,000 square miles and six states.

(2) Current Operations and Affiliate Relationships

ATSI is a transmission-only company (a Transco) that provides transmission services in the western portion of Pennsylvania and in the State of Ohio. Currently, ATSI owns and maintains over 8,100 circuit-miles of transmission lines, substations, and other transmission facilities that are located primarily in the ATSI Zone of PJM Interconnection, LLC, which is the regional transmission organization (RTO) for the area. ATSI also owns certain limited transmission facilities outside of its zone that are necessary to tie ATSI's transmission system into the transmission and generation facilities in neighboring utilities' territories or otherwise necessary to support transmission service in ATSI's zone. ATSI's transmission facilities are under the operational control of PJM Interconnection, LLC.

4906-5-03 REVIEW OF NEED AND SCHEDULE

This Section of the Application provides an explanation of:

- why it is necessary to construct the proposed new 138 kV transmission line from the Beaver 138 kV Substation to the Wellington 138 kV Substation;
- how the Project fits into the Applicant's long-term forecast and regional plans for the electric system;
- how the Project serves the interest of system economy and reliability; and,
- provides a schedule for the Project

As explained in this Section of the Application, when compared to other alternatives, the proposed Project is the best option to enhance the reliability, resiliency, efficiency, and operational flexibility of the transmission system in the Wellington, Carlisle, Homer, and Seville areas. Construction of the Project will directly improve electric service for approximately 27,900 customers served by the transmission system in the Project Area and provide additional capacity for economic development and load growth in the area.

Construction of a new 138 kV transmission line was selected over other alternatives because it is the most effective solution to address the load and customers at risk for certain contingency situations while also providing additional capacity.

The Carlisle-Wellington 69 kV Line serves a significant number of customers and has two 138/69 kV sources, the Wellington 138/69 kV Substation and the Carlisle 138/69 kV Substation. The Wellington 138 kV Substation is served radially from one 138 kV source: the Brookside-Wellington 138 kV Transmission Line. An open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by a Brookside 138 kV bus fault or stuck breaker would result in a potential local voltage collapse on the Carlisle-Wellington 69 kV Line resulting in an outage to approximately 13,800 customers and 57 megawatts (MW) of load (see Figure 3-1).

Similarly, there are three 69 kV Lines that serve a significant number of customers:

- Homer-Wellington 69 kV Line
- Homer-Seville 69 kV Line
- Seville-Star 69 kV Line

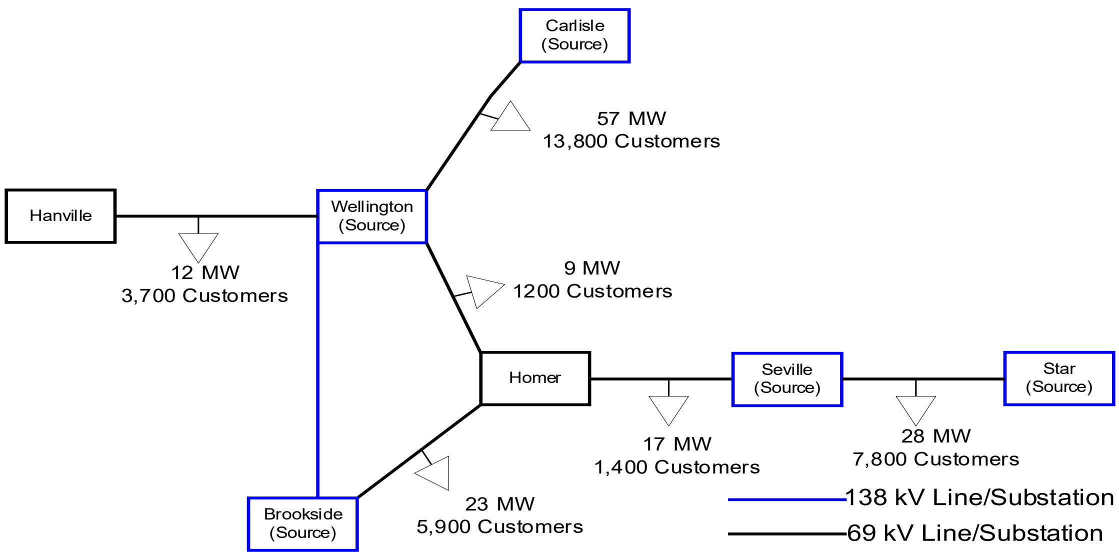
These lines have four 138/69 kV sources:

- Wellington 138/69 kV Substation
- Brookside 138/69 kV Substation
- Seville 138/69 kV Substation
- Star 138/69 kV Substation

Both the Wellington 138 kV Substation and the Seville 138 kV Substation have only one 138/69 kV transformer. The outage of the Brookside 138 kV bus followed by the loss of the Seville 138/69 kV transformer would result in a thermal overload on the Seville-Star 69 kV Line resulting in approximately 7,800 customers and 28 MW of load being at risk (see Figure 3-2).

Additionally, an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer would result in a thermal overload of the Homer-Wellington 69 kV Line and low voltage conditions on the Carlisle-Wellington 69 kV Line resulting in approximately 7,400 customers and 33 MW of load being at risk (see Figure 3-3).

Figure 3-1. An Open 69 kV Breaker at Carlisle on the Carlisle-Wellington 69 kV Line Followed by a Brookside 138 kV Bus Outage



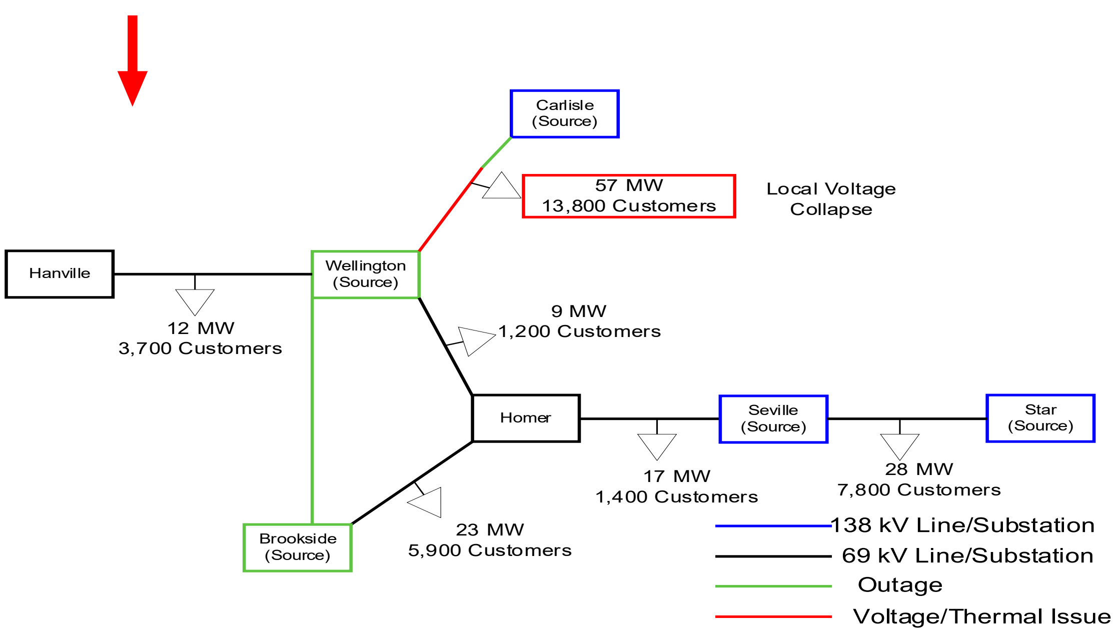


Figure 3-2. The Loss of the Brookside 138 kV Bus Followed by the Loss of the Seville 138/69 kV Transformer

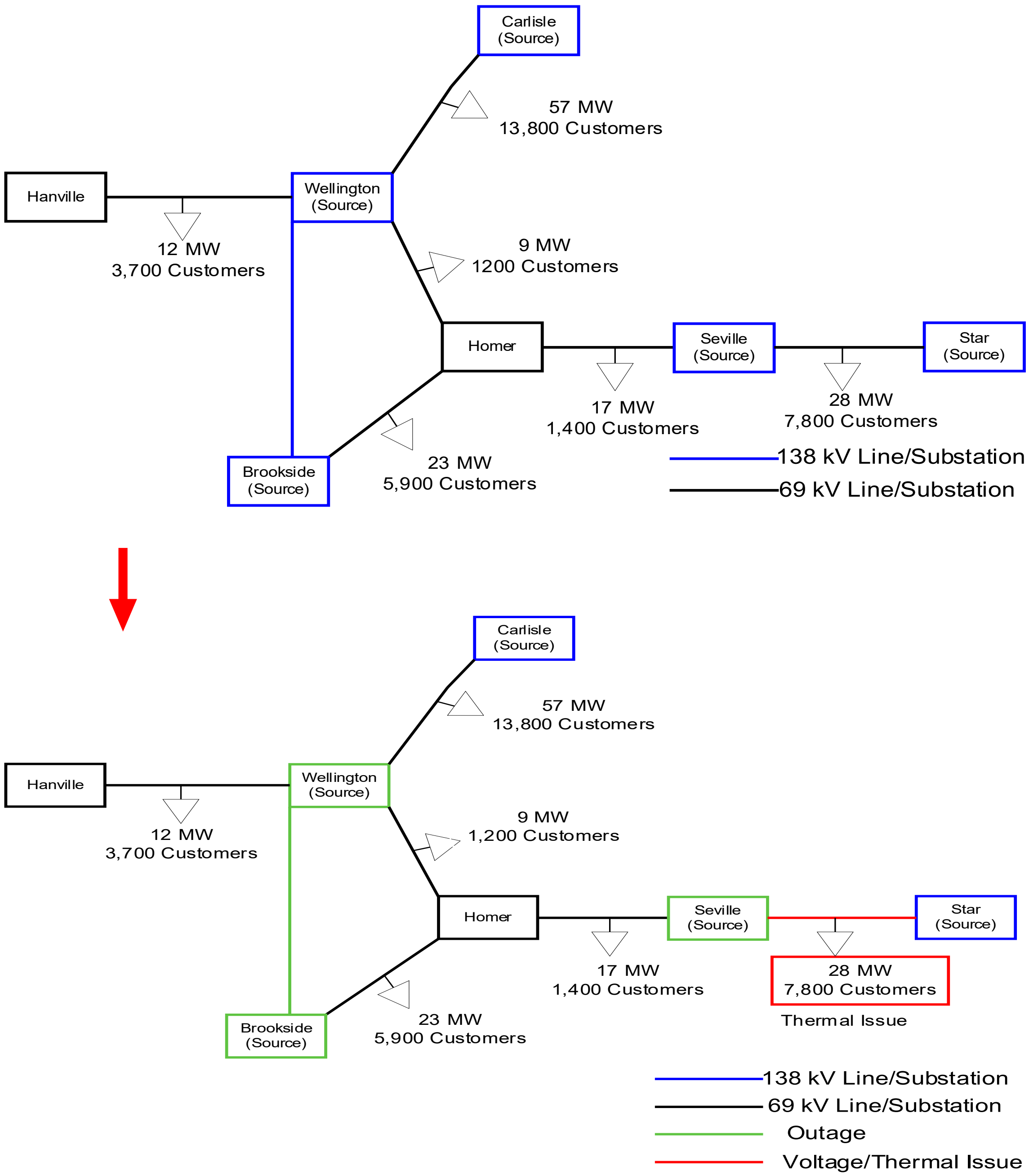
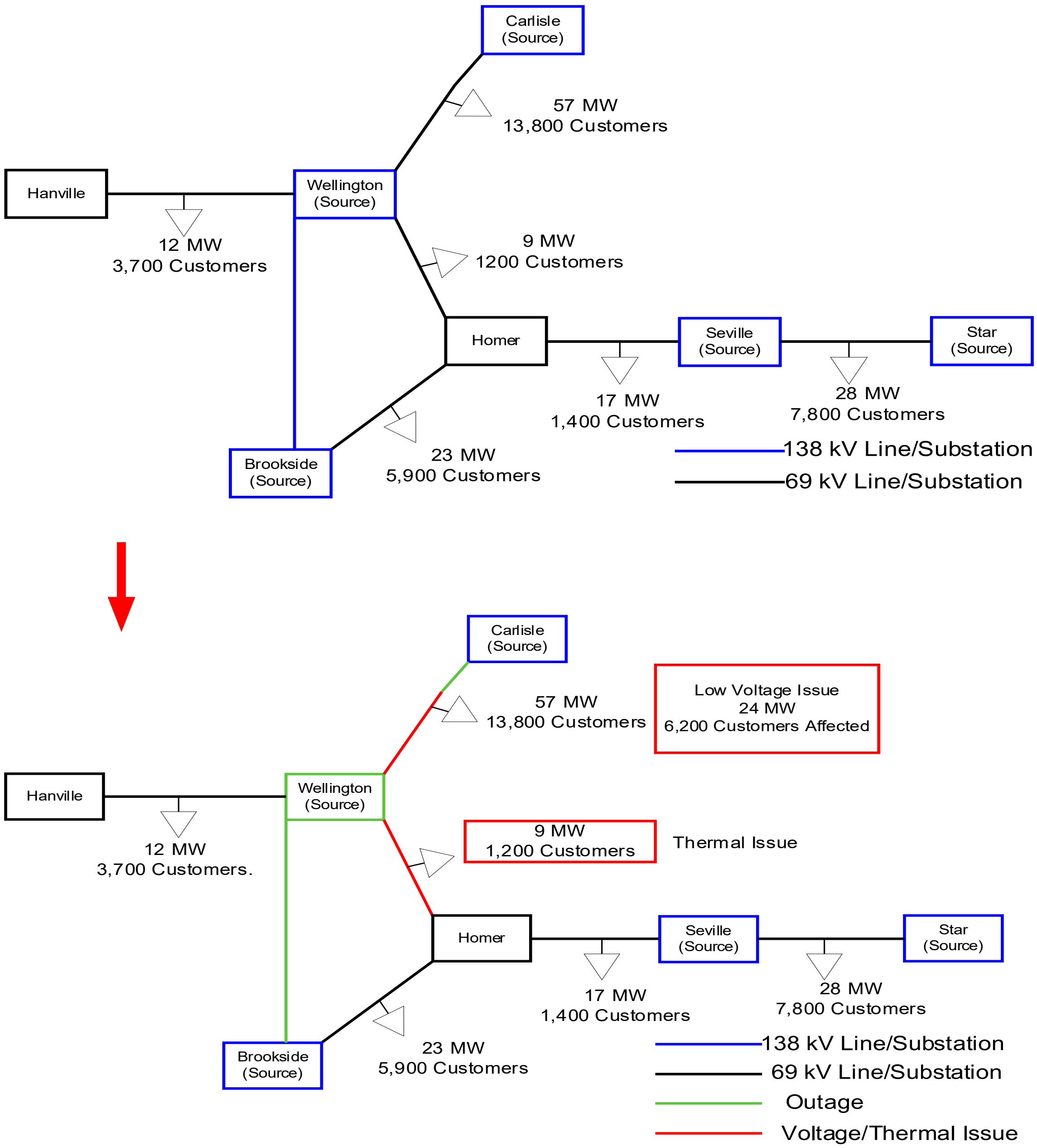
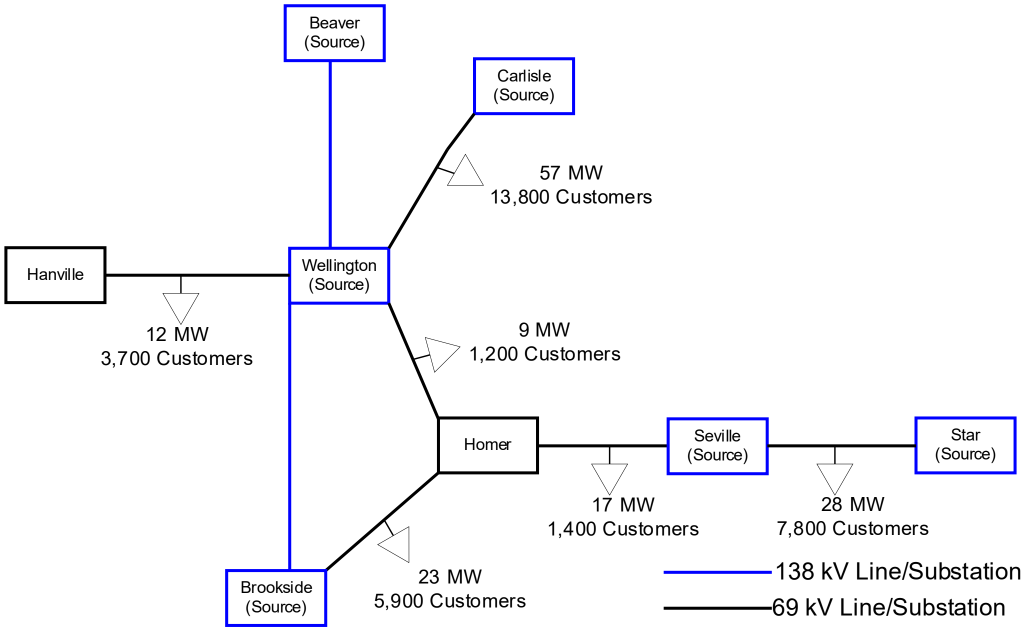


Figure 3-3. An Open 69 kV Breaker at Carlisle on the Carlisle-Wellington 69 kV Line Followed by the Loss of the Wellington 138-69 kV Transformer



By constructing a new 138 kV line between the Beaver Substation and the Wellington Substation, a second 138 kV source will be provided to the Wellington Substation. In addition, a second 138/69 kV transformer will be installed at the Wellington Substation. This Project will increase the reliability, resiliency, and operational flexibility to the area (see Figure 3-4).

Figure 3-4. Beaver-Wellington 138 kV Line



(A) NEED FOR PROPOSED FACILITY

This Project involves making improvements to the reliability and operational flexibility of the transmission system in the Project Study Area to strengthen the transmission system under certain planning contingencies and to increase the resiliency and efficiency of the operation of the transmission system in the Wellington, Carlisle, Homer, and Seville areas.

The Project consists of three components of planned upgrades necessary to achieve the system improvements. These three components are:

1. Convert the existing Wellington Substation into a four-breaker ring bus configuration and install a second 138/69 kV transformer.
2. Construct an approximately 1-mile long section (known as the Brownhelm Section) and a 6-mile long section (known as the Wellington Section) of new 138 kV transmission line.
3. Reconfigure (un-six-wire) an existing 138 kV transmission line to create room for the new 138 kV transmission line.

Implementation of these three upgrades is necessary to fully address the system reinforcements needed to achieve the system improvements. More specifically, the Project is needed to reinforce the 69 kV and 138 kV Transmission System in the Project Study Area to continue to provide safe and reliable electric service and to provide capacity for economic development and load growth in the area.

The Project Study Area was originally evaluated in 2015 using a current model of the transmission system and has since been re-evaluated in 2020 using the PJM 2019 RTEP power flow case that incorporates the most recent system configuration changes and an updated load forecast for the year 2024. In both evaluations the Project Study Area continued to be subject to potential loss of load under certain contingency situations (see Table 3-2 for specific contingency definitions).

(1) Purpose of the Proposed Facility

ATSI's 138 kV transmission system in and near the Project Study Area is part of the regional transmission grid, and through the Wellington, Carlisle, Seville, and Star 138 kV Substations, provides electric service to customers from the 69 kV system in the Wellington, Carlisle, Seville, Homer, and surrounding areas. This area of the FirstEnergy service territory is referenced in this Application as the Project Study Area.

Various planning scenarios for the 2024-year case could result in the interruption of electric service to a significant number of customers in the Project Study Area. With an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Brookside 138 kV bus, which removes the 138 kV sources into Wellington and Brookside substations, the 69 kV customers served from the Carlisle-Wellington 69 kV Line are exposed to a potential local voltage collapse and service could be interrupted.

Similarly, the loss of the Brookside 138 kV bus followed by the loss of the Seville 138/69 kV transformer, removes the 138 kV sources into the Brookside Substation, Wellington Substation, and Seville Substation. After this contingency, the Seville-Star 69 kV Line experiences a thermal overload. Service may be interrupted to customers on the Seville-Star 69 kV Line to mitigate the overload condition.

Likewise, with an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer, which removes the 138 kV source into the Wellington area, the Homer-Wellington 69 kV Line will experience a thermal overload and service may be interrupted to mitigate the overload condition. Also, the customers served on the Carlisle-Wellington 69 kV Line will experience low voltage conditions.

The purpose of the proposed Project is to provide a second, independent 138 kV source and additional transformation into the 69 kV network at Wellington Substation that will mitigate the concerns outlined above, increasing the reliability and operational flexibility of the 138 kV and 69 kV systems in the area. The addition of the new 138 kV transmission line connection to the Wellington Substation will create a reliable networked source at Wellington Substation. The Wellington Substation will be served by both the Brookside-Wellington 138 kV Line and the Beaver-Wellington 138 kV Line. Additionally, the proposed Project will reinforce the 69 kV support in the Project Study Area by providing additional system capacity to enable economic development opportunities. When compared to other system reinforcement alternatives, the proposed Project is the best option to resolve these concerns while also providing for resiliency, operational flexibility, system capacity, and economic growth in the area.

Overall, the Project will provide the following benefits to the Project Area's transmission system and its customers. The Project will:

1. Address potential customer outages caused by an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by a Brookside 138 kV bus outage (approximately 13,800 customers affected).

2. Address potential customer outages caused by the loss of the Brookside 138 kV bus followed by the loss of the Seville 138-69 kV transformer (approximately 7,800 customers affected).

3. Address potential customer outages caused by an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer (approximately 7,400 customers affected).

4. Strengthen the Project Area transmission system to support future load growth in the Project Study Area.

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

The ATSI transmission system in the Project Area is supported by five 138/69 kV substations (Wellington, Carlisle, Seville, Brookside, and Star). The Wellington 138/69 kV Substation is radially served by one 138 kV line with one 138/69 kV transformer. The Carlisle 138/69 kV Substation and the Seville 138/69 kV Substation also only have one 138/69 kV transformer each. It has become imperative to build this Project to mitigate the possibility of a significant number of customers being interrupted who are served from these substations. Additionally, this Project provides support for economic development in the area.

(3) Power Flow Studies and Contingency Analyses

ATSI modeled various planning scenarios and studies of the Project Area's Transmission System using the PJM 2019 RTEP summer power flow peak conditions for model year 2024 with and without the proposed Project. These studies included evaluation of the effects of the specific contingencies the proposed Project addresses.

Table 3-1 below lists the applicable system load level evaluated in the power flow analysis.

Table 3-1. Model Load Level

Year	Load Level	Applicable System
2024	12,954 MW	ATSI

Power Flow Study Results

Table 3-2 provides a summary of the 2024 case evaluation of the MW interrupted before and after installation of the proposed Project.

- With an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by a Brookside 138 kV bus outage, the Carlisle-Wellington 69 kV Line experiences a potential local voltage collapse resulting in the interruption of 57 MW of load and approximately 13,800 customers.

- For the loss of the Brookside 138 kV bus followed by the loss of the Seville 138/69 kV transformer (or vice-versa), the Seville-Star 69 kV Line experiences a thermal overload issue resulting in the interruption of 28 MW of load and approximately 7,800 customers.

- For an open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer, the Carlisle-Wellington 69 kV Line experiences low voltage conditions and the Homer-Wellington 69 kV Line experiences a thermal overload which could result in the interruption of 33 MW of load and approximately 7,400 customers.

Table 3-2. 2024 Case Evaluation

Contingency	Monitored Facility	Before Project	After Project	Before Project MW at Risk	After Project MW at Risk
An open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by a Brookside 138 kV bus outage	Carlisle-Wellington 69 kV Line	Potential Voltage Collapse	>0.96 pu	57	0
The loss of the Brookside 138 kV bus followed by the loss of the Seville 138/69 kV transformer	Seville-Star 69 kV Line	112% Thermal Overload	<87%	28	0
An open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer	Carlisle-Wellington 69 kV Line	Low Voltage (<0.90 pu)	>0.96 pu	24	0
	Homer-Wellington 69 kV Line	108% Thermal Overload	<21%	9	0

Note: per unit (pu) in the table above is the expression of system voltage as a fraction of a defined base unit quantity (i.e. 69 kV).

If these three contingency scenarios were to take place with the existing transmission system configuration, there is a negative impact to the reliability metrics System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Customer

Average Interruption Duration (CAIDI). This negative impact is summarized in Table 3-3 below. This table assumes a 3-hour outage duration. This outage duration was determined based on historic off-hours outage restoration times necessary to assemble a crew, dispatch the crew to the scene, allow the crew time to determine the issue, and then perform switching to restore customers. The impact values provided are for the entire Ohio Edison region of FirstEnergy.

$$\mathrm{SAIDI} = \frac{\sum \text{Customer Minutes Interrupted}}{\sum \text{Customers Served}}$$

$$\mathrm{SAIFI} = \frac{\sum \text{Customer Interrupted}}{\sum \text{Customers Served}}$$

$$\mathrm{CAIDI} = \frac{\sum \text{Customer Minutes Interrupted}}{\sum \text{Customers Interrupted}}$$

Table 3-3. Impact to Reliability Metrics of Contingency under Current Conditions

Contingency	SAIDI Impact	SAIFI Impact	CAIDI Impact	System CAIDI Increase
An open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by a Brookside 138 kV bus outage	2.384	0.013	180	0.8
The loss of the Brookside 138 kV bus followed by the loss of the Seville 138/69 kV transformer	1.347	0.007	180	0.4
An open 69 kV breaker at Carlisle on the Carlisle-Wellington 69 kV Line followed by the loss of the Wellington 138/69 kV transformer	1.278	0.007	180	0.4

Power Flow Study

All models and associated files should be requested through PJM. This is due to the fact that the data in the power flow model and associated files is owned by PJM. ATSI only provides some of the data that goes into the model. All the other Transmission Owners (TOs) and stakeholders also provide input to the model and associated files. PJM assembles the data and creates the model and associated files. The model and the associated file are not owned or controlled by ATSI.

(4) System Performance Transcription Diagrams

ATSI does not create System Performance Transcription Diagrams. Therefore, no diagrams are provided for this Project.

(B) REGIONAL EXPANSION PLANS

The Project need was submitted as a Supplemental Project to the PJM Regional Transmission Expansion Plan (RTEP) at the Sub-Regional RTEP Committee on August 31, 2018, and the solution was presented September 28, 2018. See section (1) (c) below.

(1) Proposed Facility in Long-Term Forecast

(a) Reference in Recent Long-Term Forecast

The Project is included in the 2020 LTFR (20-0567-EL-FOR).

(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 need was submitted as a Supplemental Project to the PJM Regional Transmission Expansion Plan ("RTEP") at the Sub-Regional RTEP Committee on August 31, 2018, and the solution was presented September 28, 2018, to improve operational flexibility, reliability, and infrastructure resilience; reduce the amount of local load loss under contingency conditions; and mitigate non-planning criteria concerns on the <100 kV system. PJM evaluated the proposed Project and did not identify any FirstEnergy or PJM Planning Criteria violations caused by the Project. As such, there is no additional need for other network system upgrades as a result of the Project. PJM assigned the Project supplemental upgrade identification number s1711.

PJM Interconnection LLC ("PJM"), in its capacity as the regional Transmission Planning Coordinator, Transmission Planner and Transmission Operator, identifies the need and timing for mandatory transmission system upgrades as part of the reliability planning, economic planning, and interconnection planning process to preserve the reliability of the electricity grid that is under its operational control as the Regional Transmission Organization. The PJM planning process is an 18-month cycle starting in September of every calendar year. The process ultimately produces a PJM Board approved RTEP 18 months later (February). The RTEP identifies transmission system upgrades and enhancements to provide for the operational, economic, and reliability requirements of PJM. The RTEP consists of system upgrades produced from one or more of four planning processes: reliability planning; economic planning; interconnection planning; and local planning.

Baseline upgrades are identified as part of the reliability planning and economic planning analysis. The analysis consists of a comprehensive series of detailed studies that are designed to satisfy PJM's reliability planning criteria and those of the applicable transmission owners, including FirstEnergy's Transmission Planning Criteria, as well as the North American Electric Reliability Corporation (NERC) and ReliabilityFirst Corporation (RF) reliability standards. The transmission planning process and the baseline RTEP projects selected for construction under that process are required by the applicable reliability and planning criteria and, once approved by PJM, are mandatory. Transmission Owners are obligated to build these projects under Section 1.7 of

Schedule 6 of the PJM Operating Agreement. These projects are identified by PJM with an upgrade ID starting with the letter “b” followed by a four-digit number.

Supplemental upgrades are TO-initiated projects and are part of the local planning process. In accordance with Attachment M-3 of the PJM Open Access Transmission Tariff (OATT), FirstEnergy provides information regarding the criteria used to plan and identify Supplemental Projects at an Assumptions meeting. The process for developing Supplemental upgrades includes identification and review of system needs at a separate Needs meeting and provides an opportunity for stakeholders to comment. Next, there is a Solutions meeting where potential solutions and any considered alternatives are discussed. Stakeholders may then provide comments on the potential solutions.

FirstEnergy Supplemental upgrades are typically: (i) a request for electric service from new or existing customers; and/or, (ii) a project identified pursuant to FirstEnergy’s Energizing the Future methodology. This methodology and any identified projects are presented to PJM and the PJM stakeholders in accordance with the PJM OATT, Attachment M-3, as described above. ATSI Reliability Enhancement projects, such as the proposed Project, are presented at the PJM Sub-Regional RTEP–Western committee meetings that occur monthly. Supplemental upgrades that have been reviewed through the Attachment M-3 process are identified by PJM with an “s” followed by a four-digit number. Supplemental upgrades are not mandated or directed by PJM but are necessary in order to address planning functions not transferred to PJM (e.g., asset management, customer interconnections). These projects reflect the TOs’ obligation to provide reliable service in its local service territory and are grounded in Good Utility Practice.

In general, FirstEnergy’s reliability enhancement methodology is intended to: (i) proactively upgrade or replace transmission lines and substation components that present an increasing risk to reliability; (ii) modernize the Operating Companies’ transmission infrastructure by implementing technological advances to enhance reliability and promote increased efficiencies; (iii) increase or restore load serving capability; (iv) improve the resiliency of the existing transmission system to better withstand and recover from storms and unusual weather events such as extreme heat and cold; (v) address heightened concerns with cyber and physical security; (vi) improve customer reliability by installing new equipment with real-time monitoring capabilities to optimize maintenance intervals and reduce the likelihood of equipment failure; and (vii) better address our customers’ needs by reducing the duration and frequency of unscheduled outages. Reliability Enhancement projects, such as the proposed Project, are largely driven to meet customers’ increasing reliability demands.

This Project was reviewed in accordance with the PJM OATT, Attachment M-3, process, as described above, and presented at the PJM Sub-Regional RTEP–Western committee meeting on August 31, 2018 and September 28, 2018. The Project was assigned supplemental upgrade identification number s1711.

(2) Gas Pipeline Long-Term Forecast Reference

Gas Pipeline Information. Not applicable to this Project.

(C) SYSTEM ECONOMY AND RELIABILITY

Completion of the Project will resolve planning concerns for customers at risk in the Project Area's transmission system for the future year studied. ATSI has determined that bringing the Project online will not adversely impact any of ATSI's other existing transmission facilities, or the transmission facilities and equipment of neighboring utilities. Overall performance on the Project Area's transmission system will be improved significantly as a result of the construction of the Project.

The potential for service interruptions impacting significant numbers of customers will be mitigated, and the Project Area's transmission system will have additional margin or capacity to allow ATSI the ability to support economic growth and greater operational flexibility to continue to provide safe, efficient and reliable electricity to its customers. The Project will add an additional 138 kV source and 138/69 kV transformer to the Wellington 138 kV Substation, strengthening the transmission system that provides local service to residential, commercial, and industrial customers in the area. In addition, transmission system maintenance and switching procedures will be less complex with this new transmission line put in place, reducing overall exposure to long duration outages. Substation equipment and overhead transmission lines are inspected on a routine basis and have regular maintenance schedules to ensure proper reliability and reduce the chances of system outages.

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

Alternatives evaluated for this Project included:

The following alternative projects were evaluated for their potential to eliminate the need for the Proposed Project:

1. Reconductor Homer-Wellington 69 kV Transmission Line
2. Reconductor the Seville-Star 69 kV Transmission Line
3. Add a second 138/69 kV transformer at Seville Substation
4. Add a second 138/69 kV transformer at Wellington Substation
5. Add capacitor bank(s) at selected substations along the impacted transmission line
6. Build a new 138 kV transmission line from West Medina or Seville area to Wellington Substation

The alternatives listed in options one through five do not address the potential voltage collapse concerns identified. Option six has the same benefit as the proposed Project but will require new

ROW, land acquisition, and new line construction for the entire new transmission line length (at least 20 miles) versus the proposed Project, which only requires approximately a total of 7 miles of new transmission line to be constructed. Therefore, option six was deemed less desirable then the proposed Project, and therefore, was not selected.

ANALYSIS OF NON-TRANSMISSION ALTERNATIVES

ATSI does not build or own generation and can only plan for transmission. In 2001, the State of Ohio made a policy decision to deregulate electric utilities. Through this deregulation, the State of Ohio mandated that transmission and generation must remain in legally separate and independent companies. As such, ATSI does not build or own generation and can only plan for transmission.

Inclusion of Energy Efficiency and Demand Side Management in PJM Forecasting

PJM's Reliability Pricing Model and forecasts include Energy Efficiency and Demand Side Management resources. Consequently, the ability to address the need for the Project through additional Energy Efficiency or Demand Side Management projects is limited by the fact that existing Energy Efficiency and Demand Side Management resources are already included in the forecasts that were used in the modeling that demonstrated the need for the Project.

(E) FACILITY SELECTION RATIONALE

The Project, which installs a 138 kV transmission line from the Beaver 138 kV Substation to the Wellington 138 kV Substation, was selected because it is the most efficient, long-term solution to resolve the identified concerns that exist on the transmission system in the Project Study Area, while adding additional capacity on the system for economic development, load growth, and operational flexibility. Construction of the Project will provide operating flexibility and provides another source for power flow to and through the Project Study Area, affording greater flexibility and capacity for load growth and system maintenance and ensures the businesses, homes, and communities in the area will have ready access to safe and reliable energy for many years to come.

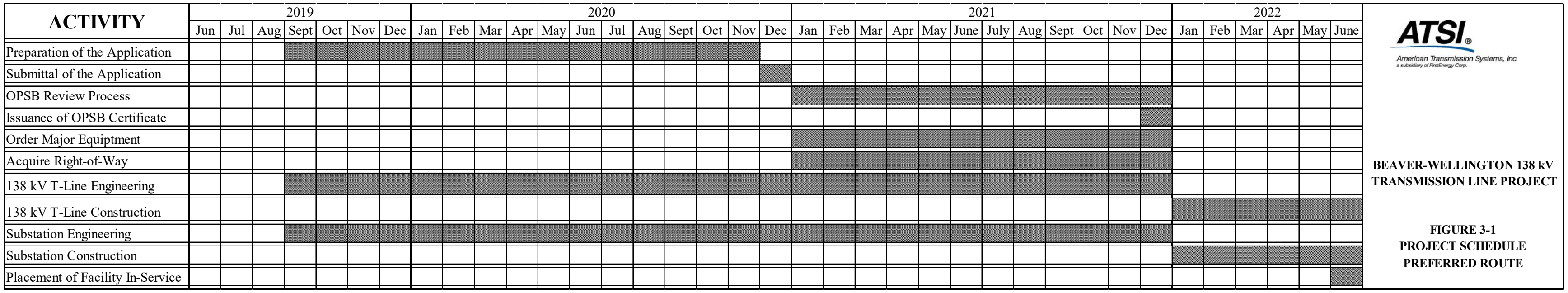
As noted herein, all the other transmission and non-transmission alternatives either would not resolve all of the concerns at a similar cost or, if such problems would be resolved, the alternatives would: (i) be short-term solutions; and (ii) require additional future investment to address the required overall necessary area improvements.

(F) PROJECT SCHEDULE

(1) Gantt Schedule Bar Chart

A detailed schedule for the proposed Project is presented in Figure 3-5.

Figure 3-5. Project Schedule



(2) Impact of Critical Delays

Critical delays in construction or other processes necessary to bring the Project online may impact the Applicant's electric customers in the Wellington, Carlisle, Homer, and Seville areas and surrounding area by exposing them to ongoing reliability issues until such time as the Project is completed. This may include lower than desired service voltages and emergency forced load-shed to prevent thermal loading issues. Project delays will also limit the ability to respond to and provide transmission service to economic development opportunities in an efficient and timely manner.

4906-5-04 ROUTE ALTERNATIVES ANALYSIS

(A) ROUTE SELECTION STUDY

ATSI and its siting team conducted an independent Route Selection Study ("RSS") for both the Brownhelm Section and Wellington Section of the Project. Copies of the RSS for each section of the Project are included in Appendix 4-1. The goal of each RSS was to identify feasible routes, while avoiding or minimizing effects on sensitive land uses, ecological, and cultural features in the Project vicinity with the ultimate objective being the identification of a Preferred and Alternate Route for the Project that meets all applicable criteria for issuance of a Certificate by the Ohio Power Siting Board (OPSB). Potential routes were quantitatively and qualitatively evaluated, compared, and ranked to provide the basis for the selection of a Preferred and an Alternate Route.

(1) Study Area Description and Rationale

(a) Brownhelm Section

The Project Area is located in northern Lorain County, which makes up the western edge of the Cleveland Metropolitan Area. The northern area of the county is primarily urban and suburban; in contrast, the southern area of the county has a more rural setting, with fewer high-density developments. The primary transportation corridors through the northern portion of the county are Interstate 90 (I-90), the Ohio Turnpike (I-80), U.S. Route 20, and SR-2.

Existing land uses surrounding the Project Area consist primarily of low-density suburban single-family residential. Several ATSI transmission lines run through the area as well. The general vicinity of the Project is near the intersection of Rice Road and Heritage Way. Along Heritage Way is a low-density suburban development with single-family homes on large (1 acre and larger) lots. Land uses gradually become more rural to the south and west of the area with a sustained development pattern of low-density single-family houses on large parcels. North and west of the area, the development pattern is suburban with higher density residential and commercial development closer to Lorain, Elyria, Amherst, and Avon.

Physical attributes in the Project Area include a terrain that is relatively flat, gradually sloping down toward Lake Erie with elevation ranging from 650 to 800 feet above sea level. There are active agricultural fields interspersed with housing developments, and woodlands are located sporadically through the Project Area, as well as a few streams. No major environmental features are in the Project Area beyond what would be expected in this landscape.

ATSI considered geographic features, such as existing utility corridors and higher density residential developments, as well as applying professional judgment, to define a focused study area. The delineation of the study area was driven by the identification of endpoints for the new electric transmission line. The southern endpoint for the new 138 kV transmission line is along ATSI's existing Beaver-Henrietta 138 kV Transmission Line north of I-80 and the northern endpoint is along ATSI's existing Beaver-Henrietta 138 kV Transmission Line approximately 1 mile north. It is a best practice to limit the study area in the opposite direction from the direct path between the endpoints.

(b) Wellington Section

The Project Area is located in southwest Lorain County, southwest of the Village of Wellington. The northern area of the county is primarily urban and suburban; in contrast, the southern area of the county has a more rural setting, with fewer high- and medium- density developments. The primary population centers in the southern area of the county include Oberlin, LaGrange, Rochester, and Wellington. The primary transportation corridors through the southern portion of the county are U.S. Route 20, SR-511, SR-58, and SR-18.

Physical attributes in the Project Area include terrain that is relatively flat, with gently rolling hills near rivers and streams with elevation ranging from 800 to 930 feet above sea level. There are active agricultural fields and large woodlots throughout the Project Area. A number of larger streams run through the area. Findley State Park, Wellington Reservation, and Wellington Reservoir Park, known as the Wellington Reservoirs, are three large natural areas in the Project Area. These areas provide opportunities for hiking, biking, strolling, fishing, boating, and wildlife observation within and just outside the Village of Wellington. No other major environmental features are in the Project Area beyond what would be expected in this landscape.

To define a focused study area, ATSI considered geographic features, such as higher density residential developments associated with the Village of Wellington and Findley State Park, as well as the team’s professional judgment. The delineation of the study area was also driven by the identification of endpoints for the new electric transmission line. The eastern endpoint for the new 138 kV transmission line is ATSI’s existing Wellington Substation, and the western endpoint is along ATSI’s existing Brookside-Henrietta 138 kV Transmission Line. It is a best practice to limit the study area in the opposite direction from the direct path between the endpoints.

(2) Study Area Map

Figure 2 in the attached RSS reports (Appendix 4-1) illustrates the approximate boundary of the study areas.

(3) Map of Study Area, Routes, and Sites Evaluated

Figures 7a and 7b in the attached RSS reports (Appendix 4-1) illustrate the approximate boundary of the study areas, study segments, and the alternative routes that were evaluated to guide the siting team in the selection of Preferred and Alternate Routes.

(4) Siting Criteria

The list and description of all quantitative siting criteria as well as the weighting values for each criterion utilized in the RSS are presented in Appendix E of the RSS reports (Appendix 4-1). The quantitative siting criteria consist of constraint and attribute data, including, but not limited to, locations of forested lands, wetlands, streams, cultural resources, individual residences, property boundaries, institutional land uses, existing transmission lines, and other land use features. These criteria were assigned weighting values based on the specific Project Area setting and primary land uses, and the professional judgment of the siting team, which allowed for the calculation of final route scores.

Sensitive areas identified in the Brownhelm Section RSS included residential parcels, cultural resources, and ecological resources. As the study area is primarily a rural setting, the number of residential structures are primarily located adjacent to existing roadways and sporadically located amongst agricultural land. The location of residential structures significantly limited the placement of route alternatives near the southern extent of the study area along Rice Road. Previously identified cultural resource sites were generally concentrated on the outer edge of the study area. Anticipated impacts to cultural resources did not significantly limit the placement of route alternatives. Ecologically sensitive areas include locales of streams, forest habitat, and minimal wetlands throughout the study area.

Sensitive areas identified in the Wellington Section RSS included residential parcels, cultural resources, and ecological resources. As the study area is mostly a rural setting except for the Village of Wellington, residential structures were primarily located along primary roadways and sporadically located amongst agricultural land. The location of residential structures significantly limited the placement of route alternatives along primary roadways throughout the study area and within the Village of Wellington in the northeast corner of the study area. Previously identified cultural resource sites were generally concentrated along South Main Street/South Ashland-Oberlin Road. Anticipated impacts to cultural resources limited the placement of route alternatives. Ecologically sensitive areas include specific locales of streams, two lakes associated with the Wellington Reservoir, and forest habitat throughout the study area. The location and size of the Wellington Reservoirs limited the placement of route alternatives in the middle of the study area.

(5) Siting Process for Preferred and Alternate Routes

After identifying the study area, constraint and opportunity data, and establishing the siting criteria, preliminary study segments were drawn based on the results of the map analysis, review of aerial photography, topographic maps, and the mapped attribute and constraint data in a raster-based suitability model. The intent when placing these study segments was to minimize impacts. Once the initial study segments were developed, geospatial algorithms were applied to determine the suitability scores of each study segment for review and comparison in order to develop a refined study segment network. Using the refined study segment network, ten alternative routes were developed.

Various siting criteria were quantified for each route and then each quantified value was normalized to assign each criterion a score. This makes the data easier to perform a relative comparison of the routes. Normalizing the data into a score is vital so that all of the constraints are directly compared according to the same scale. ATSI's siting team identified weighting factors for each siting criteria category (ecological, cultural resources, land use, and technical). The various RSS alternatives routes were then numerically scored to identify the overall top-ranked alternative routes.

In addition to quantitative scoring, ATSI's siting team, relying on its experience and familiarity with many transmission siting projects, further refined the routes based on several qualitative factors.

A combination of qualitative factors, route scoring, public input, and engineering design/ constructability were ultimately all used to determine the Preferred and Alternate Routes. The entire siting process, methodology, and results are described in detail in the RSS reports in Appendix 4-1.

(6) Route Descriptions and Rationale for Selection

(a) Brownhelm Section

The Preferred Route was identified as Route 8 in the RSS and is the top-ranked route based on quantitative factors. This route has fewer ecological impacts and fewer impacts to existing land use compared to other routes. This route is also located within ATSI's existing ROW and no additional ROW would need to be secured. This route also parallels existing transmission lines for the majority of the route.

The Alternate Route was identified as Route 10 in the RSS and is the second-ranked route based on quantitative factors. This route has more woodlots and wetlands within the ROW compared to the Preferred Route. This route also has one residence within 100 feet of centerline but fewer residences within 1,000 feet of centerline. This route parallels an existing transmission line for approximately 70 percent of the route.

(b) Wellington Section

The Preferred Route is identified as ATSI's existing Hanville-Wellington 69 kV alignment. The route was initially not part of the siting study but was added after feedback from landowners at the public information meeting (discussed below). This route would require rebuilding the existing single-circuit 69 kV structures to double circuit 69/138 kV structures. ATSI would need to acquire additional ROW to operate the transmission line within ATSI standards. This route is approximately 6.0 miles long, has less woodlots within the ROW, has no residences within 100 feet of the centerline and fewer residences within 1,000 feet of the centerline. Because ATSI would be rebuilding on the existing centerline, there would only be a minor visual impact as the structures would be slightly taller.

The Alternate Route is identified as Route 4 in the RSS. This route is approximately 4.2 miles long, which is the shortest route. This route has more woodlots within the ROW, two residences within 100 feet of the centerline, and more residences within 1,000 feet of the centerline because it runs through the southern part of the Village of Wellington. This route would be constructed as a single circuit 138 kV line paralleling ATSI's existing Brookside-Wellington 138 kV Transmission Line. This route does not require the acquisition of additional ROW; however, new structures will need to be installed, which would result in a visual impact because there would be two single-circuit transmission lines and structures located next to each other, as opposed to one structure using double-circuit construction.

(B) COMPARISON TABLE OF ROUTES, ROUTE SEGMENTS, AND SITE

Tables 3-1 through 4-2 in the Brownhelm Section RSS Report and Tables 3-3 through 4-2 in the Wellington Section RSS Report (Appendix 4-1) provide scoring and ranking results for the study segments and alternative routes. Tables 4-1 and 4-2 in both reports include the individual category scores (ecological, cultural resources, land use, and technical) for each alternative route and the corresponding relative rank of each.

(C) PUBLIC INVOLVEMENT

ATSI conducted a public information program to raise awareness, communicate project details, and seek feedback from residents and local elected officials. Part of the public engagement program involved conducting two public informational meetings (open house forum) in the area to seek feedback from the community on the Brownhelm Section and Wellington Section of the Project and the routes being considered as well as a virtual public information session to provide an update on the Project and seek additional feedback from the community. Prior to the public information meetings, ATSI mailed invitation letters to residents and tenants and published a newspaper public notice of the public information meeting. A project website was created with project mapping and a summary description. At the public information open houses, ATSI, Burns & McDonnell, Inc., and Jacobs Engineering Group Inc. representatives were available to answer questions, listen, and receive feedback from the public to incorporate in the siting process. For the virtual public information session, ATSI mailed letters to residents and tenants along the proposed Project to provide an update on the Project and inform them how they could view an online presentation regarding the project and communicate questions and concerns. The project website was also updated to include an interactive map where the public could identify their property in relation to the Project. A summary of the public informational meetings and virtual public information session are provided below.

(1) Public Informational Meeting

(a) Brownhelm Section

ATSI conducted the public informational meeting (open house forum) on January 7, 2020, at the Brownhelm Township Hall in Vermillion, Ohio. Two alternative routes were presented for public comment, along with other project information during the meeting. Detailed maps of the alternative routes were presented that included property boundaries with unique parcel identification (ID) numbers referenced to a list of property owners. This allowed attendees to identify their property on aerial photographs and observe the location of the proposed alignment with respect to their property. Approximately 32 people attended the public information meeting.

ATSI encouraged those attendees with specific objections to suggest alternatives. Twelve comment cards were received from attendees during the public informational meeting, and ten additional comments/letters, including one petition, have been received as of July 14, 2020. Comments included concerns about impacts on property value, impacts on the community, loss of trees, questions regarding the possibility of using existing transmission lines in the area (rebuild as double circuit), and preference for an alternative route. ATSI’s siting team reviewed each of the landowners' comments and fully considered the concerns and/or recommendations expressed to aid in the selection of the Preferred and Alternate Routes.

Following the public informational meeting, a minor adjustment was made to the Alternate Route to maximize paralleling existing transmission lines to minimize impacts to agricultural and forested fields.

(b) Wellington Section

ATSI conducted the public informational meeting (open house forum) on January 8, 2020, at Wellington High School in Wellington, Ohio. Two alternative routes were presented for public comment, along with other project information during the meeting. Detailed maps of the alternative routes were presented that included property boundaries with unique parcel ID numbers referenced to a list of property owners. This allowed attendees to identify their property on aerial photographs and observe the location of the proposed alignment with respect to their property. Approximately 28 people attended the public information meeting.

ATSI encouraged those attendees with specific objections to suggest alternatives. Fourteen comment cards were received from attendees during the public informational meeting, six additional comments/letters were received by email, and three additional comments were filed with the OPSB as of July 14, 2020. Comments included concerns about impacts on property value, electric and magnetic fields (EMF), impacts on farmland, impacts on wetlands and trees, and questions regarding the possibility of rebuilding the existing Hanville-Wellington 69 kV Transmission Line as a double circuit. ATSI's siting team reviewed each of the landowners' comments and fully considered the concerns and/or recommendations expressed to aid in the selection of the Preferred and Alternate Routes.

Following the public informational meeting, ATSI reviewed the existing Hanville-Wellington 69 kV Transmission Line and determined that it is scheduled for rebuild as a double circuit line with the existing 69 kV transmission line on one side and open arms for a future 138 kV transmission line on the other side. Based on this information, ATSI shifted the Preferred Route alignment to the existing Hanville-Wellington 69 kV Transmission Line alignment to use the open arms for the 138 kV circuit, reducing ecological and land use impacts as well as visual impacts in the area.

(2) Virtual Public Information Session

Due to delays in filing the Application following the initial public information meeting, ATSI was required to conduct a second public engagement process before filing the Application with the OPSB. Because of the ongoing COVID-19 pandemic and the restrictions on public meetings, ATSI conducted an additional public information meeting via a virtual open house forum (website) between July 15, 2020, and August 14, 2020. This alternative public engagement process was developed and conducted in lieu of an additional in-person public information meeting to maintain a safe environment for everyone involved while providing the community with the chance to gather information and provide feedback on the Project.

The alternative public engagement process focused on three main components. First, letters were provided to residents and tenants along the proposed Project with a basic overview of the Project and how it relates to their property. Second, ATSI prepared and posted to the Project website a presentation that explores many elements of the Project, including identification of the Preferred and Alternate Routes. Finally, ATSI provided several avenues for members of the community to communicate questions and concerns including scheduling an individual conference call with ATSI representatives to discuss the Project.

Four comments/questions were received during the virtual public informational session (July 15-August 14, 2020). Comments/questions included requests for additional materials to help identify individual properties in relation to the proposed Project, questions regarding ROW impacts and questions about upgrading transmission lines. ATSI reviewed each of the comments, responded to all questions, and fully considered the concerns and/or recommendations expressed regarding the Project and selection of the Preferred and Alternate Routes.

4906-5-05 PROJECT DESCRIPTION

(A) PROJECT AREA DESCRIPTION

The map provided in Section 4906-5-07 (Figure 7-1 and 7-2) includes a description of the Project Area's geography, topography, population centers, major industries, and landmarks.

(1) Project Area Map

Figures 7-1 and 7-2 provide maps at 1:24,000-scale, showing the Preferred and Alternate Routes for the Project sections. These maps include a 1,000-foot corridor on each side of the proposed transmission centerlines (hereafter referred to as the 2,000-foot corridor). These maps depict the proposed transmission lines, roads and railroads, major institutions, parks, and recreational areas that are publicly owned, existing gas pipeline and electric transmission line corridors, named lakes, reservoirs, streams, canals, and rivers, and population centers and legal boundaries of cities, villages, townships, and counties. The Brownhelm Section maps utilize the Vermilion East, Ohio, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle as a base map. The Wellington Section maps utilize the Sullivan, Nova, Wellington, and Brighton, Ohio, USGS 7.5-minute topographic quadrangles as base maps.

The information on the map was updated by reviewing digital, georeferenced aerial photography, property parcel data from the Lorain County Auditor's Office, and field reconnaissance trips conducted between September 2019 and February 2020. The aerial photographs are georeferenced, ortho-corrected color images derived from ESRI ArcGIS Online.

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

The proposed permanent ROW width for both the Brownhelm and Wellington Sections is 65 feet. Table 5-1 provides information about the Preferred and Alternate Routes ROW acreage, length, and properties crossed based on the proposed centerline for the Brownhelm and Wellington Sections.

Table 5-1. Right-of-way Area, Length, and Number of Properties Crossed for the Preferred and Alternate Routes

	Route Alternatives	
	Preferred	Alternate
Brownhelm Section		
Proposed ROW area (in acres)	9.3	10.1
Length (in miles)	1.2	1.3
Number of properties crossed (by ROW)	20	15
Wellington Section		
Proposed ROW area (in acres)	50.5	33.1
Length (in miles)	6.0	4.2
Number of properties crossed (by ROW)	29	35

(B) ROUTE OR SITE ALTERNATIVE FACILITY LAYOUT AND INSTALLATION

(1) Site Clearing, Construction, and Reclamation

The following paragraphs provide information on the proposed site clearing, construction methods, and reclamation operations for the Project.

(a) Surveying and Soil Testing

The transmission line will be surveyed to establish the centerline location. The surveying will be completed using conventional and/or aerial methods. The location of significant topographic features and human-made structures along or near the centerline of the transmission line that may affect the design of the transmission line will be identified during the survey. Some minimal clearing of small trees and brush may be required if the surveyor's line of sight is obstructed. Offsets will be used to survey around large trees and other large obstructions. Profile measurements will also be obtained by conventional or aerial methods. Structure locations will be staked prior to construction.

Soil and/or rock tests may be performed along portions of the final approved route if foundations for poles are necessary based on final engineering design. In those few locations where steel structures on concrete foundations may be necessary, geotechnical soil testing using truck-mounted drilling equipment may be utilized. Soil tests will be performed using a drop hammer to drive a sampler tube. Soil bearing capacity is tested by the number of blows required to drive the tube 12 inches into the ground. Soil samples taken with a split-spoon at 5-foot intervals will be used to determine soil type. Typically, the testing will be performed to a depth of between 20 to 40 feet. If rock is encountered, a carbide-tipped bit will be used to drill an exploratory boring 5 to 10 feet into the rock.

(b) Grading and Excavation

No significant grading is anticipated to construct the transmission line on either route. The existing terrain within the planned ROW for the Preferred and Alternate Routes generally provides a suitable surface for construction vehicle operation. Some minor local leveling may be necessary for designated laydown and set-up areas for construction equipment; however, any grading would be restricted to the immediate area.

Each wood pole installation requires a machine-drilled hole for placement of the structure. The excavation for these poles will be approximately 3 feet in diameter and 9 to 17 feet deep. A portion of the excavated soil will be used for backfill. The excess material will be placed around the structure or hauled offsite to an approved spoils disposal facility.

The installation of steel poles on concrete foundations may be needed at certain locations. These structures will require a machine-drilled hole for placement of the pole foundation. The excavation for each concrete foundation will be approximately 7 feet in diameter and approximately 25 feet deep. A portion of the excavated soil will be used for backfill around the foundation, and the excess soil material will be placed around the pole or hauled offsite to an appropriate spoils disposal site.

(c) Construction of Temporary and Permanent Access Roads and Trenches

Construction access will be required for the stringing of the conductor cable or wire and installation of the structures. Access roads will require landowner's input and approval. Preliminary access roads for the Preferred and Alternate Route will occur from existing public roads in close proximity to, or crossed by, the transmission line ROW.

Proposed access roads are identified in Figures 8-2A though Figure 8-2C and Figures 8-5A through Figure 8-5N. The location of these access roads cannot be finalized until after a route is approved and ATSI meets with affected landowners. Where access across wetlands or streams is necessary, construction matting or equivalent will be used to minimize disturbance. 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

Conductor installation for the proposed line will be accomplished using the tension stringing method. Lightweight guy cables or ropes will be fed through the stringing sheaves of the sections of line that require stringing. Conductors will then be pulled through under sufficient tension to keep the conductor off the ground. This protects the conductor from surface damage.

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 general 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

Generally, the Project will be constructed using direct embed wood poles. In some locations, steel poles may be needed. In these locations, a machine-drilled hole for placement of the pole's concrete foundation will be necessary.

(f) Post-Construction Reclamation

After construction is complete, the Project workspace will be restored to pre-construction conditions or better. This includes the restoration of drainage ditches; repair or replacement of any pre-existing or damaged fencing or field drainage tiles (or damage thereto); the seeding and mulching of disturbed non-cultivated areas; and the removal of temporary soil erosion and sedimentation control measures after vegetative cover has been established. Disturbed areas adjacent to streams and wetlands will be revegetated using methods to minimize soil erosion and degradation.

Lawn or garden areas or paved areas damaged during the construction of the transmission line will be restored to original condition. Landscaping or landscape plantings damaged during construction will also be restored to original condition or replaced to the extent possible and practical as requested by the affected property owner.

Temporary and permanent seeding will be coordinated with 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 restored and seeded with a suitable grass seed mixture that will be specified in the erosion and sediment control plan.

(2) Facility Layout

No new associated facilities, such as new substations, are proposed for the Project. The existing Wellington Substation is being expanded in conjunction with the Project.

(a) Transmission Line Route and Substation Expansion Map

Figures 8-2A through 8-2C, 8-3A through 8-3C, 8-5A through 8-5N, and 8-6A through 8-6I show maps at 1:6,000-scale of the Preferred and Alternate Routes for the Brownhelm Section and Wellington Section. These maps contain the data required by Ohio Administrative Code (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 final engineering design is complete, preliminary locations are provided for the Preferred Route, as illustrated in Figures 8-2A through 8-2C and 8-5A through 8-5N. The data and information defined in OAC 4906-5-05 (B)(2)(a) includes temporary access roads and proposed locations of transmission line poles and buildings.

The Project proposes to expand the existing Wellington Substation by an additional 0.96 acres to facilitate the installation of new equipment in the substation. This represents a 188 percent expansion of the substation. To accommodate the addition of this new expansion area, approximately 840 linear feet of additional fence will be installed. Drawings of the substation expansion are provided in Appendix 5-1.

ATSI 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, ATSI will provide those locations.

(b) Proposed Layout Rationale

A detailed description of the reasons for the proposed layout for the Brownhelm and Wellington Sections (i.e., the Preferred and Alternate Routes) are presented in the RSS reports (Appendix 4-1).

(c) Plans for Future Modifications

Except as otherwise described in this Application, ATSI currently has no specific plans for future modifications of the proposed Project.

(C) DESCRIPTION OF PROPOSED TRANSMISSION LINES OR PIPELINES

(1) Electric Power Transmission Lines

The majority of the Project will be installed using wood pole construction. Steel structures will be required at select locations. The exact number and location of these structures along the centerline of the proposed routes will be determined during detailed engineering design, if the Board approves the Project.

(a) Design Voltage

The Project will be designed for and operated at 138 kV.

(b) Tower Designs, Pole Structures, Conductor Size and Number per Phase, and Insulator Arrangement

The proposed new transmission line will be supported on multiple structure types. The general features of these structures are described in the following sections. The following structure descriptions will be utilized on both the Preferred and Alternate Routes, and are shown in diagrams provided as Figure 5-1, Exhibits 1 through 20.

1. Exhibit 1 conceptionally shows a typical single circuit post delta tangent structure. The structure consists of a single wood pole with three horizontal post insulators to support the transmission conductors at tangent locations. Optional guying may be utilized when a small change in centerline direction is required.

2. Exhibit 2 conceptually shows a typical single circuit post vertical light angle structure. The structure consists of a single wood pole with three post insulators and down guys to support the structure at light angle locations.

3. Exhibit 3 conceptually shows a typical single circuit suspension vertical medium angle structure. The structure consists of a single wood pole with three suspension insulators and down guys to support the structure at medium angle locations.

4. Exhibit 4 conceptually shows a typical single circuit suspension vertical heavy angle structure. The structure consists of a single wood pole with three suspension insulators and down guys to support the structure at heavy angle locations.

5. Exhibit 5 conceptually shows a typical single circuit dead end vertical structure. The structure will consist of a single wood pole with 6 strain insulators and down guys to support the transmission line when it is desirable to utilize strain insulators at medium and heavy angle locations.

6. Exhibit 6 conceptionally shows a typical double circuit post vertical structure. The structure will consist of a single wood pole with six horizontal post insulators to support the transmission conductors at tangent locations.

7. Exhibit 7 conceptually shows a typical double circuit post vertical two pole structure. The structure consists of two wood poles with six horizontal post insulators and down guys to support the transmission line at light angle locations.

8. Exhibit 8 conceptually shows a double circuit dead end vertical two pole structure. The structure consists of two wood poles with 12 strain insulators and down guys to support the transmission line when it is desirable to utilize strain insulators at medium and heavy angle locations.

9. Exhibit 9 conceptually shows a typical single circuit suspension H-frame two pole structure. The structure consists of two wood poles and three suspension insulators to support the transmission line at tangent locations.

10. Exhibit 10 conceptually shows a typical single circuit suspension three pole angle structure. The structure consists of three wood poles and three suspension insulators to support the transmission line at light and medium angle locations.

11. Exhibit 11 conceptually shows a typical single circuit dead end angle structure. The structure consists of three wood poles and six strain insulators to support the transmission line when it is desirable to utilize strain insulators at medium and heavy angle locations.

12. Exhibit 12 conceptually shows a typical single circuit strain crossing structure. The structure consists of three wood poles and six strain insulators to support the conductor wires with a fourth pole to support the overhead ground wire at tangent locations where the transmission line crosses under another nearby transmission line.

13. Exhibit 13 conceptually shows a typical double circuit strain H-frame crossing structure. The structure consists of 2 wood poles and twelve strain insulators to support the transmission line where the transmission line crosses under another nearby transmission line.

14. Exhibit 14 conceptually shows a typical double circuit dead end vertical steel structure. The structure is used to support the transmission line where it is desirable to terminate a section of transmission line wire at tangent and/or angle locations. A concrete foundation is utilized to support the structure and eliminate the need for guying.

15. Exhibit 15 conceptually shows a typical double circuit suspension vertical steel structure. The structure is used to support the transmission line in tangent locations. A concrete foundation is utilized to support the structure.

16. Exhibit 16 conceptually shows a typical single circuit dead end vertical tap steel structure. The structure is used to create a tap or loop along the transmission line. A concrete foundation is utilized to support the structure.

17. Exhibit 17 conceptually shows a typical single circuit suspension delta steel structure. The structure is used to support the transmission line at tangent or light angle locations. A concrete foundation is utilized to support the structure.

18. Exhibit 18 conceptually shows a typical single circuit dead end delta steel structure. This structure is used to support the transmission line where it is desirable to terminate a section of transmission line wire at tangent and/or angle locations. A concrete foundation is utilized to support the structure and eliminate the need for guying.

19. Exhibit 19 conceptually shows a typical single circuit dead end vertical steel structure. This structure is used to support the transmission line where it is desirable to terminate a section of transmission line wire at tangent and/or angle locations. A concrete foundation is utilized to support the structure and eliminate the need for guying.

20. Exhibit 20 conceptually shows a typical double circuit special steel crossing structure. This structure is used to allow two circuits to swap attachment positions along the transmission line.

At this time, engineering evaluation of the Project has not revealed the need for any types of structures other than those shown in Figure 5-1 Exhibits 1 through 20. It is possible that detailed design engineering for the Project may reveal the need for other structure types to meet the needs of the Project. However, ATSI does not anticipate that any such structures will be substantially different from those depicted in the Application.

The conductor used for both the Preferred and Alternate Routes will be designed and constructed for 138-kV operation and will utilize 795 thousand circular mils (kcmil) 26/7 aluminum conductor steel-reinforced cable (ACSR) per phase. This conductor has a maximum strength of approximately 31,500 pounds. Overhead Ground Wire and/or Optical Ground Wire (OPGW) will be installed above the conductor phases to provide lightning protection. The phase conductors and overhead ground wires will be installed in accordance with the latest version of the National Electrical Safety Code (NESC).

(c) Base and Foundation Design

A select number of steel structures on concrete foundations will be necessary. The excavation for each concrete foundation will be approximately 7 feet in diameter and 25 feet deep.

(d) Cable Type and Size, where Underground

No underground cables are associated with this Project; therefore, this section is not applicable.

(e) Other Major Equipment or Special Structures

No other major equipment or special structures are required for the Project.

(2) Diagram of Electric Power Transmission Substations

No new electric power transmission substations are proposed for this Project. The existing Wellington Substation will be expanded as part of this Project. Drawings of the substation expansion are provided in Appendix 5-1.

The Wellington Substation will be expanded by an additional 0.96 acres to facilitate the installation of new equipment in the substation. This represents a 188 percent expansion of the substation within its existing parcel. To accommodate the addition of this new expansion area, approximately 840 linear feet of addition fence will be installed.

The following equipment will be installed as part of this expansion:

- 138/69kV Transformer – (1)
- 138kV Transformer MOAB – (2) Sets of 3
- 138kV Circuit Breakers – (4)
- 138kV Breaker Disconnect Switches – (8) Sets of 3
- 138kV Line Exit GOAB – (2) Sets of 3
- 138kV Capacitive Voltage Transformer “CCVT” – (4) Sets of 3
- 138kV Station Service Voltage Transformer “SSVT” - (1)
- 69kV Circuit Breakers – (2)
- 69kV Breaker Disconnect Switches – (4) Sets of 3
- 69kV Transformer Transfer Bus Switch – (1) Set of 3

4906-5-06 ECONOMIC IMPACT AND PUBLIC INTERACTION

(A) OWNERSHIP OF PROPOSED FACILITY

ATSI will construct, own, operate, and maintain the proposed 138 kV transmission line.

In general, ATSI will obtain, through negotiation with property owners, any easements necessary for the ROW for the Project, although acquiring property rights by fee purchase of land or other types of agreements may occur.

Although ATSI endeavors to reach an amicable agreement with all impacted property owners, it is possible that some property owners may not be willing to provide ATSI with the necessary easements on negotiated terms. Where the necessary ROW for the transmission line along the route approved by the OPSB cannot be obtained through negotiations, appropriation of the necessary ROW will be pursued.

(B) CAPITAL AND INTANGIBLE COSTS ESTIMATE FOR ELECTRIC POWER TRANSMISSION FACILITY ALTERNATIVES

Table 6-1 includes estimates of applicable intangible and capital costs for both the Preferred and Alternate Routes of the entire Project. Cost estimates are provided only for those items listed in the rule that are applicable to this Project.

Table 6-1. Estimates of Applicable Intangible and Capital Costs for Both the Preferred and Alternate Sites – Entire Project

FERC Account Number	Description	Preferred Route	Alternate Route
350	Land and Land Rights, Engineering Construction, etc.	$392,600	$377,500
352	Structures and Improvements	$1,791,204	$1,791,204
353	Substation Equipment	$6,956,596	$6,956,596
354	Towers and Fixtures	$0	$0
355	Poles and Fixtures	$7,010,640	$10,087,023
356	Overhead Conductors and Devices	$8,527,260	$15,166,077
357	Underground Conductors and Insulation	$0	$0
358	Underground-to-Overhead Conversion Equipment	$0	$0
359	Right-of-Way Clearing, Roads, Trails, or Other Access	$0	$0
TOTAL		**$24,678,300**	**$24,378,401**

FERC = Federal Energy Regulatory Commission

(C) CAPITAL AND INTANGIBLE COSTS ESTIMATE FOR GAS TRANSMISSION FACILITY ALTERNATIVES

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

(D) PUBLIC INTERACTION AND ECONOMIC IMPACT

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

(a) Brownhelm Section

The Preferred and Alternate Routes are located within Amherst Township and Brownhelm Township, Lorain County. Neither route is located within 1,000 feet of any villages or cities.

(b) Wellington Section

The Preferred Route is located within Wellington Township, Huntington Township, and Rochester Township, Lorain County. The Preferred Route is not located within 1,000 feet of any villages or cities. The Alternate Route is located within Wellington Township and Brighton Township, Lorain County. The Alternate Route crosses the southern part of the Village of Wellington.

(c) Wellington Substation Expansion

The Wellington Substation expansion is located within Wellington Township, Lorain County. No villages or cities are located within 1,000 feet of the Wellington Substation expansion.

(2) Public Officials Contacted

ATSI contacted several local officials to discuss the Project. 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 or will be provided a digital or hard copy of the Application.

(3) Planned Public Interaction

ATSI mailed letters to residents, tenants, and elected officials, issued a public notice and a news release to the local media, created a project website, hosted two public information meetings (one for each new construction section of the Project), and conducted a virtual public information session. ATSI will also complete all necessary notice requirements associated with the filing of this application and the subsequent public and adjudicatory hearings as required by the OPSB’s rules.

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

During this Project, the public may direct questions or comments to the FirstEnergy Transmission Projects hotline at 1-800-589-2837, or email transmissionProjects@firstenergycorp.com.

ATSI requests that any communications concerning the Project include the Project name. To access the project's website, please visit https://www.firstenergycorp.com/about/transmission_projects/ohio.html and click the project website link.

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

- Go to the local library;
- Go to http://opsb.ohio.gov/ and search for the Project's case number; or
- Access the Projects website on: https://www.firstenergycorp.com/about/transmission_projects/ohio.html and follow the directions to obtain a copy.

ATSI is logging comments and information provided through its public interaction program and this information will be shared with the OPSB staff, if requested.

At least 7 days before any construction activities, an ATSI ROW agent will notify the landowner or the tenant by mail, telephone, or in person, depending on landowner preference.

(4) Liability Insurance or Compensation

FirstEnergy, as the parent company of ATSI, currently self-insures against commercial general liability and property damage exposure, as well as commercial liability exposure in connection with its automobile operations. ATSI purchases excess Commercial General Liability insurance covering indemnity to at least $35,000,000 in excess of $10,000,000. This insurance is on a per occurrence basis and is arranged under a broad form that includes automobile and contractual liability. Present coverage is arranged with AEGIS and is renewable on a year-to-year basis.

(5) Tax Revenues

The Preferred and Alternate Routes for the entire Project are located within Lorain County. Local school districts, park districts, and fire departments will receive tax revenue from the Project. ATSI will pay property taxes on utility facilities in each jurisdiction. The approximate annual property taxes associated with the Preferred Route for the entire Project over the first year after the Project is completed is $1,910,299. The approximate annual property taxes associated with the Alternate Route for the entire Project over the first year after the Project is completed is $1,891,733.

Based on the 2019 tax rates, the following information includes preliminary estimates for these taxing authorities.

(a) Preferred Route – Entire Project

Lorain County	$306,877
Amherst City	$207
Lorain City	$8,587
Amherst Township	$902

Brownhelm Township	$31,306
Henrietta Township	$0
Camden Township	$45,688
Brighton Township	$0
Rochester Township	$5,942
Huntington Township	$0
Wellington Township	$8,402
Firelands Local School District	$857,380
Black River Local School District	$182,028
Amherst Exempted Village School District	$4,814
Vermilion Local School District	$44,307
Wellington Exempted Village School District	$413,858
	TOTAL $1,910,299

(b) Alternate Route – Entire Project

Lorain County	$303,510
Amherst City	$243
Lorain City	$10,060
Amherst Township	$5,166
Brownhelm Township	$28,508
Henrietta Township	$0
Camden Township	$53,522
Brighton Township	$0
Wellington Township	$9,594
Village of Wellington	$4,456
Amherst Exempted Village School District	$27,222
Firelands Local School District	$994,844
Vermilion Local School District	$51,904
Wellington Exempted Village School District	$402,706
	TOTAL $1,891,733

4906-5-07 HEALTH AND SAFETY, LAND USE, AND REGIONAL DEVELOPMENT

(A) HEALTH AND SAFETY

(1) Compliance with Safety Regulations

The construction, operation, and maintenance of the Project will comply with the requirements of applicable State and Federal statutes and regulations related to safety, including requirements specified in the North American Electric Reliability Corporation ("NERC") Mandatory Reliability Standards and the National Electrical Safety Code ("NESC"), as well as those adopted by PUCO. Applicant will also comply with applicable safety standards established by the Occupational Safety and Health Administration (OSHA).

(2) Electric and Magnetic Fields

In accordance with the OPSB requirements specified in OAC 4906-5-07(A)(2), the following subsections provide an analysis of the EMF associated with the Project.

(a) Calculated Electric and Magnetic Field Strength Levels

The following calculations provide an approximation of the magnetic and electric fields strengths of the proposed 138 kV transmission line at particular locations associated with the Project. The calculations provide an approximation of the electric and magnetic field levels based on specific assumptions utilizing the Electric Power Research Institute (EPRI) EMF Workstation 2015 program software.

Factors that affect the level of magnetic and electric fields that are considered in the modeling include variance in the daily and Projected long-term transmission line loading, operating voltage, contingency operations, phase configuration, direction of current flows, conductor sag, ground elevation, unbalance conditions, and other nearby magnetic field sources or conductors of neutral current including water mains, metallic fences, and railroad tracks. Electric field computations used for this modeling also assume that shrubs, trees, buildings, and other objects are not in close proximity to the facilities, as they produce significant shielding effects. Finally, other transmission or distribution facilities near the transmission line will also affect the calculated fields. For example, a double-circuit loop configuration, with current flows in opposite directions, results in a partial reduction (cancellation) of the magnetic field levels.

The model and calculations used in this Application also include a number of assumptions including the following:

- Current flows are assumed in the direction expected under normal system operating conditions.
- The location of transmission line poles, attached conductors and static wire, and line phasing are based on preliminary engineering layouts.
- The calculated field levels assume a reference point approximately 3 feet (1 meter) above ground.

Using these assumptions, three loading conditions were modeled for the proposed transmission line: 1) the winter normal conductor rating, 2) emergency line loading, and 3) normal maximum loading. The winter normal conductor rating represents the maximum current flow that the conductor can withstand during winter conditions. It is not anticipated that the transmission line would be operated at the winter normal conductor rating level of current flow. The emergency maximum loading represents the maximum current flow in the transmission line under unusual circumstances and only for a short period of times. The normal maximum loading represents the routine maximum loading that the transmission line would be operated. Daily current load levels would fluctuate below this level.

The transmission line loadings used in the calculations are presented in Table 7-1. The conductor configurations are the same over the entire lengths of the Preferred and Alternate Routes. The ROW width varies between 60 feet to 400 feet for the Project. Field strengths were modeled for all configurations under consideration for the portions of both routes that would be within 100 feet of a residential structure, would occupy more than 10% of the respective proposed route, where the route changes direction, or a change in structure type.

Table 7-1. Transmission Line Loadings

Line Name	Winter Conductor Rating (Amps)	Emergency Loading (Amps)	Normal Loading (Amps)
Beaver-Wellington 138kV Transmission Line	1320	1417	1165
Wellington (Brookside) 138 kV	758	546.8	439.3
Beaver-Henrietta 138 kV	1102	811.6	673.6
Beaver-Johnson 138 kV	1320	1179.8	974.8
Beaver-Black River 138 kV	1320	1418.3	1163.1
Beaver-Hayes 345 kV	1320	3085.9	2523.6
Beaver-Davis Besse 345 kV	1320	3142.8	2580.5
Beaver-Carlisle 345 kV	1320	3142.8	2580.5
Brookside-Henrietta 138 kV	760	811	675
Hanville-Wellington 69 kV	946	1062	838
Henrietta-Johnson 69 kV	754	805	670
Carlisle-Shinrock 138 kV	1062	1121	920

The calculated electric and magnetic fields for the different configurations are shown in Tables 7-2 through 7-33. References to Exhibits 1 through 20 can be found under Figure 5-1.

Table 7-2. EMF Calculations for a Typical Tangent to Tangent Span Configuration on the Brookside-Henrietta 138 kV Transmission Line Un-Six-Wire Section for the Beaver-Wellington 138 kV Transmission Line Project Preferred Route

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.082	80.17
	At Right-of-Way Edge	0.333 / 0.34	49.44 / 54.95
Emergency Loading	Under Lowest Conductors	1.082	97.12
	At Right-of-Way Edge	0.333 / 0.34	59.8 / 66.12
Winter Rating	Under Lowest Conductors	1.082	90.65
	At Right-of-Way Edge	0.333 / 0.34	55.86 / 61.91

The Brookside-Henrietta 138 kV Transmission Line Un-Six-Wire section of the Project is a tangent-shared structure configuration between the Brookside-Henrietta 138 kV and the Beaver-Wellington 138 kV Transmission Lines within a 100-foot ROW.

Table 7-3. EMF Calculations for a Typical Tangent to Tangent Span Configuration on the Beaver-Henrietta 138 kV Transmission Line Reconfigure/Convert Section with a Shared ROW with the Henrietta-Johnson 69 kV Line for the Beaver-Wellington 138 kV Transmission Line Project Preferred Route

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.76	165.1
	At Right-of-Way Edge	0.314 / 0.535	45.48 / 70.2
Emergency Loading	Under Lowest Conductors	1.76	202.36
	At Right-of-Way Edge	0.314 / 0.535	55.09 / 80.56
Winter Rating	Under Lowest Conductors	1.76	183.09
	At Right-of-Way Edge	0.314 / 0.535	57.75 / 79.85

The Beaver-Henrietta 138 kV Transmission Line Reconfigure/Convert section is a tangent shared structure configuration between the Beaver-Henrietta 138 kV and the Beaver-Wellington 138 kV Transmission Lines within a 100-foot ROW. In addition, the ROW is shared with the Henrietta-Johnson 69 kV Transmission Line.

Table 7-4. EMF Calculations for a Typical Tangent to Tangent Span Configuration on the Beaver-Henrietta 138 kV Transmission Line Reconfigure/Convert Section for the Beaver-Wellington 138 kV Transmission Line Project Preferred Route

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.105	80.06
	At Right-of-Way Edge	0.348 / 0.35	49.36 / 54.91
Emergency Loading	Under Lowest Conductors	1.105	97.08
	At Right-of-Way Edge	0.348 / 0.35	59.78 / 66.72
Winter Rating	Under Lowest Conductors	1.105	104.39
	At Right-of-Way Edge	0.348 / 0.35	67.33 / 68.88

Table 7-5. EMF Calculations for a Pull-off Structure (Exhibit 16) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route East Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.503	97.59
	At Right-of-Way Edge	0.26 / 0.28	15.25 / 33.5
Emergency Loading	Under Lowest Conductors	1.503	140.99
	At Right-of-Way Edge	0.26 / 0.28	20.52 / 48.5
Winter Rating	Under Lowest Conductors	1.503	104.77
	At Right-of-Way Edge	0.26 / 0.28	21.35 / 36.12

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route east direction is a Pull-off structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-6. EMF Calculations for a Deadend Structure (Exhibit 18) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route East Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.171	114.89
	At Right-of-Way Edge	0.40 / 0.32	16.57 / 36.75
Emergency Loading	Under Lowest Conductors	1.171	139.9
	At Right-of-Way Edge	0.40 / 0.32	20.44 / 43.5
Winter Rating	Under Lowest Conductors	1.171	133.52
	At Right-of-Way Edge	0.40 / 0.32	24.83 / 41.5

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route east direction is a deadend structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-7. EMF Calculations for an Angle Structure (Exhibit 10) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route East Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.813	105.31
	At Right-of-Way Edge	0.361 / 0.521	18.82 / 43.25
Emergency Loading	Under Lowest Conductors	0.813	128.2
	At Right-of-Way Edge	0.361 / 0.521	23.23 / 51.75
Winter Rating	Under Lowest Conductors	0.813	121.77
	At Right-of-Way Edge	0.361 / 0.521	28.65 / 49.95

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route east direction is an angle structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-8. EMF Calculations for a Deadend Structure (Exhibit 18) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route South Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.903	104.68
	At Right-of-Way Edge	0.40 / 0.295	12.61 / 32.12
Emergency Loading	Under Lowest Conductors	0.903	126.53
	At Right-of-Way Edge	0.40 / 0.295	14.65 / 41.75
Winter Rating	Under Lowest Conductors	0.903	115.28
	At Right-of-Way Edge	0.40 / 0.295	19.22 / 39.25

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route south direction is a deadend structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-9. EMF Calculations for an Angle Structure (Exhibit 10) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route South Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line.

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.718	87.64
	At Right-of-Way Edge	0.487 / 0.287	11.5 / 38.75
Emergency Loading	Under Lowest Conductors	0.718	106.54
	At Right-of-Way Edge	0.487 / 0.287	14.23 / 46.85
Winter Rating	Under Lowest Conductors	0.718	98.26
	At Right-of-Way Edge	0.487 / 0.287	18.78 / 43.55

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route south direction is an angle structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-10. EMF Calculations for a Deadend Structure (Exhibit 11) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route East Direction with a Shared ROW with the Brookside-Wellington 138 kV Transmission Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.83	107.98
	At Right-of-Way Edge	0.256 / 0.441	14.76 / 37.12
Emergency Loading	Under Lowest Conductors	0.83	131.24
	At Right-of-Way Edge	0.256 / 0.441	17.32 / 47.45
Winter Rating	Under Lowest Conductors	0.83	124.21
	At Right-of-Way Edge	0.256 / 0.441	20.53 / 44.5

This section of the Beaver-Wellington 138 kV Transmission Line Tap Alternative Route east direction is a deadend structure to tangent structure configuration within a 200-foot shared ROW with the existing Brookside-Wellington 138 kV Transmission Line.

Table 7-11. EMF Calculations for a Pull-off Structure (Exhibit 16) to Tangent Structure (Exhibit 6) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route East Direction with a Shared ROW with the Hanville-Wellington 69 kV Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.738	81.5
	At Right-of-Way Edge	0.12 / 0.28	17.83 / 37.75
Emergency Loading	Under Lowest Conductors	1.738	96.64
	At Right-of-Way Edge	0.12 / 0.28	20.77 / 45.12
Winter Rating	Under Lowest Conductors	1.738	91.48
	At Right-of-Way Edge	0.12 / 0.28	19.95 / 42.75

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route east direction is a pull-off structure to tangent structure configuration within a 100-foot shared ROW with the existing Hanville-Wellington 69 kV Line.

Table 7-12. EMF Calculations for a Deadend Structure (Exhibit 8) to Tangent Structure (Exhibit 6) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route East Direction with a Shared ROW with the Hanville-Wellington 69 kV Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.538	59.93
	At Right-of-Way Edge	0.152 / 0.175	10.63 / 21.85
Emergency Loading	Under Lowest Conductors	1.538	66.68
	At Right-of-Way Edge	0.152 / 0.175	12.65 / 25.12
Winter Rating	Under Lowest Conductors	1.538	63.35
	At Right-of-Way Edge	0.152 / 0.175	12.01 / 24.55

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route east direction is a deadend structure to tangent structure configuration within a 100-foot shared ROW with the existing Hanville-Wellington 69 kV Line.

Table 7-13. EMF Calculations for a Deadend Structure (Exhibit 8) to Tangent Structure (Exhibit 6) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route North Direction with a Shared ROW with the Hanville-Wellington 69 kV Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.543	56.41
	At Right-of-Way Edge	0.152 / 0.185	11 / 21.25
Emergency Loading	Under Lowest Conductors	1.543	67.38
	At Right-of-Way Edge	0.152 / 0.185	13.19 / 24.65
Winter Rating	Under Lowest Conductors	1.543	64.02
	At Right-of-Way Edge	0.152 / 0.185	12.49 / 24.6

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route north direction is a deadend structure to tangent structure configuration within a 100-foot shared ROW with the existing Hanville-Wellington 69 kV Line.

Table 7-14. EMF Calculations for a Double Circuit Structure (Exhibit 14) to Tangent Structure (Exhibit 6) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route North Direction with a Shared ROW with the Hanville-Wellington 69 kV Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.483	61.55
	At Right-of-Way Edge	0.18 / 0.25	13.36 / 26.12
Emergency Loading	Under Lowest Conductors	1.483	73.89
	At Right-of-Way Edge	0.18 / 0.25	16.33 / 31.35
Winter Rating	Under Lowest Conductors	1.483	69.69
	At Right-of-Way Edge	0.18 / 0.25	15.12 / 30.15

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route north direction is a double circuit structure to tangent structure configuration within a 100-foot shared ROW with the existing Hanville-Wellington 69 kV Line.

Table 7-15. EMF Calculations for a Double Circuit Structure (Exhibit 14) to Tangent Structure (Exhibit 6) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route West Direction with a Shared ROW with the Hanville-Wellington 69 kV Line

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.487	61.46
	At Right-of-Way Edge	0.182 / 0.252	13.14 / 25.86
Emergency Loading	Under Lowest Conductors	1.487	73.38
	At Right-of-Way Edge	0.182 / 0.252	16.51 / 30.76
Winter Rating	Under Lowest Conductors	1.487	69.16
	At Right-of-Way Edge	0.182 / 0.252	15.23 / 29.99

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route west direction is a double circuit structure to tangent structure configuration within a 100-foot shared right-of-way with the existing Hanville-Wellington 69 kV Line.

Table 7-16. EMF Calculations for a Deadend Structure (Exhibit 19) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route West Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.661	48.45
	At Right-of-Way Edge	0.119 / 0.225	24.17 / 28.12
Emergency Loading	Under Lowest Conductors	0.661	58.05
	At Right-of-Way Edge	0.119 / 0.225	29.92 / 34.25
Winter Rating	Under Lowest Conductors	0.661	54.08
	At Right-of-Way Edge	0.119 / 0.225	27.87 / 31.85

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route west direction is a deadend structure to tangent structure configuration within a 100-foot ROW.

Table 7-17. EMF Calculations for a Deadend Structure (Exhibit 19) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route North Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.648	47.76
	At Right-of-Way Edge	0.118 / 0.224	23.85 / 27.82
Emergency Loading	Under Lowest Conductors	0.648	57.27
	At Right-of-Way Edge	0.118 / 0.224	29.55 / 33.88
Winter Rating	Under Lowest Conductors	0.648	53.35
	At Right-of-Way Edge	0.118 / 0.224	27.53 / 31.51

This section of the Beaver-Wellington 138 kV Transmission Line Tap Preferred Route north direction is a deadend structure to tangent structure configuration within a 100-foot ROW.

Table 7-18. EMF Calculations for a Deadend Structure (Exhibit 5) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Preferred Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.876	75.83
	At Right-of-Way Edge	0.17 / 0.295	35 / 48.45
Emergency Loading	Under Lowest Conductors	0.876	91.46
	At Right-of-Way Edge	0.17 / 0.295	42.44 / 58.85
Winter Rating	Under Lowest Conductors	0.876	85.57
	At Right-of-Way Edge	0.17 / 0.295	39.77 / 55.35

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Preferred Route east direction is a deadend structure to tangent structure configuration within a shared 100-foot ROW with the existing Carlisle-Shinrock 138 kV Transmission Line.

Table 7-19. EMF Calculations for a Double Circuit Structure (Exhibit 14) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Preferred Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.223	98.62
	At Right-of-Way Edge	0.296 / 0.298	56.47 / 57.91
Emergency Loading	Under Lowest Conductors	1.223	120.05
	At Right-of-Way Edge	0.296 / 0.298	68.75 / 71.12
Winter Rating	Under Lowest Conductors	1.223	112.65
	At Right-of-Way Edge	0.296 / 0.298	64.61 / 66.5

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Preferred Route east direction is a Double Circuit structure to tangent structure configuration within a shared 100-foot ROW with the existing Carlisle-Shinrock 138 kV Transmission Line.

Table 7-20. EMF Calculations for a Double Circuit Structure (Exhibit 14) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Preferred Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.652	54.42
	At Right-of-Way Edge	0.256 / 0.328	37.60 / 35.5
Emergency Loading	Under Lowest Conductors	0.652	70.31
	At Right-of-Way Edge	0.256 / 0.328	44.75 / 48.78
Winter Rating	Under Lowest Conductors	0.652	60.52
	At Right-of-Way Edge	0.256 / 0.328	19.99 / 44.12

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Preferred Route south direction is a Double Circuit structure to tangent structure configuration within a shared 300-foot ROW with the existing Beaver-Hayes 345 kV, Beaver-David Besse 345 kV, and Beaver-Carlisle 345 kV Transmission Lines.

Table 7-21. EMF Calculations for a Tangent Structure (Exhibit 1) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Preferred Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.507	43.67
	At Right-of-Way Edge	0.245 / 0.307	27.45 / 36.85
Emergency Loading	Under Lowest Conductors	0.507	57.75
	At Right-of-Way Edge	0.245 / 0.307	37.75 / 42.65
Winter Rating	Under Lowest Conductors	0.507	46.56
	At Right-of-Way Edge	0.245 / 0.307	17.72 / 33.35

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Preferred Route south direction is a tangent structure to tangent structure configuration within a shared 300-foot ROW with the existing Beaver-Hayes 345 kV, Beaver-David Besse 345 kV, and Beaver-Carlisle 345 kV Transmission Lines.

Table 7-22. EMF Calculations for an Angle Structure (Exhibit 3) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Preferred Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.64	55.47
	At Right-of-Way Edge	0.257 / 0.355	38.1 / 37.65
Emergency Loading	Under Lowest Conductors	0.64	70.94
	At Right-of-Way Edge	0.257 / 0.355	41.15 / 51.11
Winter Rating	Under Lowest Conductors	0.64	60.76
	At Right-of-Way Edge	0.257 / 0.355	19.25 / 46.75

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Preferred Route south direction is an angle structure to tangent structure configuration within a shared 300-foot ROW with the existing Beaver-Hayes 345 kV, Beaver-David Besse 345 kV, and Beaver-Carlisle 345 kV Transmission Lines.

Table 7-23. EMF Calculations for a Double Circuit Pull-off Structure (Exhibit 20) to Tangent Structure Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.913	66.16
	At Right-of-Way Edge	0.299 / 0.31	39.06 / 46.25
Emergency Loading	Under Lowest Conductors	0.913	80.28
	At Right-of-Way Edge	0.299 / 0.31	47.33 / 55.95
Winter Rating	Under Lowest Conductors	0.913	83.91
	At Right-of-Way Edge	0.299 / 0.31	52.16 / 57.6

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route south direction is a double circuit pull-off structure to tangent structure configuration within a shared 100-foot ROW with the existing Beaver-Henrietta 138 kV Transmission Line.

Table 7-24. EMF Calculations for a Double Circuit Pull-off Structure (Exhibit 20) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route West Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.603	50.04
	At Right-of-Way Edge	0.29 / 0.35	37.33 / 40.15
Emergency Loading	Under Lowest Conductors	0.603	60.86
	At Right-of-Way Edge	0.29 / 0.35	45.4 / 48.65
Winter Rating	Under Lowest Conductors	0.603	56.7
	At Right-of-Way Edge	0.29 / 0.35	42.29 / 45.45

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route west direction is a double circuit pull-off structure to tangent structure configuration within a 60-foot ROW.

Table 7-25. EMF Calculations for an Angle Structure (Exhibit 3) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route West Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.596	50.63
	At Right-of-Way Edge	0.29 / 0.349	37.6 / 40.61
Emergency Loading	Under Lowest Conductors	0.596	61.58
	At Right-of-Way Edge	0.29 / 0.349	45.74 / 49.35
Winter Rating	Under Lowest Conductors	0.596	57.37
	At Right-of-Way Edge	0.29 / 0.349	42.61 / 46

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route west direction is an angle structure to tangent structure configuration within a 60-foot ROW.

Table 7-26. EMF Calculations for an Angle Structure (Exhibit 3) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.754	63.65
	At Right-of-Way Edge	0.3 / 0.451	43.73 / 51.75
Emergency Loading	Under Lowest Conductors	0.754	77.42
	At Right-of-Way Edge	0.3 / 0.451	53.19 / 62.6
Winter Rating	Under Lowest Conductors	0.754	72.12
	At Right-of-Way Edge	0.3 / 0.451	49.55 / 57.9

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route south direction is an angle structure to tangent structure configuration within a 60-foot ROW.

Table 7-27. EMF Calculations for a Deadend Structure (Exhibit 19) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.756	63.43
	At Right-of-Way Edge	0.299 / 0.451	43.75 / 51.5
Emergency Loading	Under Lowest Conductors	0.756	77.15
	At Right-of-Way Edge	0.299 / 0.451	53.21 / 62.5
Winter Rating	Under Lowest Conductors	0.756	71.87
	At Right-of-Way Edge	0.299 / 0.451	49.57 / 57.8

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route south direction is a deadend structure to tangent structure configuration within a 60-foot ROW.

Table 7-28. EMF Calculations for a Deadend Structure (Exhibit 19) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	0.691	59.29
	At Right-of-Way Edge	0.378 / 0.382	46.35 / 46.45
Emergency Loading	Under Lowest Conductors	0.691	72.12
	At Right-of-Way Edge	0.378 / 0.382	56.38 / 56.47
Winter Rating	Under Lowest Conductors	0.691	67.18
	At Right-of-Way Edge	0.378 / 0.382	52.52 / 52.61

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route east direction is a deadend structure to tangent structure configuration within a 60-foot ROW.

Table 7-29. EMF Calculations for a Deadend Structure (Exhibit 19) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.176	99.28
	At Right-of-Way Edge	0.314 / 0.642	39.38 / 85.25
Emergency Loading	Under Lowest Conductors	1.176	120.5
	At Right-of-Way Edge	0.314 / 0.642	47.68 / 103.5
Winter Rating	Under Lowest Conductors	1.176	123.15
	At Right-of-Way Edge	0.314 / 0.642	53.21 / 105.15

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route south direction is a deadend structure to tangent structure configuration within a shared 100-foot ROW with the existing Beaver-Johnson 138 kV and Beaver-Henrietta 138 kV Transmission Lines.

Table 7-30. EMF Calculations for a Deadend Structure (Exhibit 5) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route South Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.165	85.16
	At Right-of-Way Edge	0.343 / 0.505	53.21 / 64.25
Emergency Loading	Under Lowest Conductors	1.165	103.25
	At Right-of-Way Edge	0.343 / 0.505	64.42 / 78.12
Winter Rating	Under Lowest Conductors	1.165	110.12
	At Right-of-Way Edge	0.343 / 0.505	72.93 / 82.75

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route south direction is a deadend structure to tangent structure configuration within a shared 100-foot ROW with the existing Beaver-Johnson 138 kV and Beaver-Henrietta 138 kV Transmission Lines.

Table 7-31. EMF Calculations for a Deadend Structure (Exhibit 5) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.477	120.58
	At Right-of-Way Edge	0.085 / 0.445	16.5 / 54.25
Emergency Loading	Under Lowest Conductors	1.477	145.93
	At Right-of-Way Edge	0.085 / 0.445	18.75 / 67.35
Winter Rating	Under Lowest Conductors	1.477	163.25
	At Right-of-Way Edge	0.085 / 0.445	19.96 / 69.95

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route east direction is a deadend structure to tangent structure configuration within a shared 400-foot ROW with the existing Beaver-Johnson 138 kV and Beaver-Henrietta 138 kV Transmission Lines.

Table 7-32. EMF Calculations for an Angle Structure (Exhibit 3) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.014	68.62
	At Right-of-Way Edge	0.563 / 0.665	47.02 / 52
Emergency Loading	Under Lowest Conductors	1.014	83.46
	At Right-of-Way Edge	0.563 / 0.665	57.2 / 63.75
Winter Rating	Under Lowest Conductors	1.014	74.97
	At Right-of-Way Edge	0.563 / 0.665	52.09 / 54.35

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route east direction is an angle structure to tangent structure configuration within a shared 60-foot ROW with the existing Beaver-Hayes 345 kV, Beaver-David Besse 345 kV, and Beaver-Carlisle 345 kV Transmission Lines.

Table 7-33. EMF Calculations for a Deadend Structure (Exhibit 5) to Tangent Structure (Exhibit 1) Span Configuration on the Beaver-Henrietta Section of the Beaver-Wellington 138 kV Transmission Line Alternate Route East Direction

Line EMF Calculations		Electric Field (kV/meter)	Magnetic Field (mGauss)
Normal Loading	Under Lowest Conductors	1.015	67.28
	At Right-of-Way Edge	0.565 / 0.665	48.15 / 48.35
Emergency Loading	Under Lowest Conductors	1.015	81.83
	At Right-of-Way Edge	0.565 / 0.665	58.57 / 58.6
Winter Rating	Under Lowest Conductors	1.015	74.3
	At Right-of-Way Edge	0.565 / 0.665	52.44 / 52.46

The Beaver-Henrietta section of the Beaver-Wellington 138 kV Transmission Line Alternate Route east direction is a deadend structure to tangent structure configuration within a shared 60-foot ROW with the existing Beaver-Hayes 345 kV, Beaver-David Besse 345 kV, and Beaver-Carlisle 345 kV Transmission Lines.

Typical cross section profiles of the normal calculated electric fields and magnetic fields at normal loading, emergency loading and winter conductor rating for all scenarios considered are shown in Exhibits 7-1 through 7-32 (Appendix 7-1).

(b) Current State of EMF Knowledge

Electric and magnetic fields (EMF) are naturally occurring in the environment and can be found in the Earth's interior and in the human body. They are generated essentially anywhere where there is a flow of electricity, including electrical appliances and power equipment. Electric fields are associated with the voltage of the source; magnetic fields are associated with the flow of current in a wire. The strength of these fields decreases rapidly with distance from the source. EMFs associated with electricity use are not disruptive to cells like x-rays or ultraviolet rays from the sun. EMF fields are thought to be too weak to break molecules or chemical bonds in cells. Scientists have conducted extensive research over the past several decades to determine whether EMFs are associated with adverse health effects, nor has it been shown that levels in everyday life are harmful.

As part of the National Energy Policy Act of 1992, the Electric and Magnetic Fields Research and Public Information Dissemination (EMF RAPID) program was initiated within the 5-year effort under the National EMF Research Program. The culmination of this 5-year effort was a final RAPID Working Group report, which was released for public review in August 1998. The Director of the National Institutes of Environmental Health Sciences (NIEHS) then prepared a final report to Congress after receiving public comments. The NIEHS' Director's final report, released to Congress on May 4, 1999, concluded that extremely low frequency electric and magnetic fields (ELF-EMF) exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. The Director further stated that the conclusion of this report is insufficient to warrant aggressive regulatory concern.

The following websites sponsored by Federal agencies or other organizations provide additional information on EMF:

Centers for Disease Control/National Institute for Occupational Safety and Health: http://www.cdc.gov/niosh/topics/emf/

- NIEHS: http://www.niehs.nih.gov/health/topics/agents/emf/

(c) Line Design Considerations

To minimize the EMFs associated with the construction of the Project, ATSI uses design considerations to reduce the strength of EMFs. For instance, the strength of EMFs can potentially be reduced by installing the transmission line conductors in a compact configuration. Additionally, for multiple circuit transmission lines such as proposed in this Project, selecting certain conductor phasing configurations can reduce the field strengths.

For this Project, ATSI plans to complete final engineering of the facilities according to the requirements of the NESC. The pole heights and configuration were chosen based on, among other considerations, NESC specifications and engineering parameters and should help minimize EMF strength. It is also ATSI's typical practice, as proposed in the new construction portions of this Project, to install 138 kV transmission lines primarily on wood tangent structures supported on horizontal post insulators, which is a form of compact design that reduces EMF field strengths as compared to other installations.

(d) EMF Public Inquiries Policy

Information on EMF was available at the Public Information Meetings held for the Project on January 7 and 8, 2020. This information included a discussion of basic information on electric magnetic field theory, scientific research activities and EMF levels in everyday life. Appendix 6-2 contains copies of this information. Similar materials will be available upon request to persons along the Project routes.

(3) Estimate of Radio, Television, and Communications Interference

No radio or television interference is expected to occur from the operation of the proposed transmission line along either the Preferred or Alternate Routes. During the operation of transmission lines, gas type discharges (corona) could result in either radio frequency interference (RFI) noise and television interference (TVI) noise under certain conditions. However, large corona levels are typically not encountered at 138 kV, so these types of interference do not generally occur. Consequently, for this Project the potential for radio or television interference is very low.

Further, although radio frequency noise level of the transmission line during heavy rain is greater than the fair weather noise level, the quality of radio reception under typical heavy rain conditions is affected more by atmospheric conditions than by operation of transmission lines. Therefore, the construction of the Project is not expected to increase radio frequency noise levels.

Finally, the gas-type (corona) discharges that can produce RFI and TVI are typically localized effects, resulting primarily from defective hardware (ball and socket hardware in insulators, hardware-to-hardware, line to hardware, etc.) and may be easily and quickly detected. Once detected, the hardware will be repaired or replaced, thus eliminating the interference source.

(4) Noise from Construction, Operations, and Maintenance

(a) Blasting Activities

Blasting activities will not be necessary during construction of the Project.

(b) Operation of Earth Moving and Excavating Equipment

Applicant expects that excavation and earth moving will be limited to drilling auger holes for the poles. A vehicle-mounted auger will be used to bore holes and each wood pole will be direct embedded in an approximately 3-foot diameter hole, 9 to 17 feet deep. In the few select locations where steel poles are needed, an excavator will dig a circular area approximately 7 feet in diameter, and approximately 25 feet deep for the concrete foundation. This activity will result in a temporary increase in noise in the vicinity of the Project. Construction activity will generally be limited to daylight hours and will conform to OSHA noise standards. Thus, noise effects are anticipated to be localized, minimal and of short duration.

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

No driving of piles, rock breaking or hammering, or horizontal directional drilling is anticipated during construction of the Project.

(d) Erection of Structures

Pole structures will be installed by vehicle-mounted cranes or equivalent equipment. Self-supporting steel poles will require delivery of concrete for foundation construction, including excavation work for the foundation. The noise associated with these activities will be localized, temporary and generally not louder than the noise generated by earth moving equipment.

(e) Truck Traffic

An increase in truck traffic is anticipated during the construction of the Project for equipment access and equipment delivery. No other additional traffic is anticipated for the Project beyond infrequent, ongoing maintenance.

(f) Installation of Equipment

The equipment will be installed using standard practices and equipment. The noise associated with this activity will be localized, temporary and generally not louder than the noise generated by earth moving equipment.

(B) LAND USE

(1) Map of the Site and Route Alternatives

An application for a Certificate of Environmental Compatibility and Public Need for electric transmission facilities is required to evaluate both the Preferred and Alternate Routes for the transmission line within the Application. Maps at 1:24,000-scale, including the area 1,000 feet on either side of the centerline, are presented as Figures 7-1 and 7-2 and include the following information:

- Centerline and ROW for the Preferred and Alternate Routes
- Existing Substation locations
- Land use types, road names, structures, and incorporated areas and population centers

(2) Impact on Identified Land Uses

Land use in the Project Area (i.e., within 1,000 feet of each transmission line) consists of agriculture, commercial/industrial, residential, existing roadway ROW, and institutional (i.e., publicly owned lands). Comparisons of the various land use types and land use features for the Preferred and Alternate Routes for the Brownhelm and Wellington Sections are included in Tables 7-34A through 7-36B. The estimates of each land use type being crossed by the transmission line or land use within the 65 to 100-foot wide permanent ROW (linear feet, acreage, and percentages) were determined using geographic information system (GIS) software and field observations.

The potential disturbance area during construction activities (vegetation clearing, pole installations, etc.) is limited to the 65 to 100-foot-wide permanent ROW. The ROW will be restored through soil grading, seeding, and mulching; thus, the permanent impact to the ROW will be limited to the removal of existing trees and other vegetation. Property owners may continue to utilize most of the ROW area for general uses that will not affect the safe and reliable operation of the transmission line. These general uses include lawn maintenance, crop cultivation, and maintaining livestock.

Table 7-34A. Length and Percent of Land Uses Crossed by Route Alternatives – Brownhelm Section

Land Use	Preferred Route*		Alternate Route*	
	Linear Feet	Percent	Linear Feet	Percent
Agriculture	654	10.6	2,540	37.7
Commercial / Industrial	0	0.0	0	0.0
Institutional	0	0.0	0	0.0
Herbaceous (Old Field)	561	9.1	0	0.0
Pavement	49	0.8	31	0.5
Recreational	0	0.0	0	0.0
Residential	307	5.0	442	6.6
Utility ROW	2,876	46.6	1,553	23.0
Woodlot	1,290	20.9	2,038	30.2
Delineated Wetland	299	4.8	94	1.4
Delineated Stream	38	0.6	10	0.1
Delineated Pond	0	0.0	0	0.0
Open Water	93	1.5	37	0.5
Total**	**6,167**	**100.0**	**6,744**	**100.0**

* Numbers in the table are for the route centerlines.

** Total may vary slightly from the sum of their parts due to rounding.

Table 7-34B. Length and Percent of Land Uses Crossed by Route Alternatives – Wellington Section

Land Use	Preferred Route*		Alternate Route*	
	Linear Feet	Percent	Linear Feet	Percent
Agriculture	319	1.0	10,244	45.8
Commercial / Industrial	105	0.3	98	0.4
Institutional	0	0.0	0	0.0
Herbaceous (Old field)	0	0.0	1,168	5.2
Pavement	200	0.6	377	1.7
Recreational	0	0.0	1,001	4.5
Residential	0	0.0	1,282	5.7
Utility ROW	27,339	84.3	403	1.8
Woodlot	49	0.2	4,502	20.1
Delineated Wetland	3,798	11.7	2,703	12.1
Delineated Stream	189	0.6	158	0.7
Delineated Pond	3	0.0	23	0.1
Open Water	413	1.3	417	1.9
Total**	32,415	100	22,376	**100**

* Numbers in the table are for the route centerlines.

** Total may vary slightly from the sum of their parts due to rounding.

Table 7-35A. Acreage and Percent of Land Uses Crossed by Route Alternatives – Brownhelm Section

Land Use	Preferred Route*		Alternate Route*	
	Acreage	Percent	Acreage	Percent
Agriculture	1.2	13.1	2.9	28.5
Commercial / Industrial	0.0	0.0	0.0	0.0
Institutional	0.0	0.0	0.0	0.0
Herbaceous (Old field)	1.4	14.6	0.0	0.0
Pavement	0.1	0.8	0.1	0.6
Recreational	0.0	0.0	0.0	0.0
Residential	0.7	7.3	0.6	6.4
Utility ROW	3.9	42.1	3.5	34.3
Woodlot	1.4	15.0	2.4	24.2
Delineated Wetland	0.5	5.2	0.5	5.4
Delineated Stream	0.1	0.6	<0.1	0.2
Delineated Pond	0.0	0.0	0.0	0.0
Open Water	0.1	1.3	0.1	0.5
Total	**9.3**	**100.0**	**10.1**	**100.0**

*****Numbers in the table are for the planned potential disturbance area which is a nominal 65-foot-wide corridor centered on the route.

** Total may vary slightly from the sum of their parts due to rounding.

Table 7-35B. Acreage and Percent of Land Uses Crossed by Route Alternatives – Wellington Section

Land Use	Preferred Route*		Alternate Route*	
	Acreage	Percent	Acreage	Percent
Agriculture	8.5	16.8	15.3	46.1
Commercial / Industrial	0.2	0.4	0.2	0.6
Institutional	0.0	0.0	0.0	0.0
Herbaceous (Old field)	0.2	0.4	1.6	4.7
Pavement	2.5	5.0	0.6	1.7
Recreational	0.7	1.4	1.7	5.1
Residential	0.1	0.2	1.9	5.7
Utility Right-of-Way	30.2	59.7	0.6	1.8
Woodlot	2.4	4.8	7.3	22.1
Delineated Wetland	4.9	9.8	3.4	10.3
Delineated Stream	0.2	0.5	0.3	0.8
Delineated Pond	0.1	0.1	0.1	0.2
Open Water	0.4	0.9	0.3	0.9
Total**	**50.5**	**100**	**33.2**	**100**

*****Numbers in the table are for the planned potential disturbance area, which is a nominal 65 to 100-foot-wide corridor centered on the route.

** Total may vary slightly from the sum of their parts due to rounding.

Table 7-36A. Number of Sensitive Features within or near the Potential Disturbance Area for the Route Alternatives – Brownhelm Section

Sensitive Features	Route Alternatives	
	Preferred	Alternate
Length (in miles)	1.2	1.3
Features within the Potential Disturbance Area of Route Alternatives*		
Historic Structures (OHI)	0	0
National Register of Historic Places	0	0
Previously Identified Archaeological Sites	0	0
Residences	0	0
Commercial Buildings	0	0
Industrial Buildings	0	0
Schools and Hospitals	0	0
Churches and Civic Buildings	0	0
Recreational Lands	0	0
Airports	0	0
Features within 1,000 feet of Route Alternatives (centerline)		
Historic Structures (OHI)	1	1
National Register of Historic Places	0	0
Previously Identified Archaeological Sites	1	1
Residences	89	70
Commercial Buildings	0	1
Industrial Buildings	0	0
Schools and Hospitals	0	0
Churches and Civic Buildings	0	0
Recreational Land	0	0
Airports	0	0

* The planned potential disturbance area is a nominal 65-foot-wide corridor centered on the route.
OHI = Ohio Historic Inventory

Table 7-36B. Number of Sensitive Features within or near the Potential Disturbance Area for the Route Alternatives – Wellington Section

Sensitive Features	Route Alternatives	
	Preferred	Alternate
Length (in miles)	6.0	4.2
Features within the Potential Disturbance Area of Route Alternatives*		
Historic Structures (OHI)	0	0
National Register of Historic Places	0	0
Previously Identified Archaeological Sites	0	0
Residences	0	2
Commercial Buildings	0	0
Industrial Buildings	0	0
Schools and Hospitals	0	0
Churches and Civic Buildings	0	0
State/Federal Forests and Recreational Lands	1	1
Airports	0	0
Features within 1,000 feet of Route Alternatives (centerline)		
Historic Structures (OHI)	1	1
National Register of Historic Places	1	1
Previously Identified Archaeological Sites	0	0
Residences	19	133
Commercial Buildings	0	13
Industrial Buildings	0	0
Schools and Hospitals	0	0
Churches and Civic Buildings	0	0
State/Federal Forests and Recreational Lands	1	1
Airports	0	0

* The planned potential disturbance area is a nominal 65 to 100-foot-wide corridor centered on the route.
OHI = Ohio Historic Inventory

(a) Residential

(i) Brownhelm Section

Preferred Route: The Preferred Route is located within 1,000 feet of 89 residences, none of which are within the planned potential disturbance area. As shown in Table 7-35A, residential land makes up 7.3 percent of the Preferred Route ROW (65 feet wide).

Alternate Route: The Alternate Route is located within 1,000 feet of 69 residences, none of which are within the planned potential disturbance area. As shown in Table 7-35A, residential land makes up 6.4 percent of the Alternate Route ROW (65 feet wide).

(ii) Wellington Section

Preferred Route: The Preferred Route is located within 1,000 feet of 19 residences, none of which are within the planned potential disturbance area. As shown in Table 7-35B, residential land makes up 0.2 percent of the Preferred Route ROW (65 to 100 feet wide).

Alternate Route: The Alternate Route is located within 1,000 feet of 133 residences, two of which are within the planned potential disturbance area. As shown in Table 7-35B, residential land makes up 5.7 percent of the Alternate Route ROW (65 feet wide).

(b) Commercial

(i) Brownhelm Section

Preferred Route: No commercial buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred Route. As shown in Table 7-35A, none of the Preferred Route ROW (65 feet wide) is comprised of commercial/industrial land.

Alternate Route: No commercial buildings are located within the planned potential disturbance area. One commercial building is located within 1,000 feet of the Alternate Route. As shown in Table 7-35A, none of the Alternate Route ROW (65 feet wide) is comprised of commercial/ industrial land.

(ii) Wellington Section

Preferred Route: No commercial buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred Route. As shown in Table 7-35B, commercial/industrial land makes up 0.4 percent of the Preferred Route ROW (65/100 feet wide). This land use area is entirely comprised of the substation gravel pad with no buildings onsite.

Alternate Route: No commercial buildings are located within the planned potential disturbance area. Thirteen commercial buildings are located within 1,000 feet of the Alternate Route. As shown in Table 7-35B, commercial/industrial land makes up 0.6 percent of the Alternate Route ROW (65 feet wide). This land use area is entirely comprised of the substation gravel pad with no buildings onsite.

(c) Industrial

(i) Brownhelm Section

No industrial buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35A, none of the Preferred Route ROW (65 feet wide) or Alternate Route ROW (65 feet wide) is comprised of industrial land.

(ii) Wellington Section

No industrial buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35B, commercial/industrial land makes up 0.4 percent of the Preferred Route ROW (65/100 feet wide) and 0.6 percent of the Alternate Route ROW (65 feet wide). This land use area is entirely comprised of the substation gravel pad with no buildings onsite.

(d) School and Hospitals

(i) Brownhelm Section

No schools or hospitals are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35A, none of the Preferred Route ROW (65 feet wide) or Alternate Route ROW (65 feet wide) is comprised of institutional land.

(ii) Wellington Section

No schools or hospitals are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35B, none of the Preferred Route ROW (65 feet wide) or Alternate Route ROW (65/100 feet wide) is comprised of institutional land.

(e) Churches and Civic Buildings

(i) Brownhelm Section

No churches or civic buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35A, none of the Preferred Route ROW (65 feet wide) or Alternate Route ROW (65 feet wide) is comprised of institutional land.

(ii) Wellington Section

No churches or civic buildings are located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35B, none of the Preferred Route ROW (65/100 feet wide) or Alternate Route ROW (65 feet wide) is comprised of institutional land.

(f) Recreational

(i) Brownhelm Section

No recreational land is located within the planned potential disturbance area or within 1,000 feet of the Preferred and Alternate Route. As shown in Table 7-35A, none of the Preferred Route ROW (65 feet wide) and Alternate Route ROW (65 feet wide) is comprised of recreational land.

(ii) Wellington Section

Preferred Route: Recreational land (Findley State Park) is located within the planned potential disturbance area and within 1,000 feet of the Preferred Route. As shown in Table 7-35B, recreational land makes up 1.4 percent of the Preferred Route ROW (65/100 feet wide).

Alternate Route: Recreational land (Wellington Reservoir Park) is located within the planned potential disturbance area and within 1,000 feet of the Alternate Route. As shown in Table 7-35B, recreational land makes up 5.1 percent of the Alternate Route ROW (65 feet wide).

(g) Agricultural

(i) Brownhelm Section

As shown in Table 7-35A, approximately 13.1 percent (1.2 acres) of the Preferred Route and 28.5 percent (2.9 acres) of the Alternate Route cross agricultural land. A discussion of agricultural land and Agricultural District Land is provided in Section (C) below.

(ii) Wellington Section

As shown in Table 7-35B, approximately 16.8 percent (8.5 acres) of the Preferred Route and 46.1 percent (15.3 acres) of the Alternate Route cross agricultural land. A discussion of agricultural land and Agricultural District Land is provided in Section (C) below.

(3) Impact on Identified Nearby Structures

(a) Structures within 200 Feet of Proposed Right-of-Way

(i) Brownhelm Section

There are four residences within 200 feet of the Preferred Route ROW; these residences range from 135 to 169 feet from the ROW. There are six residences within 200 feet of the Alternate Route ROW; these residences range from 45 to 122 feet from the ROW. There are no churches, commercial, industrial, or recreational structures, or other structures (i.e., garage, barn) within 200 feet of the proposed ROW for either route.

(ii) Wellington Section

There is one residence within 200 feet of the Preferred Route ROW; this residence is 125 feet from the ROW. There are 10 residences within 200 feet of the Alternate Route ROW; these residences range from 9 to 200 feet from the ROW. One commercial building is within 200 feet of the Alternate Route ROW; it is 95 feet from the ROW. There are no churches, industrial, or recreational structures, or other structures (i.e., garage, barn) within 200 feet of the proposed ROW for either route.

(b) Destroyed, Acquired, or Removed Buildings

The potential removal of structures within the proposed ROW was mitigated during the Route Selection Study through the placement of routes away from structures. It is unlikely that construction of the Preferred or Alternate Routes will require the removal of any residential or commercial structures.

(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 ATSI's acquisition of the ROW for this Project, as part of the negotiated settlement between ATSI 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 ATSI as necessary to meet the appropriate installation requirements.

(C) AGRICULTURAL LAND IMPACTS

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

Brownhelm Section

Agricultural land used for crop cultivation within the Preferred and Alternate Routes ROW is estimated at 1.2 acres and 2.9 acres, respectively. Other herbaceous land that could be used for grazing comprises 1.4 acres of the Preferred Route and none of the Alternate Route ROW.

Wellington Section

Agricultural land used for crop cultivation within the Preferred and Alternate Routes ROW is estimated at 8.5 acres and 15.3 acres, respectively. Other herbaceous land that could be used for grazing comprises 0.2 acre of the Preferred Route and 1.6 acres of the Alternate Route.

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

(1) Agricultural Land Map

The various categories of agricultural land use and Agricultural District lands are depicted on Figures 7-3 and 7-4 for the Brownhelm and Wellington Preferred and Alternate Routes, respectively.

(2) Impacts to Agricultural Lands and Agricultural Districts

The Lorain County Auditor's Office was contacted to obtain information on current Agricultural District lands records. The data was received from the Lorain County Auditor's Office on November 9, 2020. The provided data fulfills the requirement of OAC 4906-5-07 (C)(1)(b), which states this data must be collected not more than 60 days prior to submittal.

Brownhelm Section

The centerline and ROW of the Preferred and Alternate Routes do not cross any Agricultural District parcels. No additional Agricultural District parcels are located within 1,000 feet of either the Preferred or Alternate Routes.

Wellington Section

The centerline and ROW of the Preferred and Alternate Routes do not cross any Agricultural District parcels. No additional Agricultural District parcels are located within 1,000 feet of either the Preferred or Alternate Routes.

(a) Acreage Impacted

Tables 7-35A and 7-35B provide the quantification of the acreage impacted for agricultural land use (crop cultivation and herbaceous land). The agricultural land use was based on aerial imagery and field observations. No Agricultural District Lands are located within 1,000 feet of the Preferred and Alternate Routes for both sections.

(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 and the following agricultural facilities and practices within the Project Area, where present.

(i) Field Operations

Agricultural field operations such as plowing, planting, cultivating, spraying, and harvesting of cultivated crops will only be interrupted for a portion of one growing season or a portion of one dormant season during construction of the Project. Property owners will be compensated for crop damages resulting from ATSI's construction activities. Additionally, no significant impacts to livestock operations or grazing areas are anticipated. Property owners may continue to use most of the ROW area for general uses after construction, such as lawn maintenance, crop cultivation, and livestock, 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 the either route. ATSI will identify the presence of any such systems through contact with landowners once the final route is approved. ATSI will coordinate with any landowner if an irrigation system must be relocated to minimize impacts to the irrigation system's operation. ATSI will ensure that the relocation of any irrigation systems will be at no cost to the landowner.

(iii) Field Drainage Systems

Damage to field tile systems is unlikely given the installation of mostly direct-embed wood poles and a relatively short construction duration, but ATSI will restore any drainage systems damaged by the construction to their pre-construction condition. ATSI 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 agricultural structures within 200 feet of the ROW that will be adversely affected by the construction and operation of the transmission line.

(v) Agricultural Land Viability for Agricultural Districts

The Preferred Route and Alternate Route ROWs do not cross any Agricultural District parcels.

(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 ATSI's acquisition of the ROW for the Project, as part of the negotiated settlement between ATSI and the property owner, or as determined in appropriation proceedings. Additionally, ATSI and the contractors hired to work on the Project have extensive experience in transmission line construction. Both ATSI and the selected contractors will work to minimize agricultural impacts during construction of the Project.

(i) Avoidance or Minimization of Damage

In order to minimize impacts to agricultural operations, ATSI has considered pole placement where the Preferred and Alternate Routes must cross agricultural fields. Where reasonable, poles have been located at the edges of agricultural fields. Where poles are located within agricultural fields, the single wooden poles will cause minimal disruption to agricultural activities. In instances where there is permanent disruption or damage in the ROW, compensation for this limited impact will be provided to the property owner.

(ii) Field Tile System Damage Repairs

Concerns over interference with irrigation systems will be addressed on a case-by-case basis with the individual property owner. In general, ATSI will provide mitigation for damage to underground drainage systems caused by the 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) LAND USE PLANS AND REGIONAL DEVELOPMENT

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

(1) Impacts to Regional Development

This Project is expected to support regional development in Lorain 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 Preferred and Alternate Routes for the Brownhelm and Wellington Sections parallel existing ROWs for a majority of the alignment. Based on the similar land use, it does not appear that the development of the Project will impact land use of the surrounding area. No regional land use development plans were identified for the Project area.

(E) CULTURAL AND ARCHAEOLOGICAL RESOURCES

Cultural resources studies of the Project Areas were conducted on behalf of ATSI. These studies have included a background records check and literature review using data files from the Ohio Historic Preservation Office (OHPO), as well as Phase I archaeological reconnaissance and architectural and historical resources surveys, for the Preferred Route for both the Brownhelm and Wellington Sections of the Project. The results of the Phase I archaeological reconnaissance field investigation of the entirety of the Wellington Section Preferred Route and Brownhelm Section Preferred Route, will be filed with the OPSB.

(1) Cultural Resources Map

Brownhelm Section

Based on the cultural resources desktop study, there are two resources within 1,000 feet of the Preferred Route. The Ohio Archaeological Inventory (OAI)-listed site 33LN0277 is a historic-era archaeological isolate. Site 33LN0277 is recommended ineligible for listing on the National Register of Historic Places (NRHP). The Ohio Historic Inventory (OHI)-listed Hebert Gammons House (OHI #LOR0001326) is a residence along North Ridge Road. The Herbert Gammons House was recommended ineligible for the NRHP. Cultural resources already in the public domain (e.g., OHI-listed resources) are identified on Figure 7-1.

Wellington Section

Based on the cultural resources desktop study, there is one NRHP-listed resource within 1,000 feet of the Preferred Route. The Gunn House (NRHP #79003883; OHI #LOR0135223) is listed on the NRHP for its architectural significance, and as a contributor to a broader group of architecturally significant resources in Lorain County referred to as the Wellington-Huntington Road Multiple Resource Area (MRA). Cultural resources already in the public domain (e.g., OHI-listed resources and Ohio Genealogical Society-recorded cemeteries) are identified on Figure 7-2.

(2) Cultural Resources in Study Corridor

Cultural resources studies to date have involved background research utilizing data files from the OHPO online mapping system and Phase I archaeological reconnaissance surveys and architectural and historical resources surveys for the Preferred Routes. Separate reports summarizing these efforts for the Preferred Route will be filed with the OPSB.

For the background research, a 1-mile buffer was used around both the Preferred and Alternate Routes to identify previously recorded cultural resources and to provide information on the probability of identifying cultural resources within the potential disturbance area. The OHPO online mapping database included a review of the OAI, the OHI, Determination of Eligibility files, the NRHP, Ohio Genealogical Society (OGS)-recorded cemeteries, historic bridges, National Historic Landmarks (NHLs), and previous cultural resources surveys.

Brownhelm Section

No known cultural resources were identified within the potential disturbance area of the Preferred Route from the desktop review; however, the OHI-listed Herbert Gammons House (OHI #LOR0001326) and the OAI-listed archaeological site 33LN0277 are within 1,000 feet of the Preferred Route. The Herbert Gammons House is located along North Ridge Road and has been recommended ineligible for the NRHP. The archaeological site is a historic-era site that is recommended ineligible for the NRHP.

A Phase I archaeological reconnaissance survey was completed along the Preferred Route for the Brownhelm Section in November 2019 and July 2020. No new archaeological sites were identified during the field investigation and no additional archaeological survey is recommended.

The architectural and historical resources field investigation identified five resources within 1,000 feet of the Preferred Route. These consist of residences and a former farmstead. None of the resources is recommended eligible for the NRHP; therefore, no historic properties will be impacted by the Project and no additional work is required.

Wellington Section

No known cultural resources were identified within the potential disturbance area of the Preferred Route from the desktop review; however, the NRHP-listed Gunn House (NRHP #79003883; OHI #LOR0135223) is within 300 feet of the Preferred Route, along South Ashland-

Oberlin Road (SR-58). An architectural and historical resources survey was completed in March 2020.

A Phase I archaeological reconnaissance survey was completed along the Preferred Route for the Wellington Section in January, March, and August 2020. Two archaeological sites were identified during the Phase I archaeological survey. Site 33LN400 consists of a low-density surface artifact scatter of non-diagnostic lithic artifacts. Site 33LN402 consists of a single non-diagnostic lithic debitage. Due to the lack of intact subsurface deposits or features, these sites cannot contribute further information regarding Ohio prehistory and/or history; therefore, Jacobs recommends that sites 33LN400 and 33LN402 are recommended not eligible for listing in the NRHP. No additional archaeological work is recommended. A report summarizing these investigations will be submitted to the OHPO to determine if they agree with these recommendations.

The architectural and historical resources field investigation identified six resources within 1,000 feet of the Preferred Route. These consist of five residences and a railroad. None of the resources not previously listed on the NRHP is recommended eligible for the NRHP. Given the nature of the proposed project, no adverse impacts will occur to the NRHP-listed Gunn House, as the new transmission line will be constructed in the same location as the existing line. Furthermore, existing stands of trees serve to minimize visual intrusions via obstruction or camouflage. Therefore, no historic properties will be adversely impacted by the Project and no additional work is required.

(3) Construction, Operation, and Maintenance Impacts on Cultural Resources

Based on the results of the cultural resources surveys, direct impacts to known cultural resources associated with the construction, operation, and maintenance of the proposed Project are not anticipated. The architectural and historical resources survey and Phase I archaeological survey to-date did identified two archaeological resources within the Project footprint. Site 33LN400 is a diffuse prehistoric lithic scatter and site 33LN402 is a prehistoric isolate. Neither site is recommended eligible for the NRHP and no additional work is recommended. As part of these surveys, an assessment of indirect (i.e., visual) impacts of the Wellington Section to the Gunn House has been conducted. The results of the indirect impact assessment for this resource, as presented in the future architectural and historical resources report, are that the proposed transmission line will not generate a new effect that will diminish the significant qualifying characteristics (i.e., the architectural significance) of the historic property, and as such, no adverse impacts will occur to this resource from the project.

(4) Mitigation Procedures

As noted above, based on the surveys conducted to date, no adverse impacts to known and recorded historic properties are anticipated because of the Project; therefore, no mitigation is proposed at this time. Should any future changes to the project occur, additional cultural resources studies will be conducted to identify potential impacts to NRHP-eligible or listed resources, and any necessary mitigation procedures will be developed in consultation with the OHPO and OPSB.

(5) Aesthetic Impact

(a) Visibility of the Proposed Facility

The viewsheds along the Preferred Routes for both the Brownhelm and Wellington Sections from residences and potentially sensitive vantage points may be altered by the presence of the transmission line. The Project Area consists of flat to gently rolling topography. Many roads in the area are paralleled by wood poles supporting electric transmission lines and/or distribution lines. The addition of the proposed Project will not have a significant impact on the overall visual landscape, as it largely parallels an existing transmission line. At select locations where tree clearing may be required, visual impacts would be greater.

(b) Facility Effect on Site and Surrounding Area

Construction of the proposed Project maintains the potential to affect the existing visual aesthetics of the area through which it passes, primarily in areas where the removal of trees from the ROW may be required, but also by the introduction of a new human-made element on the landscape. The degree of visual impact of a new human-made element will vary with the setting; the impact can be evaluated by comparing the amount of contrast resulting from the construction of the new element and the existing landscape and electric transmission infrastructure. For example, if the transmission line were screened from view, 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. In areas where the transmission line follows or replaces similar facilities, the aesthetic impact would be reduced, because it would create a minor incremental visual change in the existing visual setting.

(c) Visual Impact Minimization

The ability to minimize the visual impacts of the proposed Project is constrained by engineering requirements and existing land use. ATSI has limited the potential aesthetic impacts of the transmission line to the extent possible through the route selection process, and where practical, paralleling or overbuilding existing transmission and existing linear infrastructure.

4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS

ATSI conducted a study to assess the potential effects of construction and operation of the proposed Project on the ecology of the Project Area. A map and literature search were conducted for a 1,000-foot corridor on either side of the centerline of both the Preferred and Alternate Routes of the Brownhelm and Wellington Sections. A field survey of ecological habitat and features was performed within 133 to 150 feet on either side of the centerline for both the Preferred and Alternate Routes of the Brownhelm and Wellington Sections (hereafter referred to as the Field Survey Area). Field surveys on both sections were conducted from September 2019 to July 2020. Information in the following paragraphs addresses ATSI's ecological study conducted for both the Preferred and Alternate Routes for the Brownhelm and Wellington Sections of the Project.

(A) ECOLOGICAL MAP

Maps at a scale of 1:24,000 (1 inch = 2,000 feet) including the corridor 1,000 feet on either side of the centerline (referred to as the 2,000-foot corridor) of the Preferred and Alternate Routes for both the Wellington and Brownhelm Sections are presented as Figures 7-1 and 7-2. These maps depict the transmission line alignments, substation locations, and land use classifications, including vegetative cover. Features within 1,000 feet of the proposed routes were identified from published data and, where accessible, verified by the field ecological survey.

Ecological overview maps of the Brownhelm and Wellington Sections are provided in Figures 8-1 and 8-4, respectively. More detailed maps at 1:2,400 and 1:6,000 scale depicting field-delineated waterbody and wetland features, lakes, ponds, reservoirs, slopes of 12 percent or greater, wildlife areas, nature preserves, and conservation areas within the 2,000-foot corridor are provided as Figures 8-2A through 8-2C (Brownhelm Preferred Route), Figures 8-3A through 8-3C (Brownhelm Alternate Route), Figures 8-5A through 8-5N (Wellington Preferred Route), and Figures 8-6A through 8-6I (Wellington Alternate Route).

(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS

The ecological survey consisting of the 265 to 300-foot wide field survey area of both the Preferred and Alternate Routes of the Brownhelm and Wellington Sections were conducted September 2019 to July 2020. The field survey was preceded by review of published mapping, aerial photography, protected Federal and State-listed species, and ecological information for at least 1,000 feet on either side of the Preferred and Alternate Route centerlines. Map sources included USGS 7.5-minute quadrangle topographic maps, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey maps.

(1) Vegetative Communities, Wetlands, and Streams in Study Area

(a) Vegetative Communities

Vegetative communities and land use types within the Field Survey Area of the Brownhelm and Wellington Sections include agricultural and pasture fields, old fields, early or second growth successional forests, riparian areas, palustrine emergent (PEM) wetlands, palustrine scrub-shrub (PSS) wetlands, palustrine forested (PFO) wetlands, and residential lawns, in addition to the identified waterbodies. Habitat descriptions are provided below. Details on the anticipated impacts from construction of the proposed Project are provided in Section 4906-05-08(B)(3)(a) below and in Tables 8-5A and 8-5B.

(i) Agricultural and Pasture Fields

Portions of both the Preferred and Alternate Routes of the Brownhelm and Wellington Sections cross agricultural and/or pasture fields. Corn and soybeans were observed in most of the crop fields. Livestock pastures dominated by a variety of grazed grass species were also observed. The two dominant grasses observed were tall fescue (*Schedonorus arundinaceus*) and Japanese bristlegrass (*Setaria faberi*).

(ii) Old Field

Herbaceous cover exists in successional old field communities. Old-field plant communities are at the earliest stages of recolonization following disturbance. This community type is typically short-lived (less than 10 years), progressively giving way to shrub and forest communities unless periodically re-disturbed, in which case they remain as fallow fields. Old-field areas are located within much of the Project Area of the Brownhelm and Wellington Sections, especially in inactive pastures, clear cut areas, and within occasionally maintained portions of the power line ROW.

Dominant plant species in the old-field communities included:

- Allegheny blackberry (*Rubus allegheniensis*)
- Giant goldenrod (*Solidago gigantea*)
- Silky dogwood (*Cornus amomum*)
- Canada goldenrod (*Solidago canadensis*)
- Rambler rose (*Rosa multiflora*)
- Broom sedge (*Andropogon virginicus*)
- Fuller’s teasel (*Dipsacus fullonum*)
- Japanese bristlegrass (*Setaria faberi*)
- Yellow foxtail (*Setaria pumila*)
- White clover (*Trifolium pretense*)
- Tall fescue (*Schedonorus arundinaceus*)

(iii) Successional Forests

Upland, early successional or second growth forest are present across portions of the Field Survey Area within the Preferred and Alternate Routes of both the Brownhelm and Wellington Sections.

Dominant canopy species within these forested areas include the following:

- Box elder (*Acer negundo*)
- Red Maple (*Acer rubrum*)
- Sugar Maple (*Acer saccharum*)
- Shagbark hickory (*Carya ovata*)
- American elm (*Ulmus americana*)
- Pin oak (*Quercus palustris*)
- Red oak (*Quercus rubra*)
- American beech (*Fagus grandifolia*)

Dominant understory species include:

- Rambler rose (*Rosa multiflora*)
- Poison ivy (*Toxicodendron radicans*)
- Amur honeysuckle (*Lonicera maackii*)
- Eastern bottlebrush grass (*Elymus hystrix*)

The understory of the various forest communities within the Project Area ranged from open to moderately dense.

(iv) Wetlands

Wetlands were observed and delineated within the proposed Preferred Route and Alternate Routes of the Brownhelm and Wellington Sections. Dominant plant species typically found in wetlands crossed by the Project are listed below.

Dominant plant species observed within PEM wetlands include the following:

- Narrowleaf cattail (*Typha angustifolia*)
- Woolgrass (*Scirpus cyperinus*)
- Reed canary grass (*Phalaris arundinacea*)
- Various Carex spp. (e.g., *C. lurida*, *C. frankii*, *C. lupulina*)
- Common rush (*Juncus effusus*)
- Barnyard grass (*Echinochloa crus-galli*)
- Poverty rush (*Juncus tenuis*)

- American tearthumb (*Persicaria sagittata*)
- Harvest lice (*Agrimonia parviflora*)

Dominant plant species observed within PSS wetlands include the following:

- Black willow (*Salix nigra*)
- Silky dogwood (*Cornus amomum*)
- Green ash (*Fraxinus pennsylvanica*)
- American elm (*Ulmus americana*)
- Creeping Jenny (*Lysimachia nummularia*)
- Reed canary grass (*Phalaris arundinacea*)

Dominant plant species observed within PFO wetlands include the following:

- American elm (*Ulmus americana*)
- Pin oak (*Quercus palustrus*)
- Swamp white oak (*Quercus bicolor*)
- Silver Maple (*Acer saccharinum*)
- Green ash (*Fraxinus pennsylvanica*) (high mortality due to Emerald Ash Borer)
- Silky dogwood (*Cornus amomum*)
- Rambler rose (*Rosa multiflora*)
- Eastern cottonwood (*Populus deltoides*)
- Sensitive fern (*Onoclea sensibilis*)
- Brome-like sedge (*Carex bromoides*)
- Fowl manna grass (*Glyceria striata*)

(v) Residential and Commercial

Residential and/or commercial areas exist within the Brownhelm and Wellington Sections' Preferred and Alternate Route Field Survey Areas. Vegetation identified on residential and commercial properties include a variety of herbaceous grasses and forbs typically found in new field communities. The two dominant grasses observed were tall fescue (*Schedonorus arundinaceus*) and Japanese bristlegrass (*Setaria faberi*). The dominant forb species include common dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), and broadleaf plantain (*Plantago major*). The vegetation on the residential and commercial properties are, for the most part, regularly maintained through mowing.

(vi) Utility ROW

Some linear ROWs are within or adjacent to the proposed Preferred and Alternate Routes of the Brownhelm and Wellington Sections, some of which occur adjacent to roads. These ROWs exist for ATSI's existing transmission lines and local electric distribution lines. Vegetation with tall growth habits can pose a risk to the operation and maintenance of overhead electric transmission lines and are therefore typically removed periodically from the ROW. Vegetation within the existing ROWs are maintained through mowing, mechanical shrub-scrub removal and/or chemical application. Vegetation within upland portions of the maintained ROW consists of herbaceous and shrub-scrub species typically found in old and/or new field communities. The dominant grass species include tall fescue (*Schedonorus arundinaceus*), Japanese bristlegrass (*Setaria faberi*), and deer tongue (*Dichanthelium clandestinum*). The dominant forb species include Canada goldenrod (*Solidago canadensis*), Fuller's teasel (*Dipsacus fullonum*), wingstem (*Verbesina alternifolia*), and hairy aster (*Symphyotrichum* pilosum). Dominant shrub-scrub species include rambler rose (*Rosa multiflora*), Allegheny blackberry (*Rubus allegheniensis*), and Autumn olive (*Elaeagnus umbellata*).

(b) Wetlands

According to the U.S. Army Corps of Engineers (USACE), a wetland is defined as those 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.

ATSI's consultant used the onsite methodology described in the 1987 Technical Report Y-87-1, USACE Wetlands Delineation Manual (USACE, 1987) and subsequent guidance documents including the Regional Supplement to the USACE Wetland Delineation Manual: Northcentral and Northeast Region (USACE, 2012). Additionally, each identified wetland was evaluated in accordance with the Ohio Rapid Assessment Method (ORAM) developed by Ohio Environmental Protection Agency (OEPA, 2001; Mack, 2001). Wetland categorizations were conducted in accordance with the latest quantitative score calibration procedure (OEPA, 2001). To identify whether potential wetlands exist along the Preferred and Alternate Routes of the Brownhelm and Wellington Sections, a desktop study of available resources was performed prior to the field wetland delineations. Additionally, USFWS NWI maps and the NRCS soil survey (USDA NRCS, 2016) and hydric soil list for Lorain County were reviewed for areas within 1,000 feet of the Preferred and Alternate Routes.

(i) Summary of National Wetland Inventory Data

USFWS NWI data, including freshwater wetlands and riverine areas, were mapped within 1,000 feet of the Preferred and Alternate Routes of the Brownhelm and Wellington Sections, and reviewed to guide the field ecological survey as one factor in identifying potential wetland locations (USFWS, 2017). The NWI-mapped areas for the Brownhelm Section are shown on Figures 8-2A through 8-2C and Figures 8-3A through 8-C for the Preferred and Alternate Routes, respectively. The NWI-mapped areas for the Wellington Section are shown on Figures 8-5A through 8-5N and Figures 8-6A through 8-I for the Preferred and Alternate Routes, respectively. Tables 8-1A and 8-1B summarize the NWI data by wetland classification and habitat type. The actual extent and type of field-delineated wetlands along the routes are discussed in the next section.

Table 8-1A. NWI Wetlands within 1,000 Feet of the Preferred and Alternate Routes – Brownhelm Section

Wetland Type	NWI Code	NWI Habitat Type*	Total Number of Each Habitat Type Preferred/ Alternate
Freshwater Emergent Wetland	PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded	0-Preferred 1-Alternate
Freshwater Pond	PUBG	Palustrine Unconsolidated Bottom Intermittently Exposed	1-Preferred 0-Alternate
Freshwater Pond	PUBGx	Palustrine Unconsolidated Bottom Intermittently Exposed Excavated	1-Preferred 1-Alternate
Riverine	R4SBC	Riverine Intermittent Streambed Seasonally Flooded	1-Preferred 1-Alternate
Total Number of Preferred Route NWI Wetlands:			3
Total Number of Alternate Route NWI Wetlands:			3

Notes:
Total number of PEM = 0, PSS = 0, PFO = 1, Pond = 3, Riverine = 2
* USFWS, 2016a

Table 8-1B. NWI Wetlands within 1,000 Feet of the Preferred and Alternate Routes – Wellington

Wetland Type	NWI Code	NWI Habitat Type*	Total Number of Each Habitat Type Preferred/ Alternate
Lake	L1UBH	Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded	1-Preferred 1-Alternate
Freshwater Emergent Wetland	PEM1A	Palustrine Emergent Persistent Temporary Flooded	1-Preferred 2-Alternate
Freshwater Emergent Wetland	PEM1C	Palustrine Emergent Persistent Seasonally Flooded	2-Preferred 1-Alternate
Freshwater Scrub-Shrub and Emergent Wetland	PSS1A/ EM1C	Palustrine Scrub-Shrub Broad-Leaved Deciduous Temporary Flooded/ Emergent Persistent Seasonally Flooded	0-Preferred 1-Alternate
Freshwater Shrub Wetland	PSS1C	Palustrine Scrub-Shrub Broad-Leaved Deciduous Seasonally Flooded	1-Preferred 0-Alternate
Freshwater Forested/Shrub Wetland	PFO1A	Palustrine Forested Broad-Leaved Deciduous Temporary Flooded	1-Preferred 0-Alternate
Freshwater Forested/Shrub Wetland	PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded	9-Preferred 7-Alternate
Freshwater Pond	PUBG	Palustrine Unconsolidated Bottom Intermittently Exposed	11-Preferred 3-Alternate
Freshwater Pond	PUBGx	Palustrine Unconsolidated Bottom Intermittently Exposed Excavated	3-Preferred 3-Alternate
Freshwater Pond	PUBH	Palustrine Unconsolidated Bottom Permanently Flooded	1-Preferred 0-Alternate
Riverine	R2UBH	Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Exposed	2-Preferred 3-Alternate
Riverine	R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded	9-Preferred 6-Alternate
Riverine	R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	7-Preferred 4-Alternate
Total Number of Preferred Route NWI Wetlands:			48
Total Number of Alternate Route NWI Wetlands:			31

Notes:
Total number of Lakes = 2, PEM = 6, PSS = 2, PFO = 17, Pond = 21, Riverine = 31
* USFWS, 2016a

(ii) Field-Delineated Wetlands

Brownhelm Section

A total of five wetlands/wetland complexes, totaling 1.89 acres, were delineated within the Preferred Route Field Survey Area. Two of these wetlands are within the 65-foot ROW of the Preferred Route, totaling 0.48 acre. Within the Alternate Route Field Survey Area, two wetland complexes, totaling 2.89 acres, were delineated. Both wetlands are within the 65-foot ROW of the Alternate Route, totaling 0.54 acre. Detailed information for each wetland is provided in Table 8-2A. The wetlands within the potential disturbance area/ROW are identified in Table 8-2A and further discussed in Section 4906-05-08(B)(3)(b). The field-delineated wetlands for both the Preferred and Alternate Routes are mapped on Figures 8-2A and 8-2C and Figures 8-3A through 8-3C, respectively.

Wellington Section

A total of 60 wetlands/wetland complexes, totaling 11.25 acres, were delineated within the Preferred Route Field Survey Area. Thirty-seven of these wetlands, totaling 4.94 acres, are within the 65 to 100 foot ROW of the Preferred Route. Within the Alternate Route Field Survey Area, 19 wetlands/wetland complexes, totaling 11.02 acres, were delineated. Eleven of these wetlands are within the 65-foot ROW of the Alternate Route, totaling 3.43 acres. Detailed information for each wetland is provided in Table 8-2B. The wetlands where temporary construction impacts are anticipated to be unavoidable are identified in Table 8-2B and further discussed in Section 4906-05-08(B)(3)(b). The field-delineated wetlands for both the Preferred and Alternate Routes are mapped on Figures 8-5A through 8-5N and Figures 8-6A through 8-6I, respectively.

Wellington Substation

No wetlands were delineated within the Wellington Substation expansion area.

Table 8-2A. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Brownhelm Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Preferred Route Wetlands								
Wetland BH-01E	Preferred	8-2 A	PEM	34	Category 2	0.56	0.16	83
Wetland BH-01S	Preferred	8-2 A	PSS	34	Category 2	0.08	0.00	0
Wetland BH-02	Preferred	8-2 A	PEM	18.5	Category 1	0.02	0.00	0
Wetland BH-03E	Preferred	8-2 A	PEM	46.5	Category 2	0.45	0.01	0
Wetland BH-03S	Preferred	8-2 A	PSS	46.5	Category 2	0.71	0.31	216
Wetland BH-04	Preferred	8-2 B	PEM	25	Category 1	0.02	0.00	0
Wetland BH-05	Preferred	8-2 B	PEM	24	Category 1	0.06	0.00	0
					Total[d]	**1.89**	**0.48**	**299**
Alternate Route Wetlands								
Wetland BH-01E	Alternative	8-3 A	PEM	34	Category 2	0.56	0.15	76
Wetland BH-01S	Alternative	8-3 A	PSS	34	Category 2	0.07	0.00	0
Wetland BH-06E	Alternative	8-3 A	PEM	37.5	Category 2	1.74	0.36	0
Wetland BH-06F	Alternative	8-3 A	PFO	37.5	Category 2	0.52	0.03	18
					Total[d]	**2.89**	**0.54**	**94**

Notes:

a Wetland Type: PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested.

b The width of the Field Survey Area was 265 feet on both the Preferred and Alternate Routes.

c The width of the potential disturbance area and the final maintained ROW is planned to be 65 feet.

d Total may vary slightly from the sum of their parts due to rounding.

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Preferred Route Wetlands								
Wetland BW-01	Preferred	8-5 A	PEM	11	Category 1	0.06	0.00	0
Wetland BW-02	Preferred	8-5 B	PEM	25	Category 1	0.05	0.01	0
Wetland BW-03	Preferred	8-5 B	PFO	36	Category 2	0.15	0.00	0
Wetland BW-04	Preferred	8-5 B	PEM	11	Category 1	0.04	0.00	0
Wetland BW-05	Preferred	8-5 C	PEM	17	Category 1	0.04	0.04	0
Wetland BW-06	Preferred	8-5 C	PFO	39	Category 2	0.04	0.00	0
Wetland BW-07	Preferred	8-5 C	PFO	35.5	Category 2	0.08	0.00	0
Wetland BW-08	Preferred	8-5 C	PEM	19	Category 1	0.03	0.01	0
Wetland BW-09	Preferred	8-5 C	PFO	29	Category 1	0.02	0.00	0
Wetland BW-10F	Preferred	8-5 C	PFO	50	Category 2	0.05	0.00	0
Wetland BW-10O	Preferred	8-5 C	POW	50	Category 2	0.05	0.00	0
Wetland BW-11	Preferred	8-5 C	PEM	23	Category 1	0.10	0.07	45
Wetland BW-12	Preferred	8-5 C	PFO	41.5	Category 2	0.03	0.00	0
Wetland BW-13	Preferred	8-5 C	PEM	27	Category 1	0.01	0.00	0
Wetland BW-14E	Preferred	8-5 C	PEM	42	Category 2	0.06	0.06	36
Wetland BW-14F	Preferred	8-5 C	PFO	42	Category 2	0.44	0.23	196
Wetland BW-15E	Preferred	8-5 C	PEM	39	Category 2	0.07	0.07	59

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Wetland BW-15F	Preferred	8-5 C	PFO	39	Category 2	0.12	0.00	0
Wetland BW-16	Preferred	8-5 D	PFO	37	Category 2	0.02	0.00	0
Wetland BW-17E	Preferred	8-5 D	PEM	36.5	Category 2	0.07	0.06	90
Wetland BW-17F	Preferred	8-5 D	PFO	36.5	Category 2	0.09	0.00	0
Wetland BW-18E	Preferred	8-5 D	PEM	11	Category 1	0.33	0.08	55
Wetland BW-18F	Preferred	8-5 D	PFO	11	Category 1	0.12	0.00	0
Wetland BW-19	Preferred	8-5 E	PSS	26	Category 1	0.54	0.38	517
Wetland BW-20	Preferred	8-5 E	PEM	17	Category 1	0.09	0.02	0
Wetland BW-21	Preferred	8-5 E	PFO	32	Category 2	0.16	0.02	0
Wetland BW-22	Preferred	8-5 E	PEM	18	Category 1	0.08	0.08	0
Wetland BW-23	Preferred	8-5 E	PFO	23.5	Category 1	0.05	0.01	11
Wetland BW-24	Preferred	8-5 E	PEM	24	Category 1	0.28	0.18	63
Wetland BW-25E	Preferred	8-5 E	PEM	28	Category 1	<0.01	0.00	0
Wetland BW-25F	Preferred	8-5 E	PFO	28	Category 1	0.00	0.00	0
Wetland BW-26	Preferred	8-5 E	PSS	12.5	Category 1	0.08	0.04	0
Wetland BW-27	Preferred	8-5 E	PSS	10.5	Category 1	0.02	0.01	0
Wetland BW-28	Preferred	8-5 F	PFO	24.5	Category 1	0.01	0.00	0
Wetland BW-29	Preferred	8-5 F	PFO	25.5	Category 1	0.03	0.00	0

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Wetland BW-30	Preferred	8-5 F	PSS	21.5	Category 1	0.01	0.00	0
Wetland BW-31	Preferred	8-5 F	PEM	23	Category 1	<0.01	0.00	0
Wetland BW-32	Preferred	8-5 F	PEM	26	Category 1	0.55	0.37	307
Wetland BW-33	Preferred	8-5 G	PEM	26	Category 1	0.46	0.23	181
Wetland BW-34	Preferred	8-5 G	PEM	19	Category 1	0.01	0.01	11
Wetland BW-35	Preferred	8-5 G	PSS	12.5	Category 1	0.08	0.00	0
Wetland BW-36	Preferred	8-5 G	PSS	12.5	Category 1	<0.01	0.00	0
Wetland BW-37	Preferred	8-5 G	PSS	14.5	Category 1	0.06	0.00	0
Wetland BW-38E	Preferred	8-5 H	PEM	43	Category 2	0.42	0.23	137
Wetland BW-38O	Preferred	8-5 H	POW	43	Category 2	0.55	0.13	95
Wetland BW-39	Preferred	8-5 H	PFO	36.5	Category 2	<0.01	0.00	0
Wetland BW-40	Preferred	8-5 H	PEM	31	Category 2	0.20	0.20	198
Wetland BW-41E	Preferred	8-5 H	PEM	39	Category 2	0.02	0.02	13
Wetland BW-41F	Preferred	8-5 H	PFO	39	Category 2	0.14	0.03	0
Wetland BW-42	Preferred	8-5 H	PFO	40	Category 2	0.04	0.00	0
Wetland BW-43E	Preferred	8-5 H	PEM	30	Category 2	0.08	0.07	49
Wetland BW-43F	Preferred	8-5 H	PFO	30	Category 2	0.06	0.01	5
Wetland BW-44E	Preferred	8-5 I	PEM	44.5	Category 2	0.14	0.14	149

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Wetland BW-44F	Preferred	8-5 I	PFO	44.5	Category 2	0.26	0.02	0
Wetland BW-45	Preferred	8-5 I	PFO	51	Category 2	0.02	0.00	0
Wetland BW-46	Preferred	8-5 I	PEM	29	Category 1	0.01	0.01	16
Wetland BW-47	Preferred	8-5 I	PEM	23	Category 1	0.11	0.11	148
Wetland BW-48	Preferred	8-5 I	PFO	35	Category 2	0.34	0.06	0
Wetland BW-49	Preferred	8-5 I	PEM	23	Category 1	0.13	0.13	159
Wetland BW-50	Preferred	8-5 I	PEM	21	Category 1	0.08	0.08	70
Wetland BW-51	Preferred	8-5 J	PEM	27	Category 1	0.01	0.00	0
Wetland BW-52	Preferred	8-5 J	PEM	22	Category 1	0.05	0.00	0
Wetland BW-53	Preferred	8-5 J	PEM	17	Category 1	0.02	0.01	4
Wetland BW-54E	Preferred	8-5 J	PEM	12.5	Category 1	0.33	0.11	38
Wetland BW-54O	Preferred	8-5 J	POW	12.5	Category 1	0.07	0.00	0
Wetland BW-55	Preferred	8-5 K	PEM	28	Category 1	0.11	0.10	74
Wetland BW-56	Preferred	8-5 K	PEM	28	Category 1	0.05	0.05	53
Wetland BW-57	Preferred	8-5 L	PEM	5	Category 1	0.38	0.31	368
Wetland BW-58	Preferred	8-5 L	PFO	32	Category 2	0.09	0.00	0
Wetland BW-59E	Preferred	8-5 M	PEM	35	Category 2	0.84	0.84	651
Wetland BW-59F	Preferred	8-5 M	PFO	35	Category 2	1.90	0.29	0

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Wetland BW-60	Preferred	8-5 M	PEM	19	Category 1	0.16	0.00	0
					Total[d]	**11.25**	**4.94**	**3,798**
Alternate Route Wetlands								
Wetland BW-61	Alternate	8-6 A	PFO	34.5	Category 2	0.02	0.00	0
Wetland BW-62	Alternate	8-6 A	PEM	22.5	Category 1	0.38	0.05	36
Wetland BW-63	Alternate	8-6 B	PEM	24	Category 1	0.06	0.00	0
Wetland BW-64	Alternate	8-6 B	PEM	27	Category 1	0.04	0.00	0
Wetland BW-65	Alternate	8-6 B	PSS	43.5	Category 2	0.03	0.02	4
Wetland BW-66	Alternate	8-6 C	PFO	44	Category 2	0.11	0.00	0
Wetland BW-67E	Alternate	8-6 D	PEM	25.5	Category 1	0.66	0.16	81
Wetland BW-67F	Alternate	8-6 D	PFO	25.5	Category 1	0.07	0.05	34
Wetland BW-68	Alternate	8-6 D	PEM	20.5	Category 1	0.36	0.06	32
Wetland BW-69E	Alternate	8-6 D	PEM	19.5	Category 1	0.38	0.00	0
Wetland BW-69F	Alternate	8-6 D	PFO	19.5	Category 1	0.03	0.00	0
Wetland BW-70E	Alternate	8-6 D	PEM	37.5	Category 2	3.10	0.69	694
Wetland BW-70F	Alternate	8-6 E	PFO	37.5	Category 2	2.05	1.33	1,098
Wetland BW-71E	Alternate	8-6 E	PEM	29.5	Category 1	0.59	0.07	0
Wetland BW-71F	Alternate	8-6 E	PFO	29.5	Category 1	0.68	0.37	304

Table 8-2B. Delineated Wetlands within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Wetland Name	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Acreage within Field Survey Area[b]	Acreage within Potential Disturbance Area/ROW[c]	Length Crossed by Centerline (feet)
Wetland BW-72	Alternate	8-6 E	PEM	21	Category 1	0.02	0.00	0
Wetland BW-73	Alternate	8-6 E	PFO	39.5	Category 2	0.25	0.01	0
Wetland BW-74	Alternate	8-6 F	PEM	17	Category 1	1.09	0.37	248
Wetland BW-75	Alternate	8-6 F	PEM	17	Category 1	0.04	0.00	0
Wetland BW-76	Alternate	8-6 G	PEM	32.5	Category 2	0.41	0.17	119
Wetland BW-77	Alternate	8-6 G	PEM	18.5	Category 1	0.14	0.02	0
Wetland BW-78	Alternate	8-6 H	PEM	17	Category 1	0.45	0.08	53
Wetland BW-79	Alternate	8-6 H	PEM	17	Category 1	0.07	0.00	0
					Total[d]	**11.02**	**3.43**	**2,703**

Notes:

a Wetland Type: PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested.

b The width of the Field Survey Area was 265 feet on both the Preferred and Alternate Routes.

c The width of the potential disturbance area and the final maintained ROW is planned to be 65 to 100 feet.

d Total may vary slightly from the sum of their parts due to rounding.

(c) Waterbodies

(i) Field-Delineated Streams

Streams and drainage channels were delineated and assessed during the ecological survey of the Preferred and Alternate Routes. Streams with drainage areas greater than 1 square mile or maximum pool depths greater than 40 centimeters were assessed using the OEPA Qualitative Habitat Evaluation Index (QHEI). The QHEI is one measure that is used by OEPA, in association with biotic sampling, to determine a stream’s aquatic life use designation in accordance with the Ohio water quality standards (OEPA, 2012). The QHEI method classifies streams based on their drainage area. Streams that drain greater than or equal to 20 square miles are classified as “larger streams,” while those that drain less than 20 square miles are classified as “headwaters.”

No waterbodies within the Project Area are designated as outstanding state waters, outstanding national resource waters, or Superior High Quality Waters (OEPA, 2017). Field personnel completed the QHEI near the proposed centerline of the transmission line crossing when possible.

Although not a regulatory requirement, the OEPA’s Headwater Habitat Evaluation Index (HHEI) can be used to evaluate streams with a drainage area less than or equal to 1 square mile, and maximum pools depths less than or equal to 40 centimeters (OEPA, 2006). The HHEI is generally used to assess Primary Headwater Habitat (PHWH) streams that typically fall under the classification of first or second-order streams. The HHEI rates a stream based on its physical habitat and uses that information to determine the biological potential of the stream. The physical habitats scored for the HHEI are substrate type, pool depth, and bank full width. Scores for Class I PHWH Streams range from 0 to 29.9; scores for Class II PHWH Streams range from 30 to 69.9; and scores for Class III PHWH Streams range from 70 to 100. A “Modified” qualifier may be added as a prefix to any of these classes if evidence of anthropogenic alterations, such as channelization and bank stabilization, are observed. A higher PHWH class corresponds with a more continuous flow regime. The flow regime determines the physical habitat of the stream and is therefore indicative of the biological communities it can support. Streams with scores between 30 and 69 may be classified as potential rheocrene habitat, depending on substrate type, watershed size, and stream flow. The PHWH class for these potential rheocrene streams is then identified by evaluating the biology (fish, salamanders, and benthic macroinvertebrates). Per ATSI’s consultant’s standard operating procedures, it was not necessary to perform a biotic evaluation, and potential rheocrene streams were listed in Tables 8-3A and 8-3B as “Rheocrene Potential.”

Brownhelm Section

One stream (Stream BH-01) was identified within the Preferred Route Survey Area and is crossed three times by the Preferred Route centerline. Approximately 2,574 linear feet of Stream BH-01 is within the 265-foot wide Preferred Route Field Survey Area and approximately 633 linear feet is within the 65-foot wide ROW. Stream BH-01 was evaluated using the QHEI methodology and was given a narrative rating of warmwater habitat. No streams within the Preferred Route Field Survey Area are designated as outstanding state waters, outstanding national resource waters, or Superior High-Quality Waters (OEPA, 2017). Streams were evaluated as close to the route centerline as possible.

Two streams were identified within the Alternate Route Field Survey Area. One of the two streams (Stream BH-01) is crossed by the Alternate Route centerline, while the other stream (Stream BH-02) is not crossed. The total length of streams within the 265-foot wide Alternate Route Field Survey Area is approximately 620 linear feet, while the total length of streams within the 65-foot wide ROW is approximately 176 linear feet. Stream BH-01 was evaluated using the QHEI methodology and was given a narrative rating of Warmwater habitat. Stream BH-02 was evaluated using the HHEI methodology and was assigned a PHWH class of Modified Class I. No streams within the Alternate Route Field Survey Area are designated as outstanding state waters, outstanding national resource waters, or Superior High-Quality Waters (OEPA, 2017). Streams were evaluated as close to the route centerline as possible.

Streams identified during the ecological survey on the Preferred and Alternate Routes are shown on Figures 8-2A through 8-2C and Figures 8-3A through 8-3C, respectively. Detailed information on each delineated stream is included in Table 8-3A. Aquatic life use designations within the Southwest Ohio Tributaries Basin obtained from OAC 3745-1-09 are also provided (OEPA, 2017). Construction impacts on these features are included in Table 8-3A and further discussed in Section 4906-05-08(B)(3)(c).

Wellington Section

Within the Preferred Route Field Survey Area, 18 streams were identified; 11 of those streams are crossed by the Preferred Route centerline. The total length of streams within the 265 to 300-foot wide Preferred Route Field Survey Area is approximately 11,130 linear feet, while the total length of streams within the 65 to 100-foot-wide ROW is approximately 1,331 linear feet. Within the Preferred Route Survey Area, four of the streams were evaluated using the QHEI methodology, and the other 14 streams were evaluated using the HHEI methodology. No streams within the Preferred Route Field Survey Area are designated as outstanding state waters, outstanding national resource waters, or Superior High-Quality Waters (OEPA, 2017). Streams were evaluated as close to the route centerline as possible.

The total length of streams within the 265-foot wide Alternate Route Survey Area is approximately 4,246 linear feet, while the total length of streams within the 65-foot wide Alternate Route construction ROW is approximately 1,009 linear feet. Four of the streams within the Alternate Route Field Survey Area were evaluated using the QHEI methodology, and the other seven streams were evaluated using the HHEI methodology. No streams within the Alternate Route Field Survey Area are designated Superior High-Quality Waters (OEPA, 2003). Streams were evaluated as close to the route centerline as possible.

Streams identified during the ecological survey on the Preferred and Alternate Routes are shown on Figures 8-5A through 8-5N and Figures 8-6A through 8-6I, respectively. Detailed information on each delineated stream is included in Table 8-3B. Aquatic life use designations within the Southwest Ohio Tributaries Basin obtained from OAC 3745-1-09 are also provided (OEPA, 2017). Construction impacts on these features are included in Table 8-3B and further discussed in Section 4906-05-08(B)(3)(c).

Wellington Substation

No streams were identified within the Wellington Substation expansion area.

Table 8-3A. Streams within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Brownhelm Section

Stream ID Waterbody Name	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline	Length (linear feet) within Field Survey Area[a]	Length (linear feet) within Potential Disturbance Area/ROW[b]
Preferred Route											
Stream BH-01 Quarry Creek	8-2 A	Intermittent	8.5	16	QHEI	66.5	WWH	Good	Y	2,574	633
									Total	**2,574**	**633**
Alternate Route											
Stream BH-01 Quarry Creek	8-3 A	Intermittent	8.5	16	QHEI	66.5	WWH	Good	Y	593	149
Stream BH-02 UNT to Quarry Creek	8-3 B	Ephemeral	1	1	HHEI	15	--	Modified Ephemeral Aquatic	N	27	27
									Total	**620**	**176**

Notes:

[a] The width of the Field Survey Area was 265 feet on both the Preferred and Alternate Routes.

[b] The width of the potential disturbance area and the final maintained ROW is planned to be 65 feet.

UNT = unnamed tributary

WWH = warmwater habitat

Table 8-3B. Streams within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Stream ID Waterbody Name	Figure	Flow Regime	Top of Bank Width (feet)	Max. Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline	Length (linear feet) within Field Survey Area[a]	Length (linear feet) within Potential Disturbance Area/ROW[b]
Preferred Route											
Stream BW-01 UNT to Charlemont Creek	8-5 B	Intermittent	2	15	HHEI	35	--	Modified Small Drainage Warmwater	N	112	0
Stream BW-02 UNT to Charlemont Creek	8-5 B	Intermittent	4	3	HHEI	26	--	Modified Ephemeral Aquatic	N	125	0
Stream BW-03 Charlemont Creek	8-5 C	Perennial	30	20	QHEI	58	WWH	Good	Y	644	66
Stream BW-04 UNT to Charlemont Creek	8-5 C	Intermittent	30	10	HHEI	51	--	Small Drainage Warmwater	Y	377	90
Stream BW-05 UNT to Charlemont Creek	8-5 D	Intermittent	8	5	HHEI	54	--	Modified Small Drainage Warmwater	Y	274	65
Stream BW-06 UNT to Charlemont Creek	8-5 E	Ephemeral	1	3	HHEI	25	--	Modified Ephemeral Aquatic	N	80	0
Stream BW-07 UNT to Charlemont Creek	8-5 E	Intermittent	4	10	HHEI	49	--	Modified Small Drainage Warmwater	Y	266	65
Stream BW-08 UNT to Charlemont Creek	8-5 E	Ephemeral	1	1	HHEI	17	--	Modified Ephemeral Aquatic	N	1,548	0

Table 8-3B. Streams within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Stream ID Waterbody Name	Figure	Flow Regime	Top of Bank Width (feet)	Max. Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline	Length (linear feet) within Field Survey Area[a]	Length (linear feet) within Potential Disturbance Area/ROW[b]
Stream BW-09 UNT to Charlemont Creek	8-5 E	Intermittent	2	5	HHEI	36	--	Modified Small Drainage Warmwater	N	1,525	0
Stream BW-10 UNT to Charlemont Creek	8-5 F	Ephemeral	3	3	HHEI	38	--	Modified Small Drainage Warmwater	Y	321	67
Stream BW-11 UNT to Charlemont Creek	8-5 F	Intermittent	9	12	QHEI	52	--	Modified Small Drainage Warmwater	Y	3,714	143
Stream BW-12 UNT to Charlemont Creek	8-5 G	Intermittent	3	4	HHEI	27	--	Modified Ephemeral Aquatic	N	40	0
Stream BW-13 UNT to Charlemont Creek	8-5 H	Intermittent	8	6	HHEI	53	--	Spring Water	Y	434	68
Stream BW-14 UNT to Wellington Creek	8-5 J	Perennial	15	20	QHEI	53.25	--	Fair	Y	361	130
Stream BW-15 UNT to Wellington Creek	8-5 J	Ephemeral	3	1	HHEI	23	--	Modified Ephemeral Aquatic	Y	96	96
Stream BW-16 UNT to Wellington Creek	8-5 J	Ephemeral	3	1	HHEI	26	--	Modified Ephemeral Aquatic	Y	644	288

Table 8-3B. Streams within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Stream ID Waterbody Name	Figure	Flow Regime	Top of Bank Width (feet)	Max. Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline	Length (linear feet) within Field Survey Area[a]	Length (linear feet) within Potential Disturbance Area/ROW[b]
Stream BW-17 UNT to Wellington Creek	8-5 J	Ephemeral	2	1	HHEI	26	--	Modified Ephemeral Aquatic	N	76	31
Stream BW-18 Wellington Creek	8-5 K	Perennial	30	40	QHEI	50	--	Fair	Y	493	222
									Total	**11,130**	**1,331**
Alternate Route											
Stream BW-19 UNT to Charlemont Creek	8-6 A	Ephemeral	2	0	HHEI	19	--	Modified Ephemeral Aquatic	N	107	0
Stream BW-20 UNT to Charlemont Creek	8-6 A	Intermittent	2.5	10	HHEI	54	--	Modified Small Drainage Warmwater	Y	880	113
Stream BW-21 UNT to Charlemont Creek	8-6 B	Intermittent	5	3	HHEI	32	--	Modified Small Drainage Warmwater	Y	215	178
Stream BW-22 UNT to Charlemont Creek	8-6 B	Perennial	3	6	QHEI	47	--	Fair	Y	507	188
Stream BW-23 UNT to Charlemont Creek	8-6 B	Ephemeral	3	1	HHEI	16	--	Ephemeral Aquatic	N	40	0
Stream BW-24 UNT to Charlemont Creek	8-6 B	Perennial	18	20	QHEI	59	--	Good	Y	309	74

Table 8-3B. Streams within the Preferred and Alternate Route Environmental Field Survey Area and Potential Disturbance Area/ROW – Wellington Section

Stream ID Waterbody Name	Figure	Flow Regime	Top of Bank Width (feet)	Max. Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline	Length (linear feet) within Field Survey Area[a]	Length (linear feet) within Potential Disturbance Area/ROW[b]
Stream BW-25 UNT to Charlemont Creek	8-6 B	Ephemeral	2.5	1	HHEI	18	--	Ephemeral Aquatic	N	80	0
Stream BW-26 Charlemont Creek	8-6 C	Perennial	25	42	QHEI	62.5	WWH	Good	Y	1,022	131
Stream BW-27 UNT to Charlemont Creek	8-6 C	Ephemeral	2.5	3	HHEI	29	--	Modified Ephemeral Aquatic	N	25	0
Stream BW-28 Wellington Creek	8-6 G	Perennial	20	30	QHEI	45.5	--	Fair	Y	867	259
Stream BW-29 UNT to Wellington Creek	8-6 H	Intermittent	1.5	5	HHEI	41	--	Modified Small Drainage Warmwater	Y	192	65
									Total[c]	**4,246**	**1,009**

Notes:

[a] The width of the Field Survey Area was 265 feet on both the Preferred and Alternate Routes.

[b] The width of the potential disturbance area and the final maintained ROW is planned to be 65 feet.

[c] Total may vary slightly from the sum of their parts due to rounding.

UNT = unnamed tributary

WWH = warmwater habitat

(ii) Lakes, Ponds, and Reservoirs

Brownhelm Section

No ponds, major lakes, or reservoirs were observed along the proposed Preferred or Alternate Routes.

Wellington Section

No major lakes or reservoirs were observed within the proposed Preferred or Alternate Routes' survey corridors. Two ponds totaling 0.58 acre were identified during the field evaluation along the Preferred Route Field Survey Area. One pond totaling 0.11 acre was identified during the field evaluation along the Alternate Route Field Survey Area. Ponds within the Field Survey Area are shown on Figures 8-5A through 8-5N and Figures 8-6A through 8-6I and are summarized in Table 8-4.

Impacts to ponds from construction, operation, or maintenance of the proposed transmission line are not anticipated. Best management practices (BMPs) to control soil erosion and sedimentation (for example, using silt fencing and filter sock as appropriate during construction to minimize runoff siltation) will be implemented.

Table 8-4. Delineated Ponds within the Preferred Route and Alternate Route Environmental Field Survey Area – Wellington Section

Feature Name	Route	Figure	Acreage within Field Survey Area	Acreage within ROW [a]	Linear Feet Crossed by Centerline
Preferred Route Ponds					
Pond BW-01	Preferred	8-5C	0.01	0	0
Pond BW-02	Preferred	8-5E	0.57	0.07	3
		Total	**0.58**	**0.07**	**3**
Alternate Route Ponds					
Pond BW-03	Alternate	8-6A	0.11	0.06	23
		Total	**0.11**	**0.06**	**23**

Notes:
a "0" indicates the pond is not within the ROW.

(2) Map of Facility, Right-of-Way, and Delineated Resources

Detailed maps at 1:6,000 scale depicting the delineated water features, Field Survey Area, and proposed ROW for the Preferred and Alternate Routes are provided as Figures 8-2A through 8-2C and Figures 8-3A through 8-3C, respectively.

(3) Construction Impacts on Vegetation and Surface Waters

(a) Construction Impacts on Vegetation

The construction impacts on woody and herbaceous vegetation along both the Preferred and Alternate Routes will be limited to the initial clearing of vegetation within the 65 to 100-foot ROW for the proposed transmission line and access roads. Specific locations for access roads will be identified at the time of ATSI transmission line easement acquisition process. Trees adjacent to the proposed 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 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. The approximate vegetation impacts, based on GIS analysis, along the Preferred and Alternate Route ROWs are provided in Table 8-5A (Brownhelm) and Table 8-5B (Wellington).

Table 8-5A. Approximate Vegetation Impacts along the Potential Disturbance Area/ROW – Brownhelm Section

Land Use Type	Length of Route (in feet)	Length of Route (in miles)	Acreage within ROW
Preferred Route			
Agricultural	654	0.1	1.2
Herbaceous (Old Field)	561	0.1	1.4
Residential	307	0.1	0.7
Utility ROW	2,876	0.5	3.9
Woodlot	1,290	0.2	1.4
Delineated Wetland	299	0.1	0.5
Alternate Route			
Agricultural	2,540	0.5	2.9
Herbaceous (Old Field)	0	0.0	0
Residential	442	0.1	0.6
Utility ROW	1,553	0.3	3.5
Woodlot	2,038	0.4	2.4
Delineated Wetland	94	0.0	0.5

Table 8-5B. Approximate Vegetation Impacts along the Potential Disturbance Area/ROW – Wellington Section

Land Use Type	Length of Route (in feet)	Length of Route (in miles)	Acreage within ROW
Preferred Route			
Agricultural	319	0.1	8.5
Herbaceous (Old Field)	0	0.0	0.2
Residential	0	0.0	0.1
Utility ROW	27,339	5.2	30.2
Woodlot	49	0.0	2.4
Delineated Wetland	3,798	0.7	4.9
Alternate Route			
Agricultural	10,244	1.9	15.3
Herbaceous (Old Field)	1,168	0.2	1.6
Residential	1,282	0.2	1.9
Utility ROW	403	0.1	0.6
Woodlot	4,502	0.9	7.3
Delineated Wetland	2,703	0.5	3.4

(b) Construction Impacts on Wetlands

Brownhelm Preferred Route: During wetland and waterbody delineations, two wetlands were identified along the Preferred Route within the proposed ROW, totaling 0.48 acre. The delineated wetlands are shown on Figures 8-2A through 8-2C. Detailed information about each feature can be found in Table 8-2A in Section 4906-05-08(B)(b)(ii). The two wetlands are crossed by the Preferred Route centerline totaling 299 linear feet. Impacts to the wetlands would be avoided by placing transmission line structures outside of wetland boundaries, where practical. Where temporary construction access through a wetland cannot be avoided, the crossing would occur during dry conditions or protective construction matting would be used to minimize impacts from construction vehicles.

Wetland ORAM categories delineated in the Brownhelm Preferred Route ROW are detailed below:

- Category 1 wetlands: No Category 1 wetlands would be crossed; therefore, no construction impacts are anticipated.
- Category 2 wetlands: Two Category 2 wetlands with ORAM scores of 34 and 46.5 were identified within the ROW, totaling 0.48 acre. One approximately 0.31-acre PSS wetland would be impacted during construction.

- Category 3 wetlands: No Category 3 wetlands would be crossed; therefore, no construction impacts are anticipated.

Brownhelm Alternate Route: During wetland and waterbody delineations, two wetlands were identified along the Alternate Route ROW, totaling 0.54 acre within the ROW. The delineated wetlands are shown on Figures 83A through 8-3C. Detailed information about each feature can be found in Table 8-2A in Section 4906-05-08(B)(b)(ii). The two wetlands are crossed by the centerline of the Alternate Route, totaling 94 linear feet. If this route were selected for construction, impacts to wetlands would be avoided by placing transmission line structures outside wetland boundaries where practical. Where temporary construction access through a wetland cannot be avoided, the crossing would occur during dry conditions or matting would be used to minimize impacts.

Wetland ORAM categories delineated in the Brownhelm Alternate Route ROW are detailed below:

- Category 1 wetlands: No Category 1 wetlands would be crossed; therefore, no construction impacts are anticipated.
- Category 2 wetlands: Two Category 2 wetlands with ORAM scores of 34 and 37.5 were identified within the proposed Alternate ROW, totaling 0.54 acre. Approximately 0.03-acre of PFO wetland would be impacted during construction.
- Category 3 wetlands: No Category 3 wetlands would be crossed; therefore, no construction impacts are anticipated.

Wellington Preferred Route: During wetland and waterbody delineations, 37 wetland/wetland complexes were identified along the Preferred Route within the proposed ROW, totaling 4.94 acres within the ROW. The delineated wetlands are shown on Figures 8-5A through 8-5N. Detailed information about each feature can be found in Table 8-2B in Section 4906-05-08(B)(b)(ii). Of these wetlands, 26 are crossed by the Preferred Route centerline, totaling 3,798 linear feet. Impacts to the wetlands would be avoided by placing transmission line structures outside of wetland boundaries, where practical. Where temporary construction access through a wetland cannot be avoided, the crossing would occur during dry conditions or protective construction matting would be used to minimize impacts from construction vehicles.

Wetland ORAM categories delineated in the Wellington Preferred Route ROW are detailed below:

- Category 1 wetlands: Twenty-five Category 1 wetlands with ORAM scores ranging from 5 to 29 were identified within the ROW, totaling 2.44 acres. Approximately 0.43 acre of PSS wetlands and 0.01 acre of PFO wetlands would be impacted during construction.
- Category 2 wetlands: Twelve Category 2 wetlands with ORAM scores ranging from 30 to 44.5 were identified within the ROW, totaling 2.49 acres. Approximately 0.66 acre of PFO wetlands would be impacted during construction.
- Category 3 wetlands: No Category 3 wetlands would be crossed; therefore, no construction impacts are anticipated.

Wellington Alternate Route: During wetland and waterbody delineations, 11 wetland/wetland complexes were identified along the Alternate Route ROW, totaling 3.43 acres. The delineated wetlands are shown on Figures 86A through 8-6I. Detailed information about each feature can be found in Table 8-2B in Section 4906-05-08(B)(b)(ii). Nine wetlands are crossed by the centerline of the Alternate Route, totaling 2,703 linear feet. If this route were selected for construction, impacts to wetlands would be avoided by placing transmission line structures outside wetland boundaries where practical. Where temporary construction access through a wetland cannot be avoided, the crossing would occur during dry conditions or matting would be used to minimize impacts.

Wetland ORAM categories delineated in the Wellington Alternate Route ROW are detailed below:

- Category 1 wetlands: Seven Category 1 wetlands with ORAM scores ranging from 17 to 29.5 were identified within the proposed ROW, totaling 1.22 acres. Approximately 0.05 acre of PFO wetland would be impacted during construction.
- Category 2 wetlands: Four Category 2 wetlands with ORAM scores ranging from 32.5 to 43.5 were identified within the proposed ROW, totaling 2.21 acres. Approximately 0.02 acre of PSS wetland and 1.34 acres of PFO wetlands would be impacted during construction.
- Category 3 wetlands: No Category 3 wetlands would be crossed; therefore, no construction impacts are anticipated.

Through appropriate planning and permitting, care will be taken near wetlands to avoid or minimize filling and sedimentation during construction. ATSI will avoid the placement of poles within wetlands to the extent practical. Selective clearing will be required to remove specific types of woody vegetation in wetlands that might impede construction or interfere with operation of the transmission line. Where wooded or forested wetlands occur within the ROW, the trees will be removed.

To minimize soil erosion and sedimentation during construction, BMPs, such as use of silt fences and construction matting, will be implemented as required during construction. Sedimentation potential at wetlands is unlikely because of the plans for pole placement outside of wetlands, and the fact that construction equipment will only cross wetlands if necessary, and will do so using construction matting if wet conditions require.

Disturbance of soils in wetland areas during construction will be minimized. Placement of permanent fill material in wetland areas will be avoided to the extent practical. Although not anticipated, if it is necessary to place a pole or guy wires within a wetland, they will be accessed using construction matting if wet conditions exist at the time of construction. No excavation other than the boring or excavation of a hole for pole installation will be performed within wetland areas. If pole placement is required within a wetland, no additional fill will be placed in the wetlands beyond the placement of the pole and borehole backfill.

Wetland areas will be clearly staked before the commencement of any clearing to minimize incidental vehicle impacts. Other than the remote possibility of pole locations within wetlands discussed above, operation of heavy mechanized equipment is not planned within any identified wetland areas, although some construction equipment may need to cross wetland areas on construction matting if wet conditions exist at the time. Woody vegetation in wetlands will be hand-cut by chain saws or other non-mechanized techniques. When necessary, rubber-wheeled vehicles, or vehicles equipped with tracks, will be used to remove vegetation debris. ATSI will perform all construction work in accordance with the conditions and requirements of regulatory permits obtained for the Project.

(c) Construction Impacts on Waterbodies

ATSI 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 or have the potential to interfere with safe construction and operation of the line. No streams will be filled or permanently impacted. Some streams may have to be crossed by construction vehicles. Exact pole locations have not been fully determined although preliminary locations have been identified. Access paths to proposed pole locations will be evaluated when more detailed engineering is completed and as landowner negotiations progress. If a new stream crossing is necessary, the Applicant will use temporary culverts or temporary access bridge methods.

Culvert stream crossings may be proposed for crossing marginal quality perennial, ephemeral, and intermittent streams with a drainage watershed of less than 1 mile. These crossings may be removed or remain in place to provide maintenance access to the line (critical if service is to be reliable). All necessary permits will be secured prior to installation.

- 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 controlled to minimize from flowing from the access road directly into the stream. Diversions and swales will be used to direct runoff to stormwater management locations. Silt fence will be used as needed according to local topographic conditions.
- 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.
- There will be enough culvert pipes to cross the stream completely with no more than a 12-inch space between each one.
- Stone, rock, or aggregate of Ohio Department of Transportation 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 and authorized within environmental permits. 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 as appropriate.

Temporary access bridges or culvert stream crossings may be used for high quality perennial, ephemeral, and intermittent streams and streams with a drainage watershed greater than 1 square mile (or possibly less in some cases).

- 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 flowing from the access road directly into the stream. Diversions and swales will be used to direct runoff to stormwater management locations. Silt fence will be used as needed according to local topographic conditions.
- Bridges will be constructed to span the entire channel. If the channel width exceeds 8 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 8 feet of span width. No footings, piers, or supports will be allowed for spans of less than 8 feet.
- No fill other than clean stone, free from soil, will be placed within the stream channel.

These crossings will be addressed in the Project stormwater pollution prevention plan (SWPPP). Some of the access routes may be left in place for maintenance activity. Details regarding proposed access road stream crossing methods will be provided to the OPSB separately, if deemed necessary.

Impacts to ponds are not anticipated by the construction, operation, or maintenance of the proposed transmission line. BMPs, including utilization of silt fence or filter sock, will be used as appropriate during construction to minimize runoff siltation.

(4) Operation and Maintenance Impacts on Vegetation and Surface Water

During operation of the transmission line along either of the proposed 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 65 to 100-foot-wide transmission line ROW is not expected to result in a significant environmental impact to the vegetation in these types of areas.

The potential impacts on woody and herbaceous vegetation along either of the proposed 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.

ATSI 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.

(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. Future maintenance activities will be implemented in accordance with all applicable regulations.

(a) Site Restoration and Soil Stabilization

A SWPPP will be developed specifically for the Project and specified BMPs will be implemented during construction to control erosion and sedimentation. Areas where soil has been disturbed will be seeded and mulched to prevent soil erosion and sedimentation. 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. If any unanticipated significant disturbance occurs in wetlands, topsoil will be segregated and replaced so that the existing seed banks will be allowed to revegetate the areas initially. 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 ROW, prevent erosion, and promote habitat diversity.

Construction access routes and staging areas will be selected to minimize impacts to wetlands and streams to the extent practical. Following construction, pole locations, material storage sites, and temporary access roads will be seeded with a suitable grass seed mixture as specified in the SWPPP for restoring these disturbed areas.

(b) Contingency Plan Stream and Wetland Crossings

The Project does not include a stream or wetland crossing by horizontal direction drill. Therefore, a detailed frac-out contingency plan will not be required for the Project.

(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 prior to the commencement of any clearing to minimize incidental impacts. BMPs such as utilization of silt fences and construction matting will be implemented as required during construction.

(d) Procedures for Inspection and Repair of Erosion Control Measures

Procedures for inspection and repair of erosion control measures, especially after rainfall events will be outlined in the SWPPP.

(e) Stormwater Runoff Measures

BMPs, including utilization 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. Maintenance cutting of woody vegetation in wetland areas would be 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. ATSI 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

ATSI will not conduct mechanized clearing within 25 feet of any stream and will only clear those trees in this area that are tall enough to or have the potential to interfere with safe and reliable construction and 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 and reliable 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 managed in accordance with applicable permit requirements.

(h) Expected Use of Herbicides

Herbicide use on the Project will be in accordance with applicable State and Federal regulations and will be applied in accordance with the manufacturer instructions, which include requirements related to the suitability of a particular herbicide for use near surface water. Only appropriate mixtures and selective methods of application including low-volume foliar and cut stump treatment will be used to support the construction of the Project. The application of a stump herbicide treatment consists of applying herbicide to the cambium layer of the stump and associated root flares. A low-volume foliar application method targets specific incompatible vegetation by applying the herbicide directly on the foliage of the target vegetation, while minimizing potential overspray.

The herbicides used during construction of the Project work on enzymes found only within plants, not people or animals. These compounds enter through leaves, stems, and stumps and control plant growth from the inside of the plant. The products used have undergone years of testing and will be used only as approved by appropriate government agencies. The U.S. Environmental Protection Agency (EPA) approves such products for use only after determining that they will not adversely affect human health or the environment when properly applied. The crews that apply herbicides will follow strict usage guidelines in accordance with the labeling and application requirements. Workers who apply herbicides must hold a pesticide applicator license from the state of Ohio or work under the direct supervision of a certified applicator.

(C) LITERATURE SURVEY OF PLANT AND ANIMAL LIFE POTENTIALLY AFFECTED

The Project Area's Brownhelm and Wellington Sections are primarily situated in a rural setting with few residences located on typically larger lots. The developed areas are dominated by residences, pastures, agricultural fields, and existing utility ROW. The remaining areas are mostly comprised of upland and wetland forest. Both the Preferred and Alternate Routes have potential habitat for wildlife species for each of the Brownhelm and Wellington sections. Lists of protected species are typically based on their range within Lorain County, as reported in ODNR and USFWS county species distribution lists (ODNR-DOW, 2020; USFWS, 2018). A summary of Federal and State-listed plant and animal species potentially found in Lorain County, Ohio, can be found in Table 8-6. Lists of commercial and recreational species were created utilizing professional experience, wildlife sightings, and the Ohio Department of Natural Resources - Division of Wildlife (ODNR-DOW) 2019-2020 Hunting and Trapping Regulations (ODNR-DOW, 2019). Agency coordination has been completed for both the Brownhelm and Wellington Sections of the Project. Details regarding protected species specific to the Project vicinity can be found below. 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) Project Vicinity Species Descriptions

(a) Protected Species

Brownhelm Section

A consultation request was submitted to the USFWS on November 6, 2019, and a response was received on November 15, 2019, regarding the Project preferred route within the Brownhelm section. ATSI has proposed seasonal tree clearing to be conducted between October 1 and

March 31 to avoid impact to Indiana bat and Northern Long-Eared bat. Based on the submitted project details and the proposed seasonal tree clearing restrictions, USFWS concluded that they do not anticipate any impact to federally endangered, threatened, proposed, or candidate species.

A consultation request was submitted to the ODNR-DOW on November 6, 2019, and a response was received on December 17, 2019, regarding the project preferred route within the Brownhelm section. ODNR-DOW states the project is within range of the State-endangered Indiana bat and requests conservation of trees where possible and adherence to seasonal clearing restrictions in the event trees must be cut. ATSI plans to adhere to seasonal clearing restrictions as stated above. Additionally, ODNR-DOW states the Project section is within range of the Ohio lamprey, lake sturgeon, channel darter, American eel, and the bigmouth shiner. ATSI will refrain in-water work within any perennial streams and therefore ODNR-DOW stated this project is not likely to impact these species. The Brownhelm Section is also within range of the State-threatened spotted and Blanding's turtles, yet ODNR-DOW states that due to the project habitat and type of work proposed, impact to this species is not likely. Lastly, the Project section is within range of the Sandhill crane, a State-endangered bird. ODNR-DOW states that due to the project habitat and type of work proposed, impact to this species is not likely.

Once the final route is approved, ATSI's consultant will conduct an additional review of the habitat along the route, based on observations recorded during the completed ecological survey, and coordinate with USFWS and ODNR-DOW for additional survey plans, if necessary.

Wellington Section

A consultation request was submitted to the USFWS on March 4, 2020, and a response was received on March 20, 2020, regarding the Project Preferred Route of the Wellington section of the Project. ATSI has proposed seasonal tree clearing to be conducted between October 1 and March 31 to avoid impact to Indiana bat and Northern Long-Eared bat. Based on the submitted project details and the proposed seasonal tree clearing restrictions, USFWS concluded that they do not anticipate any impact to federally endangered, threatened, proposed, or candidate species.

A consultation request was submitted to ODNR-DOW on March 4, 2020, and a response was received on April 27, 2020, regarding the project preferred route within the Wellington section. ODNR-DOW states the project is within range of the State-endangered Indiana bat and requests conservation of trees where possible and adherence to seasonal clearing restrictions in the event trees must be cut. ATSI plans to adhere to seasonal clearing restrictions as stated above. Additionally, ODNR-DOW states the Project section is within range of the Ohio lamprey, lake sturgeon, channel darter, American eel, and the bigmouth shiner. ATSI will refrain in-water work within any streams and therefore is not likely to impact these species. The Wellington Section is also within range of the State-threatened spotted and Blanding's turtles, yet ODNR-DOW states that due to the project habitat and type of work proposed, impact to these species is not likely. The Project section is within range of the sandhill crane, a State-endangered bird. ODNR-DOW states that if its habitat (grassland, prairie, or wetland) will be impacted, construction should occur outside of its nesting period of April 1 to September 1. This Project section is within range of the upland sandpiper, a State-endangered bird. ODNR-DOW states that if any type of dry grassland will be impacted, construction should be avoided during its nesting period, April 15 to July 31. The Project section is within range of the northern harrier, a State-endangered bird. ODNR-DOW states that if large marshes or grasslands will be impacted, construction should not occur from May 15 to August 1 to avoid disturbing the nesting birds.

Once the final route is approved and response from USFWS has been received, ATSI's consultant will conduct an additional review of the habitat along the route, based on observations recorded during the completed ecological survey, and coordinate with USFWS and ODNR-DOW for additional survey plans, if necessary.

ATSI will utilize an approximately 65 to 100-foot-wide permanent ROW for the Project, as well as approximately 25 feet temporary ROW for access roads, to allow for safe and reliable construction and operation of the transmission line and prevent encroachment. ATSI will not conduct mechanized clearing within 25 feet of any stream or wetland and will only clear (using hand cutting techniques) those trees in ecologically sensitive areas that are tall enough to have the potential to interfere with safe construction and reliable operation of the transmission line.

Table 8-6. Listed Species in the Project County (Lorain)

Common Name (Species Name) [a, b, c]	Federal Status [a, b]	State Status [b, c]	General Habitat Notes	Recorded Location within Project Vicinity	Potential Habitat in Project Area
Vertebrate Animals					
Indiana bat (*Myotis sodalis*)	Endangered	Endangered	Hibernacula = Caves and mines Maternity and foraging habitat = small stream corridors with well-developed riparian woods and upland forests. [a]	Presence assumed wherever suitable habitat occurs. [d] Brownhelm Section within species vicinity.	Yes
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Threatened	Hibernates in caves and mines; swarms in surrounding wooded areas in autumn. During late spring and summer, roosts and forages in upland forests. [a]	Presence assumed wherever suitable habitat occurs. [d] Brownhelm Section within species vicinity.	Yes
Sandhill crane (*Grus canadensis*)		Threatened	Wetland dependent species roost in standing water and wet lowlands. Large shallow wetland meadow, marsh, or bog required for breeding. May use agricultural fields for wintering. [e]	Brownhelm Section within species vicinity.	Potentially
Upland sandpiper (*Bartramia longicauda*)		Endangered	Utilize various types of grass habitat for nesting including native or cultivated grasses, hayfields, and pastures. [e]	Brownhelm Section within species vicinity.	Yes
Northern harrier (*Circus cyaneus*)		Endangered	Large marshes and grasslands (ODNR letter)	No records returned	Yes
Red knot (*Calidris canutus rufa*)	Threatened		Present in Ohio during spring and fall migration. [a]	No records returned	Potentially

Table 8-6. Listed Species in the Project County (Lorain)

Common Name (Species Name) [a, b, c]	Federal Status [a, b]	State Status [b, c]	General Habitat Notes	Recorded Location within Project Vicinity	Potential Habitat in Project Area
Piping plover (*Charadrius melodus*)	Endangered	Endangered	No longer breeds in Ohio, now only a migrant species. Prefer sandy beaches, but migrants use large mudflats. [e]	No records returned	No
Lark sparrow (*Chondestes grammacus*)		Endangered	Utilize grass habitat with shrubs as well as patches of bare soil for nesting in summer months. [e]	No records returned	Yes
Trumpeter swan (*Cygnus buccinator*)		Threatened	Found in large marshes or wetland with emergent vegetation in the shallows for grazing. [e]	No records returned	Potentially
Kirtland's warbler (*Dendroica kirtlandii*)	Endangered		Known to migrate along the Lake Erie shoreline counties in April-May and August-October. [a]	No records returned	Potentially
Least bittern (*Ixobrychus exilis*)		Threatened	Dense emergent marshlands or wetlands. [e]	Wellington Section within species vicinity.	Potentially
Barn owl (*Tyto alba*)		Threatened	Hunt over open grasslands and nest in hollow trees or manmade structures. [e]	No records returned	Potentially
Lake sturgeon (*Acipenser fulvescens*)	Species of Concern	Endangered	Found in large bodies of water yet dependent on much smaller tributaries for spawning. [e]	No records returned	Potentially
Ohio lamprey (*Ichthyomyzon bdellium*)		Endangered	Larvae in small streams, immature adults parasitize other fish species in larger rivers. [f]	No records returned	No

Table 8-6. Listed Species in the Project County (Lorain)

Common Name (Species Name) [a, b, c]	Federal Status [a, b]	State Status [b, c]	General Habitat Notes	Recorded Location within Project Vicinity	Potential Habitat in Project Area
American eel (*Anguilla rostrata*)		Endangered	Lives in fresh or brackish water as an adult and then migrates into the ocean to spawn. [g]	No records returned	No
Bigmouth shiner (*Notropis dorsalis*)		Threatened	Found in pools with sandy substrate within the Rocky and Black River drainage areas primarily. [e]	Wellington Section within species vicinity.	Potentially
Spotted gar (*Lepisosteus oculatus*)		Endangered	Found in clear waterbodies such as lakes, backwaters, rivers and permanent swamps/marshes. Species requires abundant vegetations within aquatic habitat. [e]	No records returned	No
Channel darter (*Percina copelandi*)		Threatened	Found in large, coarse sand or fine gravel bars in large rivers. [e]	No records returned	No
Blanding's turtle (*Emydoidea blandingii*)		Threatened	Mostly aquatic utilizing ponds, marshes, wetland meadows, lakes, and forested swamps. May be found on land traveling between aquatic habitats. [e]	Brownhelm Section within species vicinity.	Potentially
Spotted turtle (*Clemmys guttata*)		Threatened	Prefers fens, marshes, and bogs, yet will also inhabit, meadows, wet prairies, pond edges, and stagnant waters in small streams and ditches. [e]	Brownhelm Section within species vicinity.	Potentially
Invertebrate Animals					
Eastern pondmussel (*Ligumia nasuta*)		Endangered	Found in lakes, ponds, and slackwater areas of canals, streams, and rivers. Prefers fine sand or mud substrates. [h]	No records returned	Potentially

Table 8-6. Listed Species in the Project County (Lorain)

Common Name (Species Name) [a, b, c]	Federal Status [a, b]	State Status [b, c]	General Habitat Notes	Recorded Location within Project Vicinity	Potential Habitat in Project Area
Black sandshell (*Ligumia recta*)		Threatened	Can occur in medium to large rivers with swift current and gravel or firm sand substrate. [i]	No records returned	No
Threehorn wartyback (*Obliquaria reflexa*)		Threatened	Found in large rivers in sand or gravel; may be locally abundant in impoundments. [j]	No records returned	No
Plants					
Common oak fern (*Gymnocarpium dryopteris*)		Endangered	Mesic woods and slopes, often with hemlock. [k]	No records returned	Potentially
Ground juniper (*Juniperus communis*)		Endangered	Sandy shores, dunes, gravelly banks, oak-hickory woods, pastures, and old fields. [k]	No records returned	Yes
American water-milfoil (*Myriophyllum sibiricum*)		Endangered	Ponds, lakes, and slow-moving streams. [k]	No records returned	Yes
Necklace sedge (*Carex projecta*)		Threatened	Wet meadows, streambanks, clearings in wet woods, thickets. [k]	No records returned	Yes
Rock harequin (*Corydalis sempervirens*)		Threatened	Well-drained openings or clearings. [k]	No records returned	Yes
Lindheimer's panic grass (*Dichanthelium lindheimeri*)		Threatened	Gravelly, open, and moist shorelines. [k]	No records returned	No

Table 8-6. Listed Species in the Project County (Lorain)

Common Name (Species Name) [a, b, c]	Federal Status [a, b]	State Status [b, c]	General Habitat Notes	Recorded Location within Project Vicinity	Potential Habitat in Project Area
Sharp-glumed manna grass (*Glyceria acutiflora*)		Threatened	Shallow water in ponds or swamps. [k]	No records returned	Yes
Yellow vetchling (*Lathyrus ochroleucus*)		Threatened	Upland woodlots and slopes, thickets, and rocky banks. [k]	No records returned	Yes
Cow-wheat (*Melampyrum lineare*)		Threatened	Along riverbanks and rocky oak woods. [k]	No records returned	Potentially
Bushy aster (*Symphyotrichum dumosum*)		Threatened	Wet meadows, scrubby fields, and thickets with sandy soil. [k]	No records returned	Potentially

a USFWS, 2018
b ODNR-DOW, 2020
c ODNR-DOW, 2012c
d USFWS, 2016b
e ODNR-DOW, 2012a
f USDA FS, 2005
g USFWS, 2020
h Bogan, 2017
i IDNR, 2014
j Marietta College, 2010
k ODNR, 2020

(b) Commercial Species

The commercially important species along the proposed routes consist of those hunted or trapped for fur or other byproducts, including the following species. This information was obtained from ODNR-DOW Species Guide Index (ODNR-DOW, 2012a).

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 the habitat present along the routes, beavers could potentially inhabit only a few locations. Evidence of beaver-chewed trees has not been observed within the Project Area.

Coyote (*Canis latrans*): Historically, coyotes prefer open territory, but in Ohio, they have adapted to various habitat types. 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 yet was not observed during field investigations.

Gray Fox (*Urocyon cinereoegentus*): The gray fox prefers wooded areas and partially open brush land with little human presence. Based on habitat present along the routes, this species could potentially be found near or within the Project yet was not observed during field investigations. However, they are 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 potentially found near or within the Project Area yet 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 brushy areas. This species was not observed during the field investigations, yet potentially are found near or within the Project Area.

Muskrat (*Ondatra zibethicus*): The muskrat is a large freshwater rodent. This species was not observed during the field investigations, but it could inhabit select locations along the routes.

Raccoon (*Procyon lotor*): The raccoon is widespread in Ohio, even in many suburban and urban areas. Raccoons prefer wooded areas with water nearby. This nocturnal species was not observed during the field investigations, but it is likely present throughout the area.

Red fox (*Vulpes vulpes*): The red fox inhabits a wide range of habitats. This species was not observed during field surveys, yet potentially is present near or within 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.

Potentially desirable habitat is within the Project Area, and therefore, possible to be found in the Project Area.

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 logs in the woods, which may have been self-created or formerly used by other animals. This primarily nocturnal species was not observed during the field investigations, but it likely exists along the routes.

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 the field investigations, but it likely exists along the routes.

(c) Recreational Species

Recreational terrestrial species consist of those hunted as game. Recreational species expected to inhabit areas along the ROW include the following. This information was obtained from ODNR-DOW Species Guide Index (ODNR-DOW, 2012a).

(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 most of the routes.

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.

Geese: Several geese species can be found in Ohio, although typically during migration: snow geese (*Chen caerulescens*), greater white-fronted geese (*Anser albifrons*), cackling geese (*Branta hutchinsii*), and brant (*Branta bernicla*). The Canada goose (*Branta canadensis*) is commonly found throughout Ohio, both as residents and migrants. Habitat for Canada geese was observed along the routes and Canada geese were the only wild goose species observed during field surveys.

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 routes. 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 includes freshwater rivers and lakes, wooded lakes and ponds, and inland waters of coastal states, respectively. Habitat for these species is present along the routes in select areas. This species was not observed during field surveys.

Northern bobwhite quail (*Colinus virginianus*): The northern bobwhite quail is a forest edge species. This species could exist in select locations along the routes; however, it was 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 likely inhabits select locations along the routes; however, no pheasants were observed during field surveys.

Ruffed Grouse (*Bonasa umbellus*): Grouse habitat includes mixed hardwood shrub and forest stands. Large stands of mixed hardwood shrub and forests were present in select locations within the Project Area, and therefore, it is possible that the ruffed grouse occurs within the Project Area.

Teal: Several teal species could be found in Ohio. The cinnamon teal (*Anas cyanoptera*), green-winged teal (*Anas crecca*), and blue-winged teal (*Anas discors*) are waterfowl. They are usually birds of fresh, shallow marshes and rivers instead of large lakes and bays. Habitat for these species is not present along the routes in select areas, and no species were observed during field surveys.

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.

- 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. Habitat for this species does exist throughout the routes. 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 was not present 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. Habitat for this species was observed along the routes.

(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. This species' preferred habitat was found throughout the 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. Squirrels were observed during the field surveys along the routes.

White-tailed deer (*Odocoileus virginianus*): White-tailed deer are found in rural and suburban areas. Indirect evidence was identified along the routes.

Woodchuck (*Marmota monax*): Woodchucks live in open grasslands, pastures, and woodlands. This species was not observed during field surveys but is likely present throughout the routes.

(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 could potentially inhabit the larger streams, ponds, and lakes within the Project Area. A list of game fish known to occur in Ohio was obtained from ODNR-DOW's Sport Fish of Ohio Identification Guide (ODNR-DOW, 2012b). The list was 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 surveys.

Black crappie (*Pomoxis nigromaculatus*): Black crappie are widely distributed throughout Ohio and generally prefer clear water habitats with abundant aquatic vegetation. This species is likely to occur in streams, ponds, and lakes in the Project Area.

Bluegill (*Lepomis macrochirus*): Bluegill are found throughout the State, preferring clear ponds and lakes with rooted vegetation. This species is likely to occur in streams, ponds, and lakes in the Project Area.

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 could potentially be found within the Project Area.

Common Carp (*Cyprinus carpio*): Carp can be found in throughout the State, preferring turbid waters rich in organic matter. This species is likely to inhabit lakes and potentially ponds in the Project Area.

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 streams, ponds, and lakes in the Project Area.

Largemouth Bass (*Micropterus salmoides*): Largemouth bass are found in ponds, lakes, and slow sluggish streams throughout the State. This species is likely to inhabit lakes and potentially ponds in the Project Area.

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 is likely to occur in streams, ponds, and lakes in the Project Area.

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 occur in streams, ponds, and lakes in the Project Area.

White Crappie (*Pomoxis annularis*): White crappie inhabit large rivers, reservoirs, and lakes throughout Ohio and are tolerant to turbid waters. This species is likely to occur in streams, ponds, and lakes in the Project Area.

(2) Construction Impacts on Identified Species

Based on the nature of the proposed Project activities and habitat characteristics of the surrounding vicinity, construction impacts to protected species are not anticipated. Winter tree clearing (October 1 through March 31) to avoid impacts to bat species, and no in-water work in perennial streams from April 15 through June 30 to prevent impacts to indigenous aquatic species, will be adhered to. Additionally, ATSI has proposed to minimize impacts to wetlands and other water resources to the fullest extent possible through avoidance where possible and the utilization of BMPs to minimize erosion and sedimentation. ATSI will communicate with USFWS and ODNR regarding specific construction requirements, including specific recommendations for avoiding species specific habitat impacts if specified during coordination with USFWS or ODNR. The construction impact on other specific identified species (recreational and commercial) is expected to be minor due to avoidance of impacts during Project planning, the utilization of BMPs during Project construction, and the mobility of the listed recreational or commercial species.

(3) Operation and Maintenance Impacts on Identified Species

Minimal impacts are anticipated to protected wildlife during operation and maintenance of the transmission line. Clearing of secondary growth vegetation will be required along some portions of the ROW. Undeveloped land (woodlots) total approximately 23.1 percent of the Preferred Route and approximately 28.6 percent of the Alternate Route for the Brownhelm Section, and 6.6 percent of the Preferred Route and 18.4 percent of the Alternate Route for the Wellington Section. Operational activities and periodic maintenance of the ROW are not anticipated to impact wildlife significantly because of the minimal permanent ground disturbance and available adjacent habitat available.

(4) Mitigation Procedures

If areas are identified during the informal consultation process with USFWS and ODNR that are of special concern, ATSI will coordinate with these agencies to develop appropriate mitigation measures. The mitigation measure will be implemented if the area of special concern is located within the route approved by the OPSB.

(D) SITE GEOLOGY

(1) Site Geology

Brownhelm Section

The Brownhelm Section of the Project is located within Berea Headlands of the Erie Lake Plain Region of the Huron-Erie Lake Plains of the Central Lowland Province. This Region is underlain by the resistant Berea Sandstone, and is characterized by having several large sandstone headlands just into the Ice-Age lake basin and contains several streamlined whalebacks of the Berea Sandstone (ODNR-DGS, 1998). Both the Preferred Route and the Alternative Route are underlain by the Berea Sandstone and Bedford Shale, Undivided (ODNR-DGS, 1997).

Soils are primarily loams, and channery or sandy loams can be found along the alternative route, and gravelly loams and channery loams can be found along the preferred route (USDA NRCS, 2020a). The parent materials of soils in the Preferred and Alternative Routes are primarily outwash (Conotton, Jimtown, and Olmsted Groups), glaciolacustrine deposits over till (Haskins and Mermill Groups), alluvium (Holly Group), till over residuum weathered from sandstone (Mitiwanga Group), and residuum (Dekalb Group) (USDA NRCS, 2020b).

Wellington Section

The Wellington Section of the Project is located within the Galion Glaciated Low Plateau Region of the Till Plains Section of the Central Lowland Province. This region is characterized by rolling upland transitional zone between the gently rolling Till Plain, and the hilly Glaciated Allegheny Plateau with varying thickness of glacial drift, elevations ranging from 800 to 1,400 feet, and moderate relief.

Soils are primarily loams and silt loams, with minor amounts of silty clay loams (USDA NRCS, 2020a). The parent materials of these soils are primarily till (Ellsworth and Mahoning Groups), and also glaciolacustrine deposits (Fitchville Group and Mentor Group) and alluvium (Lobdell Group) along the Preferred Route (USDA NRCS, 2020b). The parent materials of these soils along the Alternative Route are also primarily till (Ellsworth and Mahoning Groups), as well as glaciolacustrine deposits (Fitchville, Sebring, and Lorain Groups), alluvium (Chagrin, Lobdell, Orrville, and Tioga Groups) and glaciolacustrine deposits over till (Haskins Group) (USDA NRCS, 2020b).

The Preferred Route is underlain by the Cuyahoga Formation (Mc), an Upper- and Lower-Mississippian aged unit composed of shale, siltstone, sandstone, conglomerate, and limestone (ODNR DGS, 1997). The Alternative Route is mostly underlain by the Cuyahoga Formation (approximately 86 percent of the Project Area), except for a small portion to the east of the transmission line which is underlain by the Berea Sandstone and Bedford Shale, Undivided (Mbbd) (approximately 14 percent of the Project Area), an Upper Devonian aged unit composed of sandstone, siltstone, and shale (ODNR DGS, 1997).

(2) Slopes and Foundation Soil Suitability

Slopes exceeding 12 percent, obtained from the NRCS, are identified in Figures 8-2A through 8-2C, Figures 8-3A through 8-3C, Figures 8-5A through 8-5N and Figures 8-6A through 8-6I. Within the Wellington Section, slopes exceeding 12 percent occur within 4.4 percent of the area within 1,000 feet of the Preferred Route and within 6.4 percent of the area within 1,000 feet of the Alternate Route. Slopes that exceed 12 percent along the Preferred Route include the following soil map units: Ellsworth silt loam, 12 to 18 percent slopes, eroded, Ellsworth silt loam, 18 to 50 percent slopes, eroded, and Mentor silt loam, 12 to 25 percent slopes (USDA NRCS, 2020c). Along the Alternative Route, slopes that exceed 12 percent include the following soil map units: Ellsworth silt loam, 12 to 18 percent slopes, eroded and Ellsworth silt loam, 18 to 50 percent slopes, eroded (USDA NRCS, 2020c). The Brownhelm Section does not have any slopes that exceed 12 percent along either route according to the soil map units (USDA NRCS, 2020c).

During construction, ASTI 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.

The bedrock geologies in the area consist mainly of shale, siltstone, and sandstone in the Wellington Section, and sandstone, siltstone, and shale in the Brownhelm Section (ODNR DGS, 1997). Overlaying soils are generally loams, with varying amounts of glacial till or deposits. To obtain further site-specific details on the suitability of the soils for foundation construction, ASTI 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.

ATSI 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.

(E) ENVIRONMENTAL AND AVIATION REGULATION COMPLIANCE

(1) Licenses, Permits, and Authorizations Required for the Facility

ASTI anticipates submitting a Notice of Intent for coverage under the OEPA General National Pollutant Discharge Elimination System (NPDES) Permit. Coverage under USACE's Nationwide Permit 12 for wetland and waterbody impacts associated with Utility Line Activities may be required but will be determined once the construction plan is finalized and therefore impacts to waters can be determined. It is also anticipated that multiple road crossing permits will be required.

(2) Construction Debris

The site will be kept clean of debris resulting from the work. Debris associated with construction of the proposed transmission line will likely include 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 OEPA-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) Stormwater and Erosion Control

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, 2018); and the OEPA NPDES Permit Program for the discharge of stormwater from construction sites.

Wetlands, streams, and other environmentally sensitive areas will be clearly marked before the start of 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 H-frame structures/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.

Access paths to proposed pole locations will be evaluated when more detailed engineering is completed and as landowner negotiations progress. If a new stream crossing is necessary, the Applicant will use temporary culverts or temporary access bridge methods. 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 and authorized within environmental permits.

Although grubbing activities are not anticipated, sediment basins, traps, and perimeter sediment controls will be implemented within 7 days of any potential grubbing activities. Sediment controls will continue to function until disturbed areas are permanently stabilized.

Silt Fence: Silt fencing 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, 2018) 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 constructed before upslope land disturbance begins.
- All silt fences 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 fences will be brought upslope slightly so that water ponded by the silt fence will be prevented from flowing around the ends.
- Silt fences will be placed on the flattest area available.
- Where possible, vegetation will be preserved for 5 feet (or as much as possible) upslope from the silt fence. If vegetation is removed, it will be reestablished within 7 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 6 inches deep. The trench will be made with a 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 8 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.
- 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.

<u>Soil Stabilization:</u> Disturbed areas that remain unworked for more than 21 days will be stabilized with seed and mulch no later than 14 days after the last construction in that area.

<u>Maintenance and Inspection:</u> Erosion and sediment control practices will be inspected at least once every 7 days and within 24 hours after any storm event greater than 0.5 inch of rain per 24-hour period.

ATSI 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 must 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 measures taken.

A stormwater detention basin will be required at the Wellington Substation expansion. This stormwater basin is currently being designed and will be included in the SWPPP.

(4) Disposition of Contaminated Soil and Hazardous Materials

All materials stored onsite 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 (MSDS) or Safety Data Sheets (SDS) will be retained and available onsite at all times.

The following General Conditions will also be included in the SWPPP to address disposition of contaminated soil and hazardous materials generated or encountered during construction:

Spill Prevention

The following spill prevention methods and procedures are proposed:

- All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled.
- Secondary containment will be provided for all onsite fuel storage tanks required during construction.
- 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 onsite.
- Spills will be reported to the appropriate government agency as required.
- Suspected hazardous materials encountered during construction will be reported to the regional environmental coordinator by the transmission construction representative. In addition, the Project Manager will be notified.

(5) Maximum Height of Above Ground Structures

The height of the tallest anticipated aboveground structure and construction equipment is designed to be approximately 120 feet. The nearest airport, Lorain County Regional Airport, located in Elyria Ohio, is approximately 5 miles southeast of the Brownhelm Section and 13.3 miles north of Wellington Station.

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 the Ohio Department of Transportation, 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 forth in OAC 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 more than 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, ATSI will review the need for any permitting with the FAA and will follow recommendations made by the FAA.

(6) Dusty or Muddy Conditions Plan

Dust Control

The site and surrounding areas will be kept free from dust nuisance resulting from site activities. During excessively dry periods of active construction, dust suppression will be implemented where necessary through irrigation, mulching, or application of tackifier resins.

Excessive Muddy Soil Conditions

Construction entrances will be established and maintained to a condition that will prevent tracking or flowing of sediment onto public ROW. Accumulated sediment spilled, dropped, washed, or tracked onto public ROWs will be removed as soon as practical.

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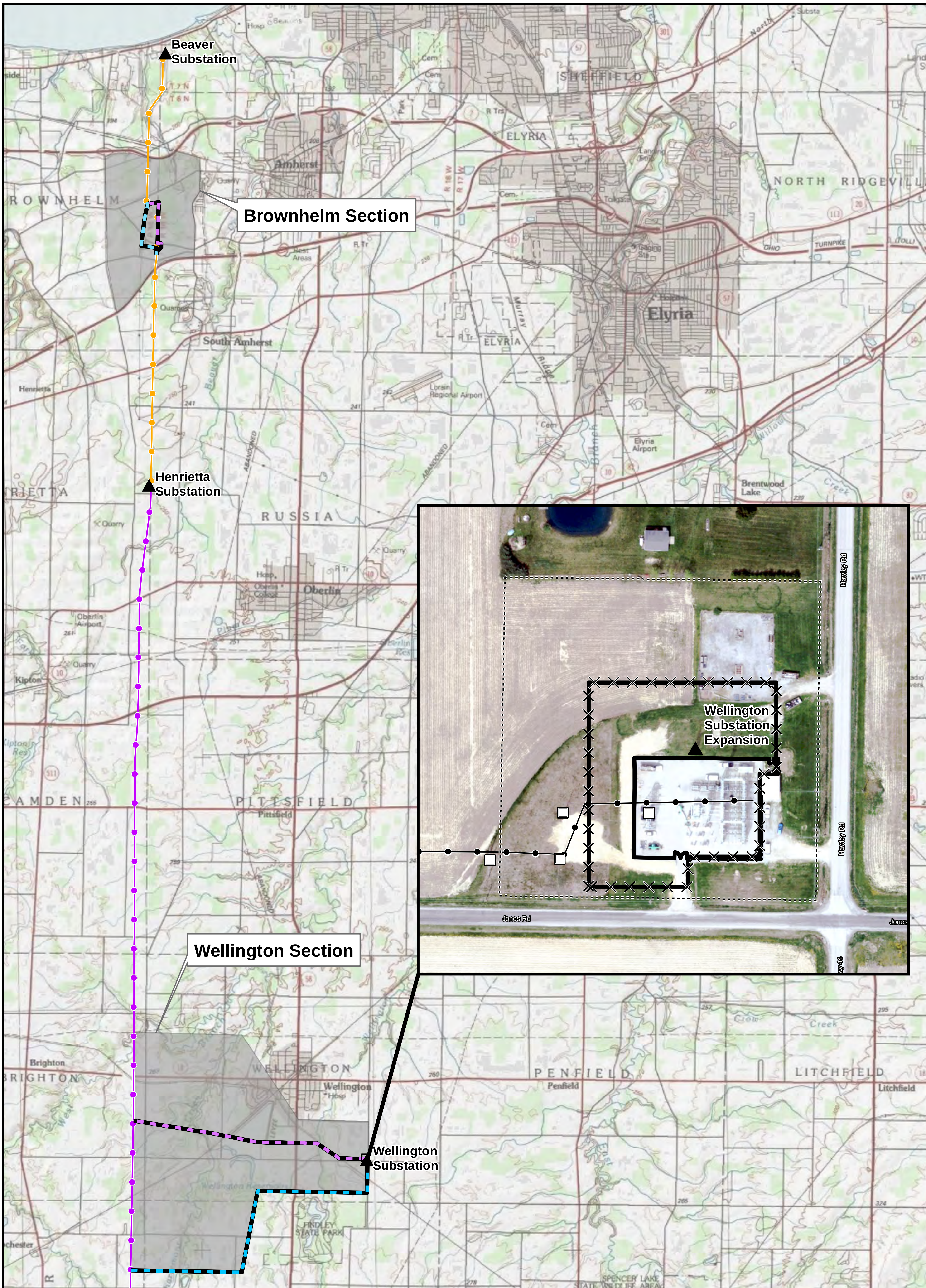
Figures



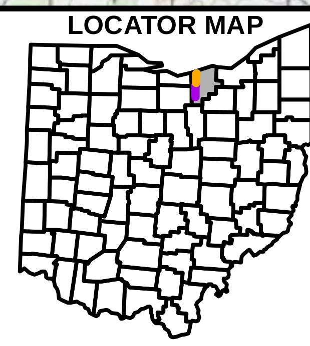
LEGEND:

- Substation
- Preferred Route
- Alternate Route
- Beaver-Henrietta 138kV Transmission Line
- Brookside-Henrietta 138kV Transmission Line
- Study Area

Wellington Substation Expansion

- Proposed Expansion
- Existing Fenceline
- Possible Limits of Disturbance
- Existing 138 kV Transmission Line

LOCATOR MAP



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BASE MAP SOURCE: Esri USA Topo Map

0 1.5 3
MILES

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

Beaver-Wellington 138 kV Transmission Line Project

Figure 2-1
Overview Map

8/19/2020

Jacobs

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\SITING\HENRIETTA_FIGURE_1_OVERVIEW.MXD DG066919 8/19/2020

LEGEND:

Preferred Route

Alternate Route

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

LOCATOR MAP

Lorain County

BASE MAP SOURCE: Esri World Imagery

Coordinate System: State Plane Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale 1:6,000

8/17/2020

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

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

FIGURE 2-2
PROJECT OVERVIEW AND AREA FEATURES

0 400 800
FEET

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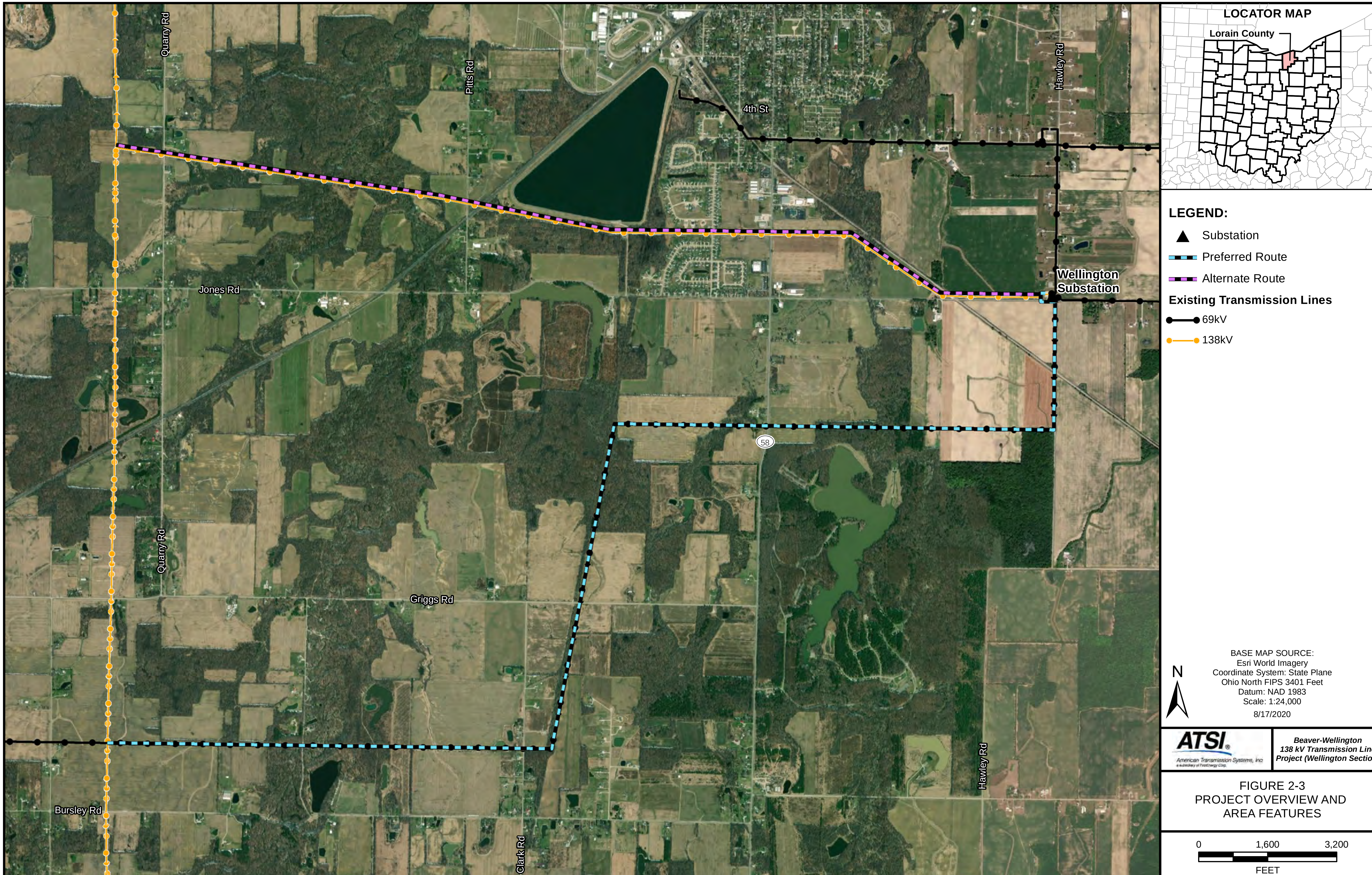

BASE MAP SOURCE:
Esri World Imagery
Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:24,000

8/17/2020

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 2-3
PROJECT OVERVIEW AND AREA FEATURES

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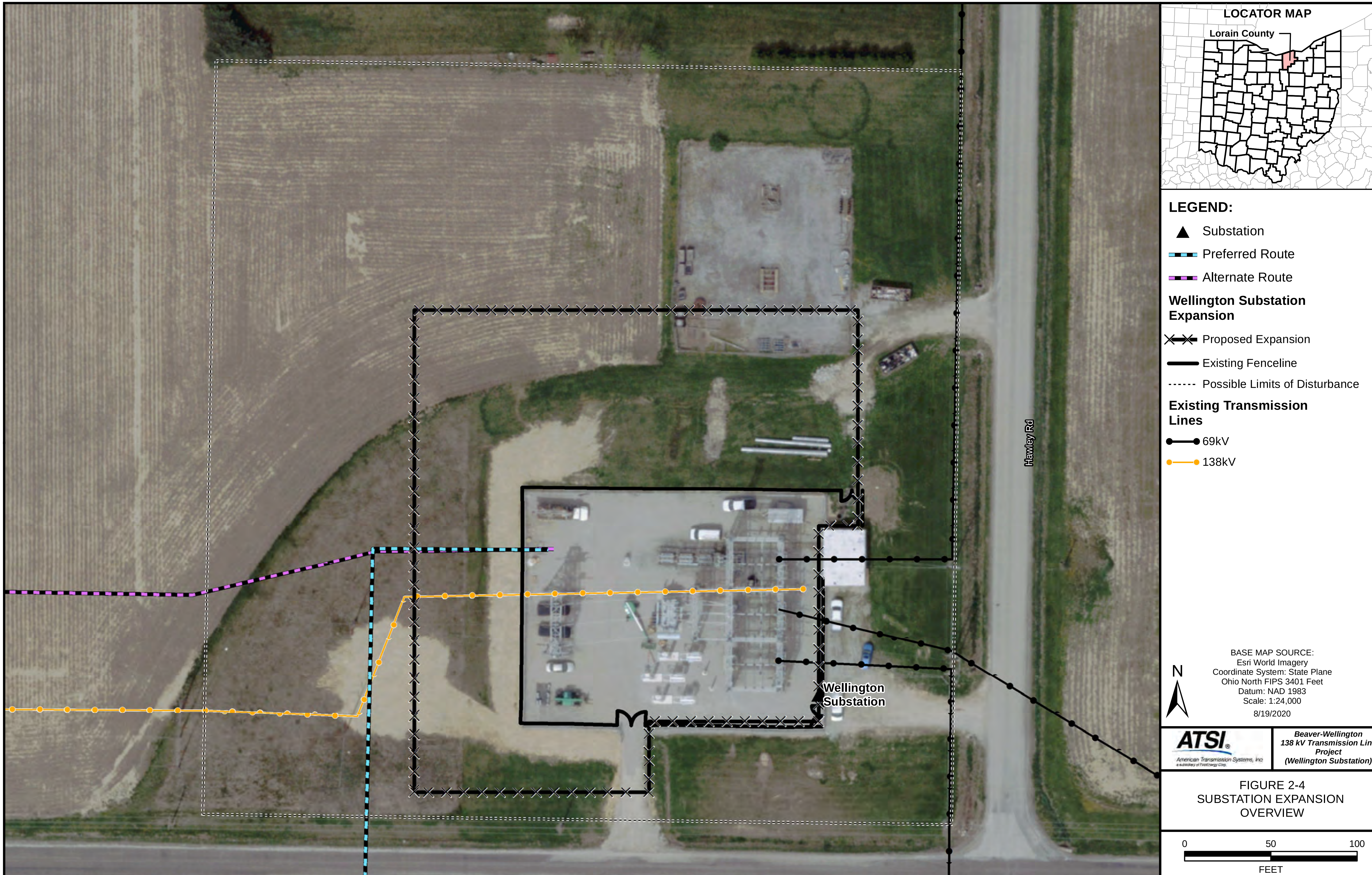
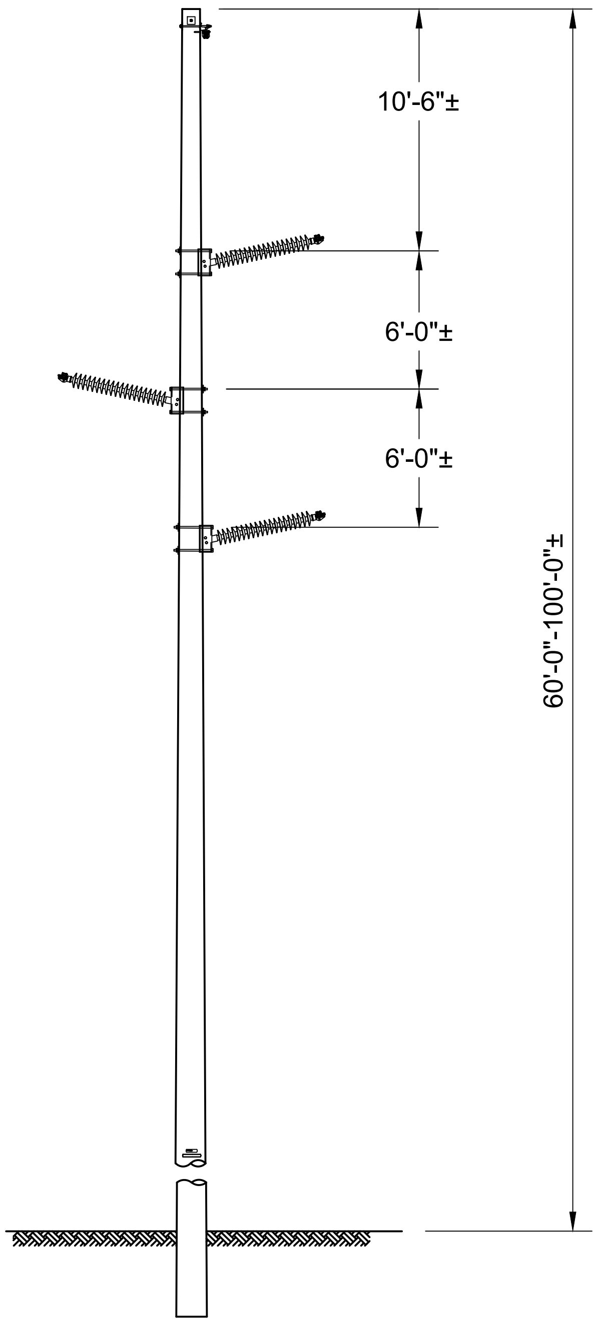


FIGURE 2-4
SUBSTATION EXPANSION OVERVIEW

Figure 5-1 (Exhibits 1 through 20)



SCALE: NTS

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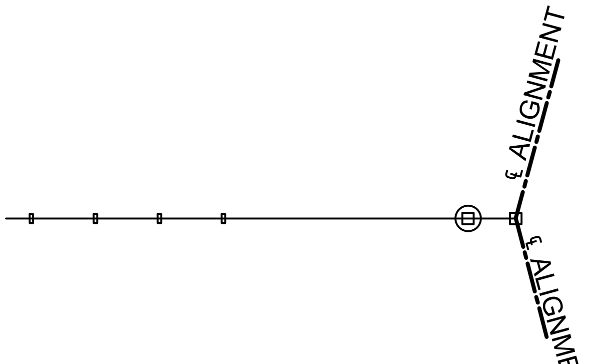
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

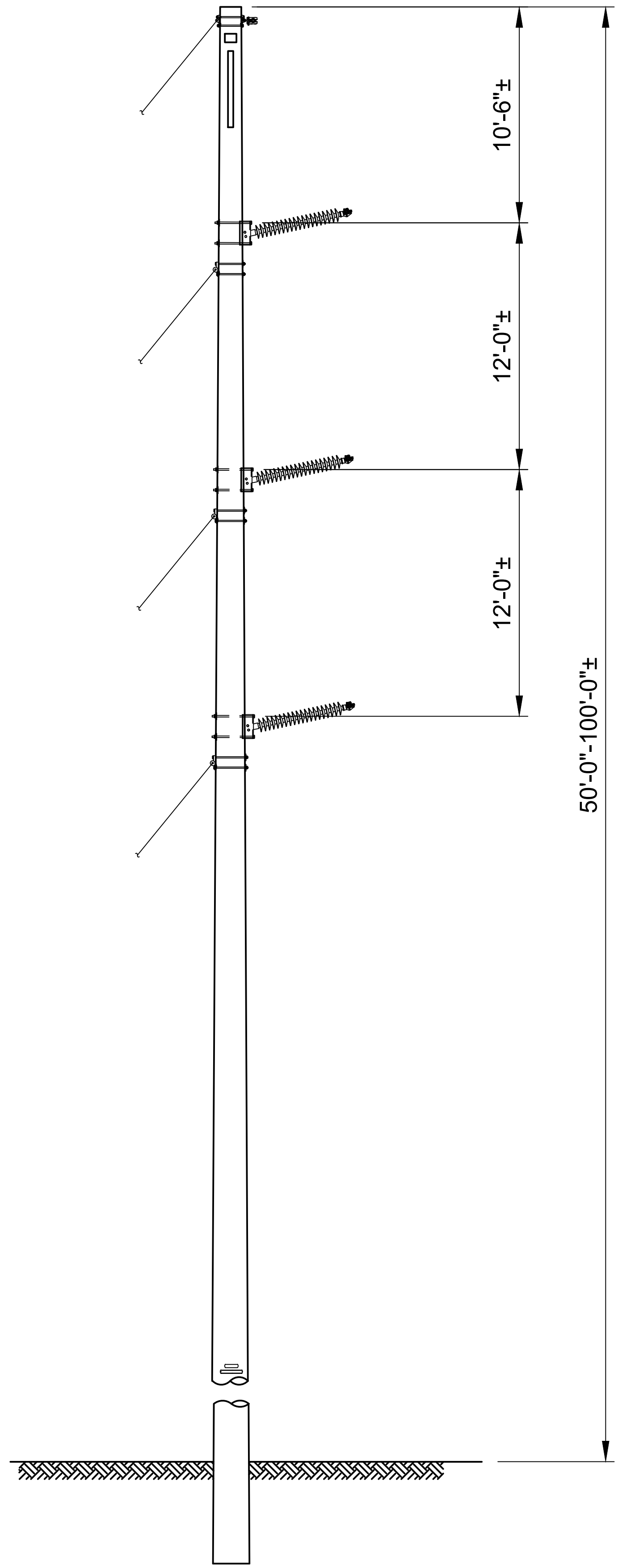
SINGLE CIRCUIT POST DELTA
TANGENT WOOD STRUCTURE

EXHIBIT 1

PAPER SIZE: 8.5X11



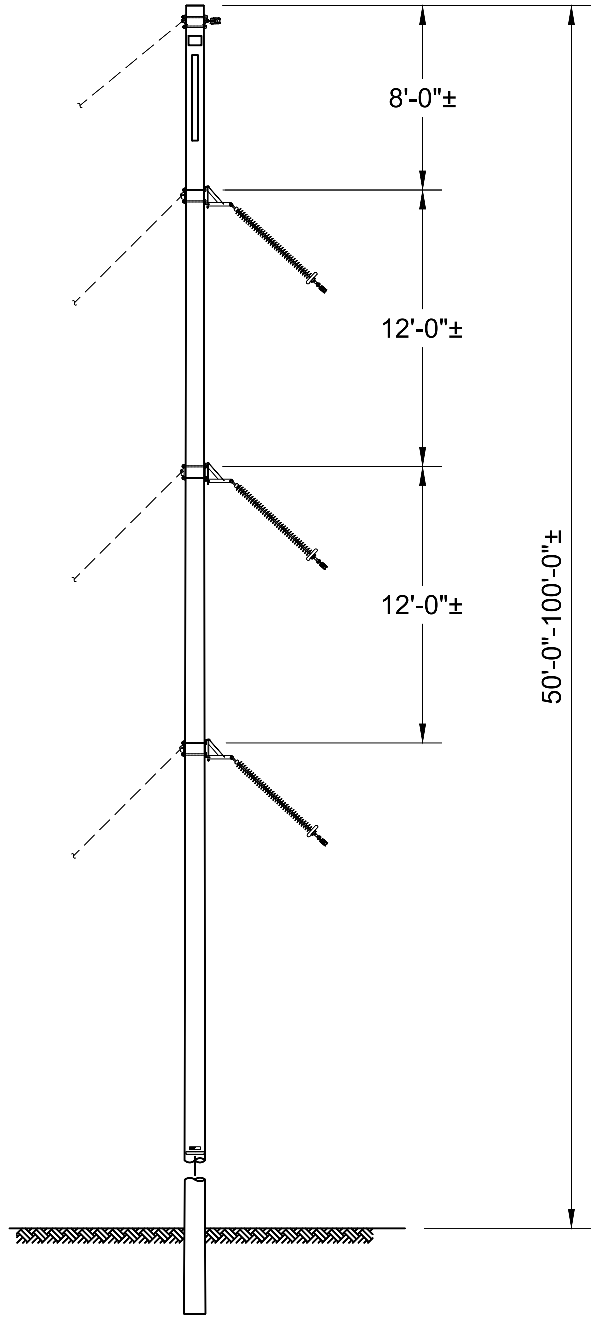
TYPICAL GUYING DETAIL

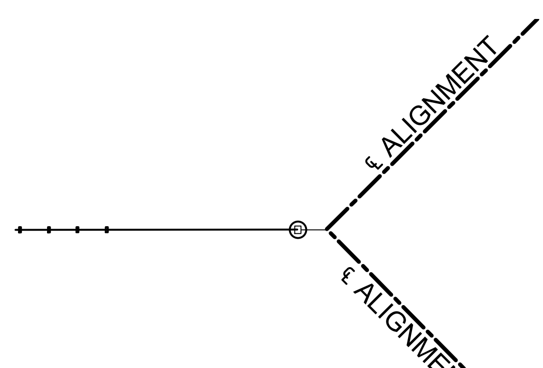


SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT POST VERTICAL LIGHT ANGLE WOOD STRUCTURE	
EXHIBIT 2	

PAPER SIZE: 8.5X11



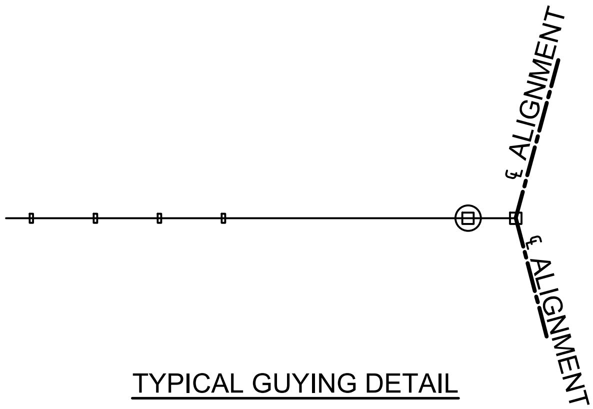


TYPICAL GUYING DETAIL

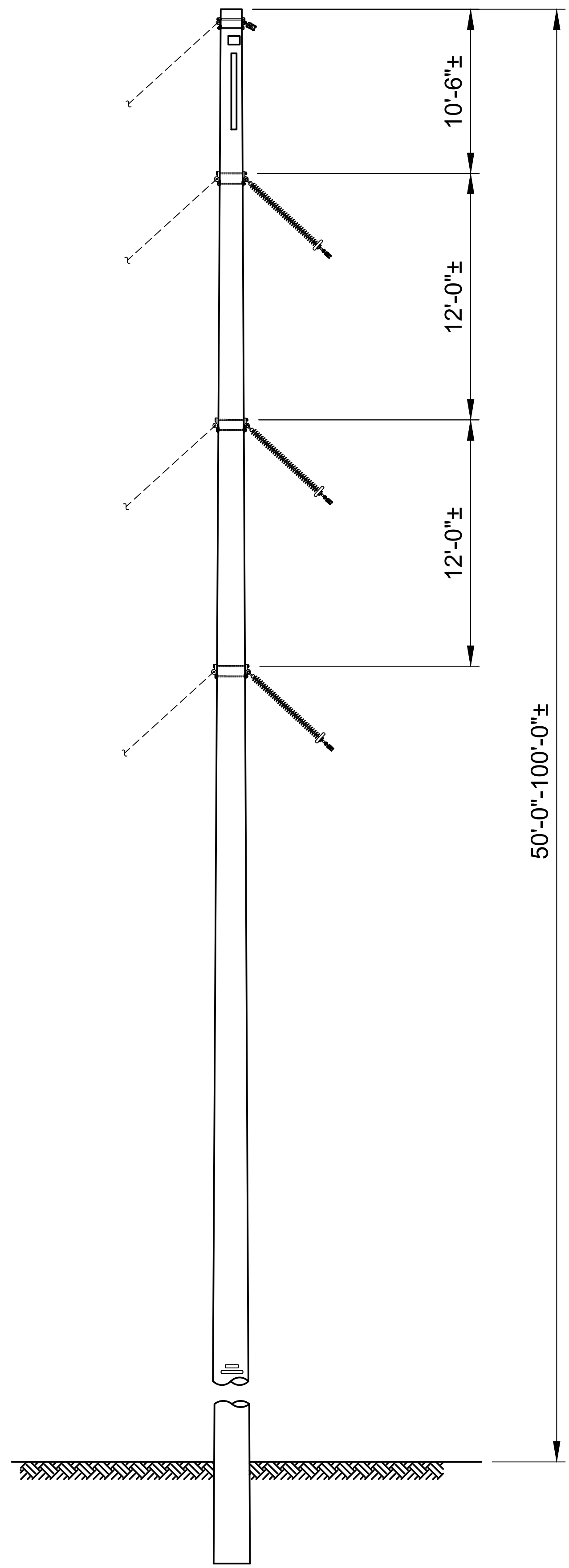
SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT SUSPENSION VERTICAL MEDIUM ANGLE WOOD STRUCTURE	
EXHIBIT 3	

PAPER SIZE: 8.5X11



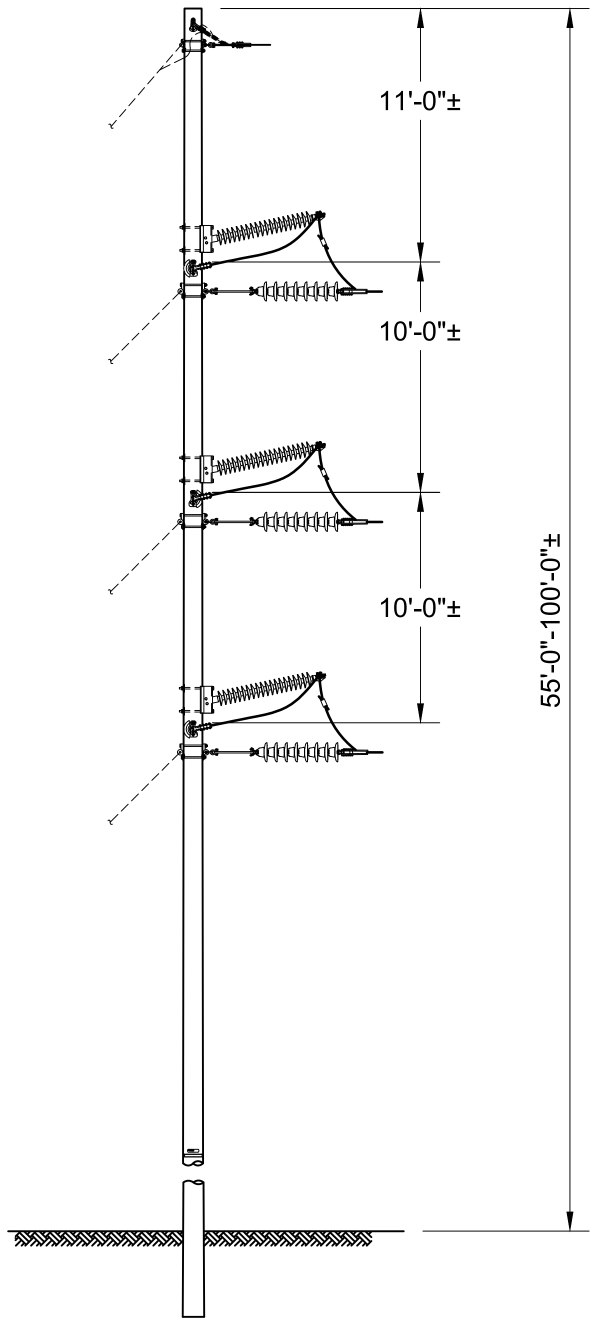
TYPICAL GUYING DETAIL

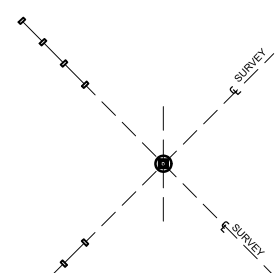


SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT SUSPENSION VERTICAL HEAVY ANGLE WOOD STRUCTURE	
EXHIBIT 4	

PAPER SIZE: 8.5X11



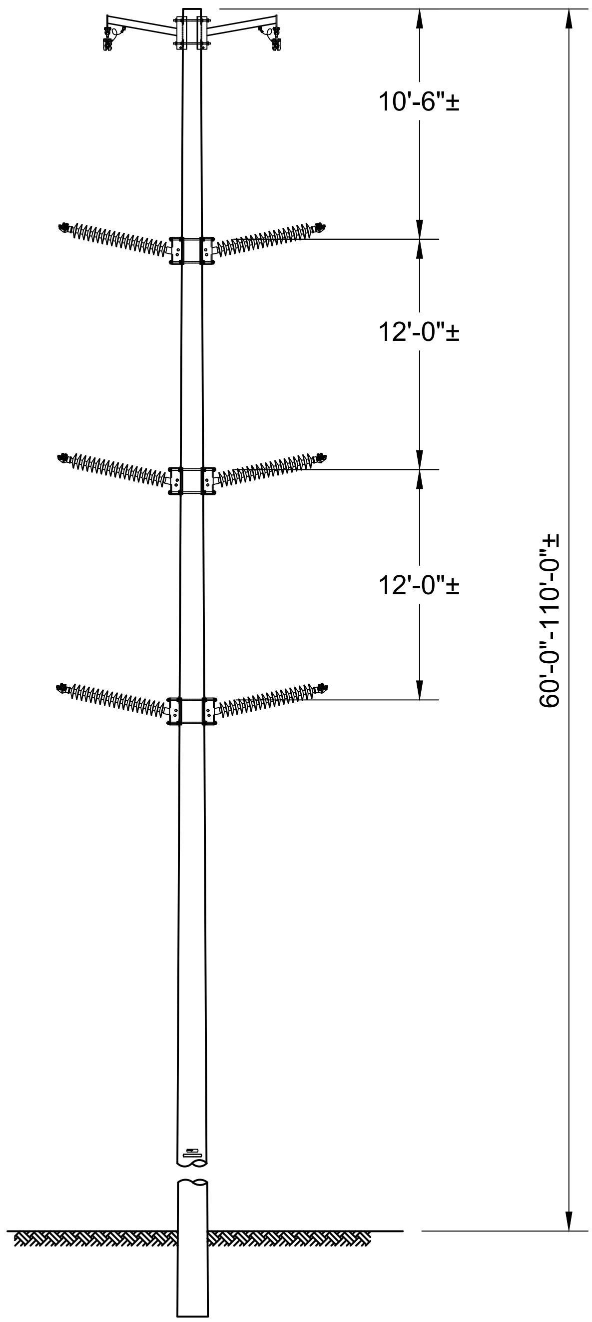


TYPICAL GUYING DETAIL

SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT DEAD END VERTICAL WOOD STRUCTURE	
EXHIBIT 5	

PAPER SIZE: 8.5X11



SCALE: NTS

ATSI®
American Transmission Systems, Inc.
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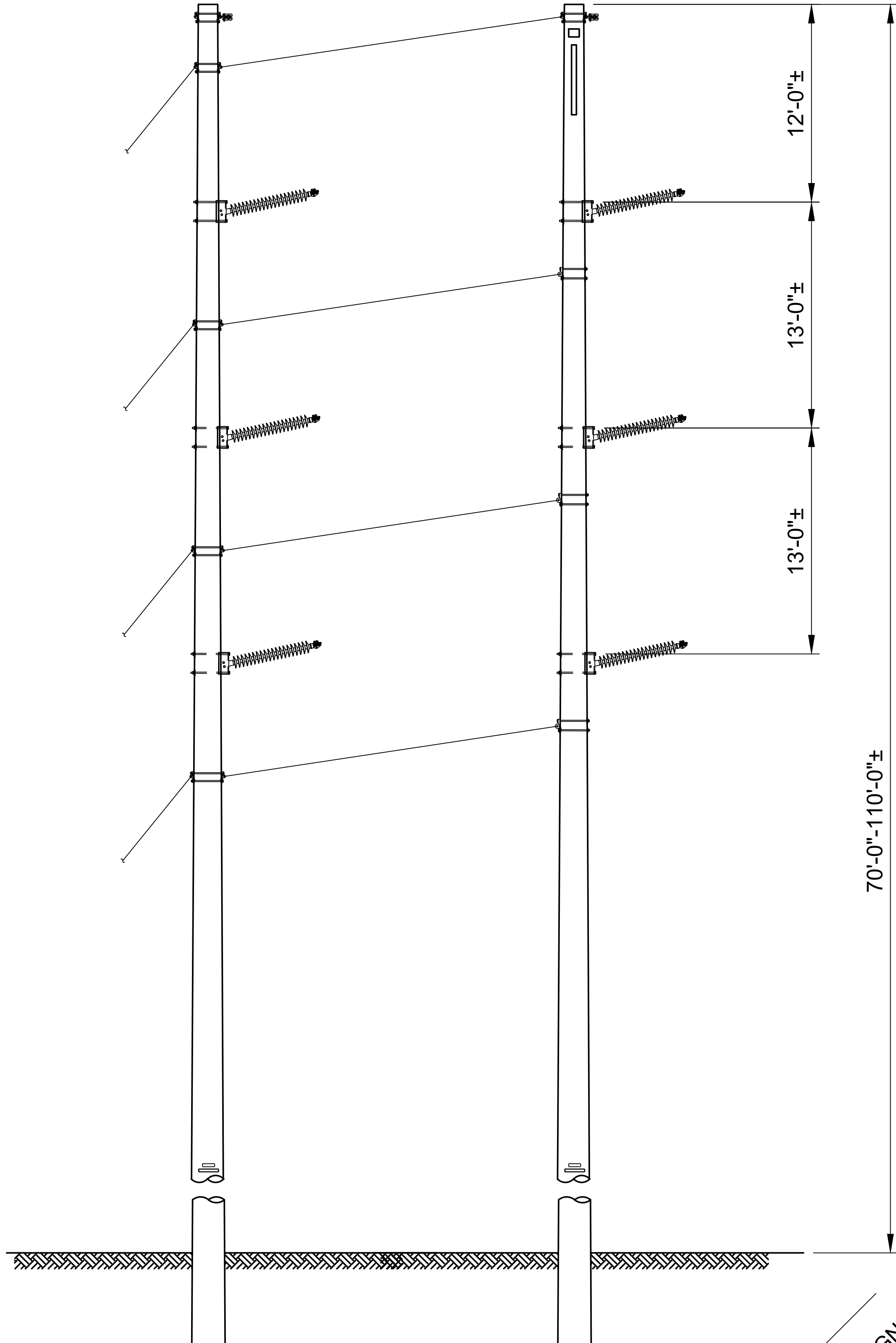
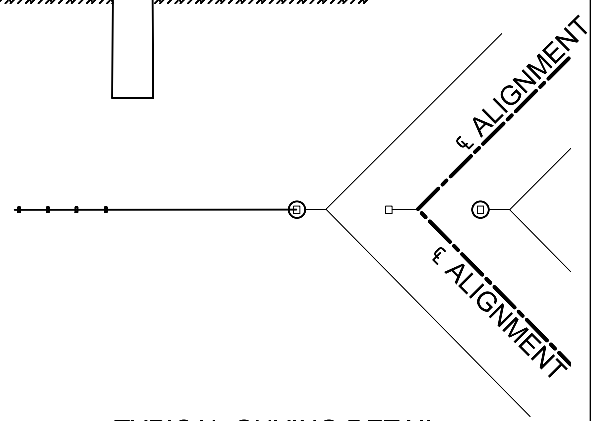
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT POST VERTICAL
TANGENT WOOD STRUCTURE

EXHIBIT 6

PAPER SIZE: 8.5X11





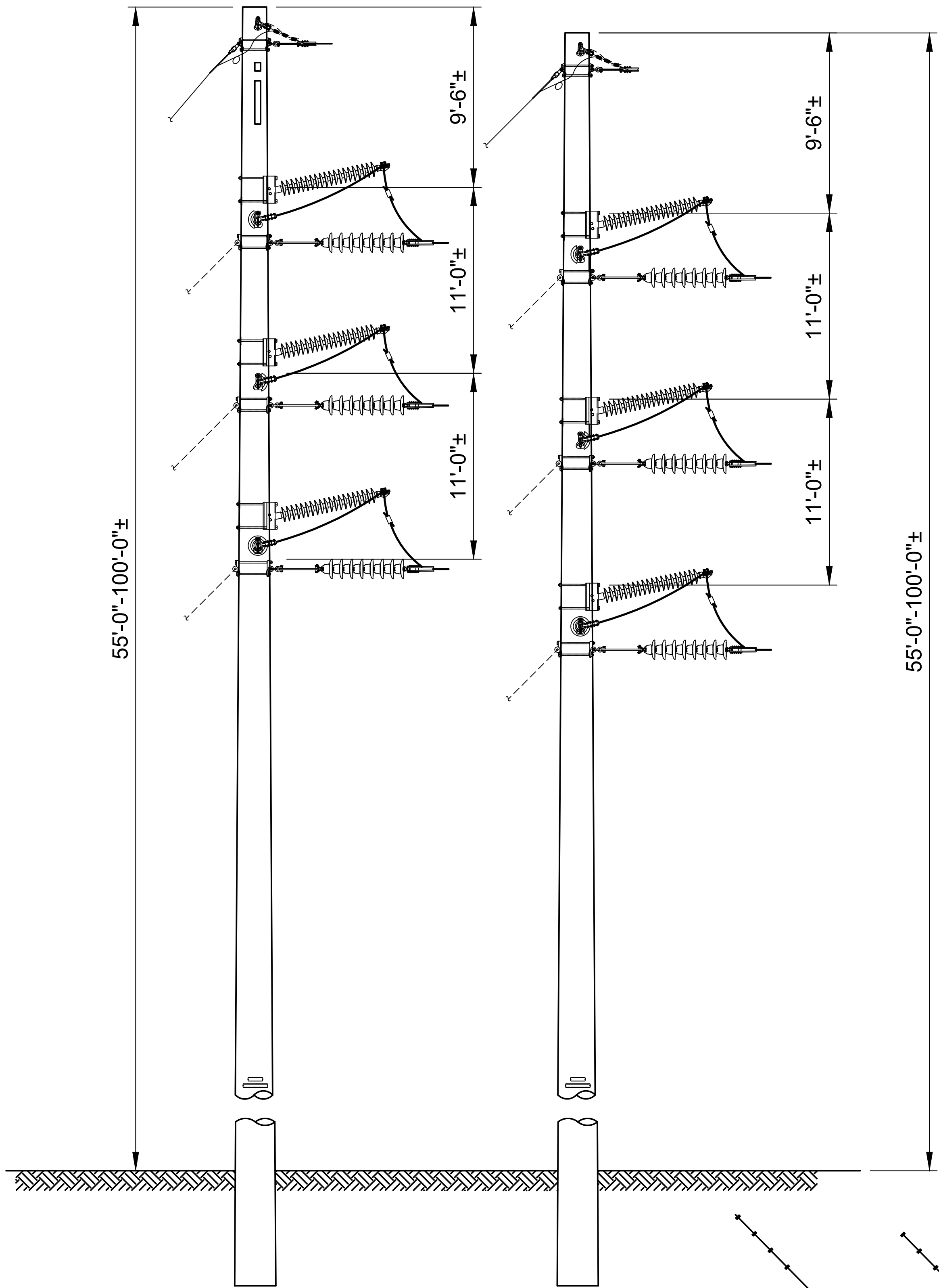
SCALE: NTS

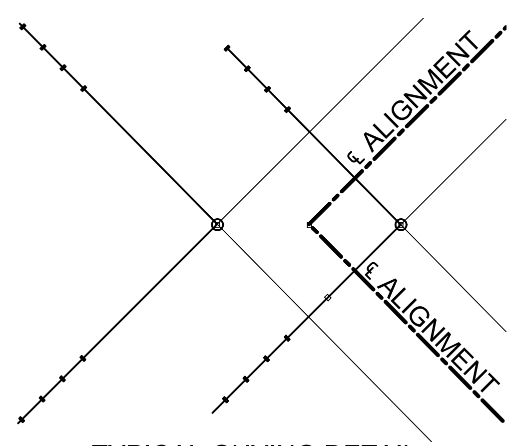
ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT POST VERTICAL ANGLE
TWO POLE WOOD STRUCTURE

EXHIBIT 7

PAPER SIZE: 8.5X11





TYPICAL GUYING DETAIL

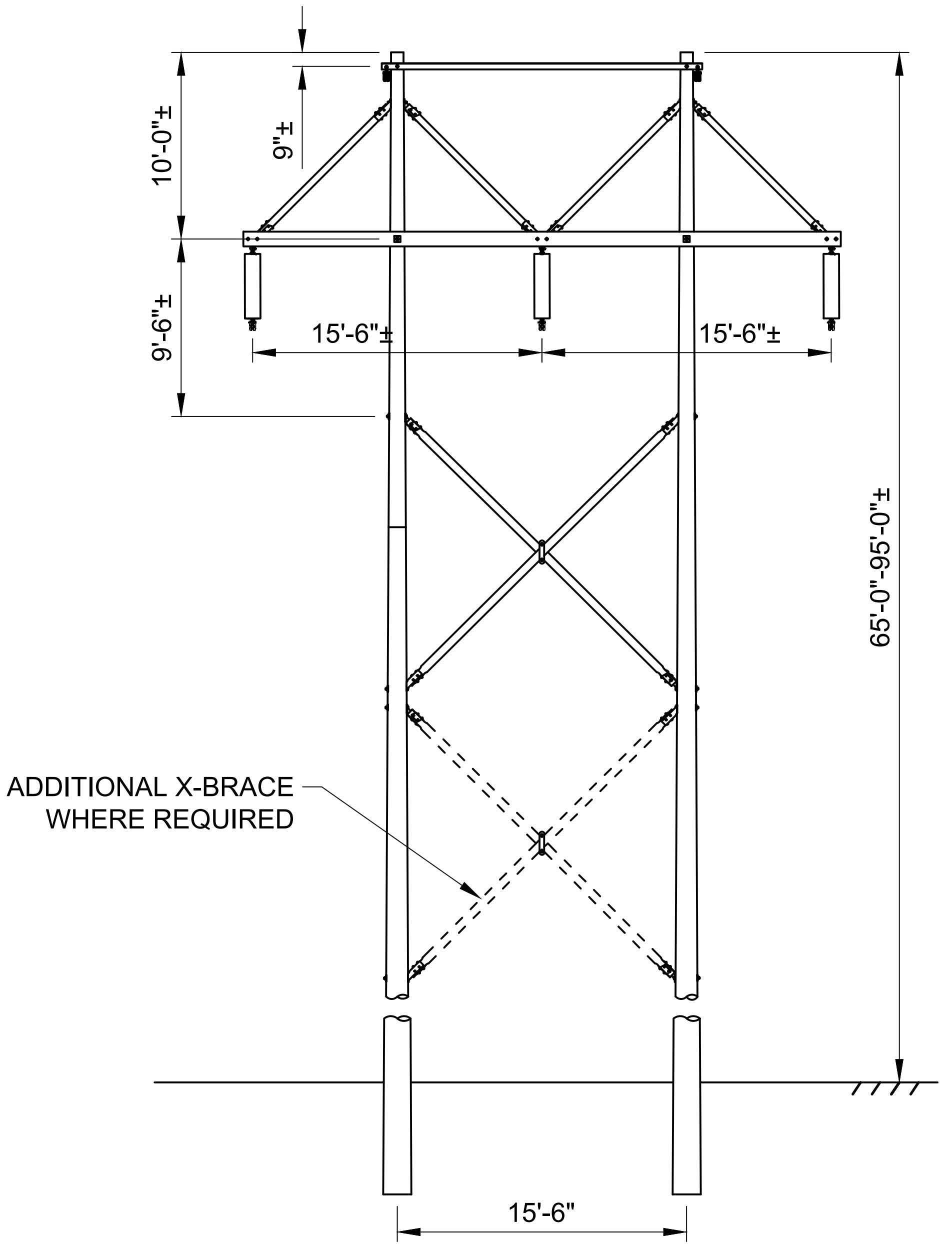
SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT DEAD END VERTICAL
TWO POLE WOOD STRUCTURE

EXHIBIT 8

PAPER SIZE: 8.5X11



SCALE: NTS

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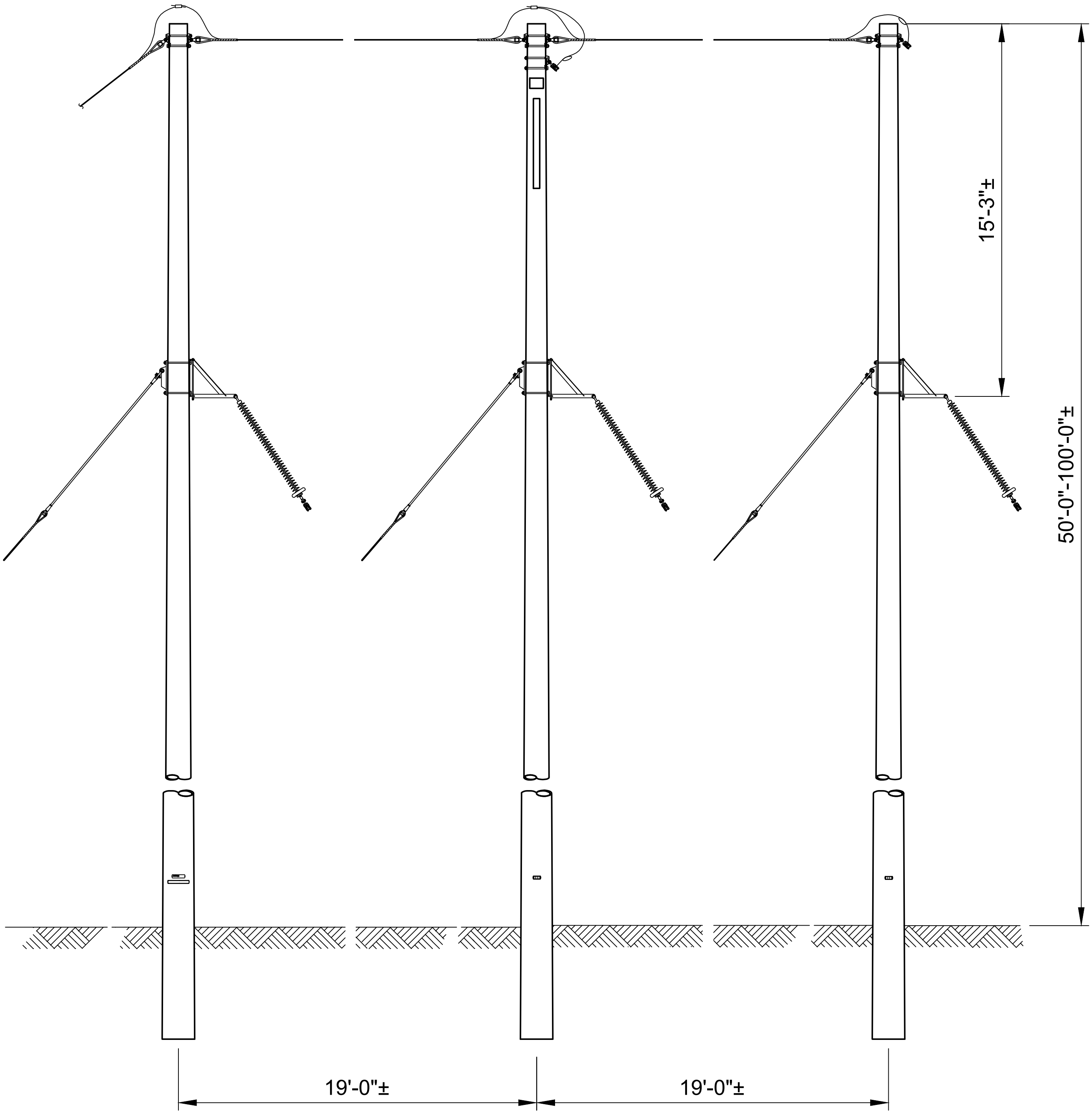
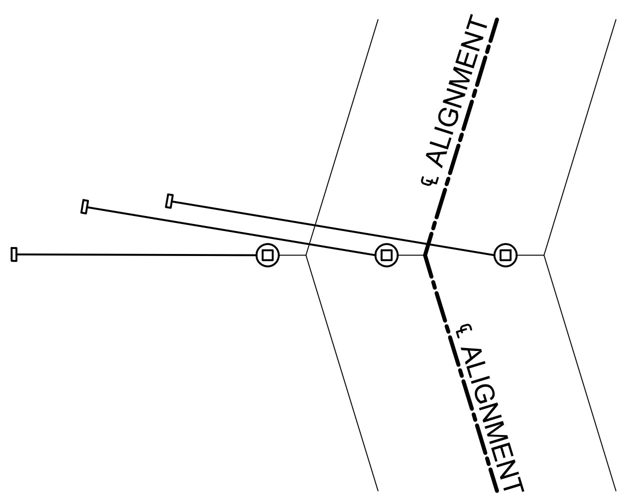
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

SINGLE CIRCUIT SUSPENSION H–FRAME
TWO POLE WOOD STRUCTURE

EXHIBIT 9

PAPER SIZE: 8.5X11



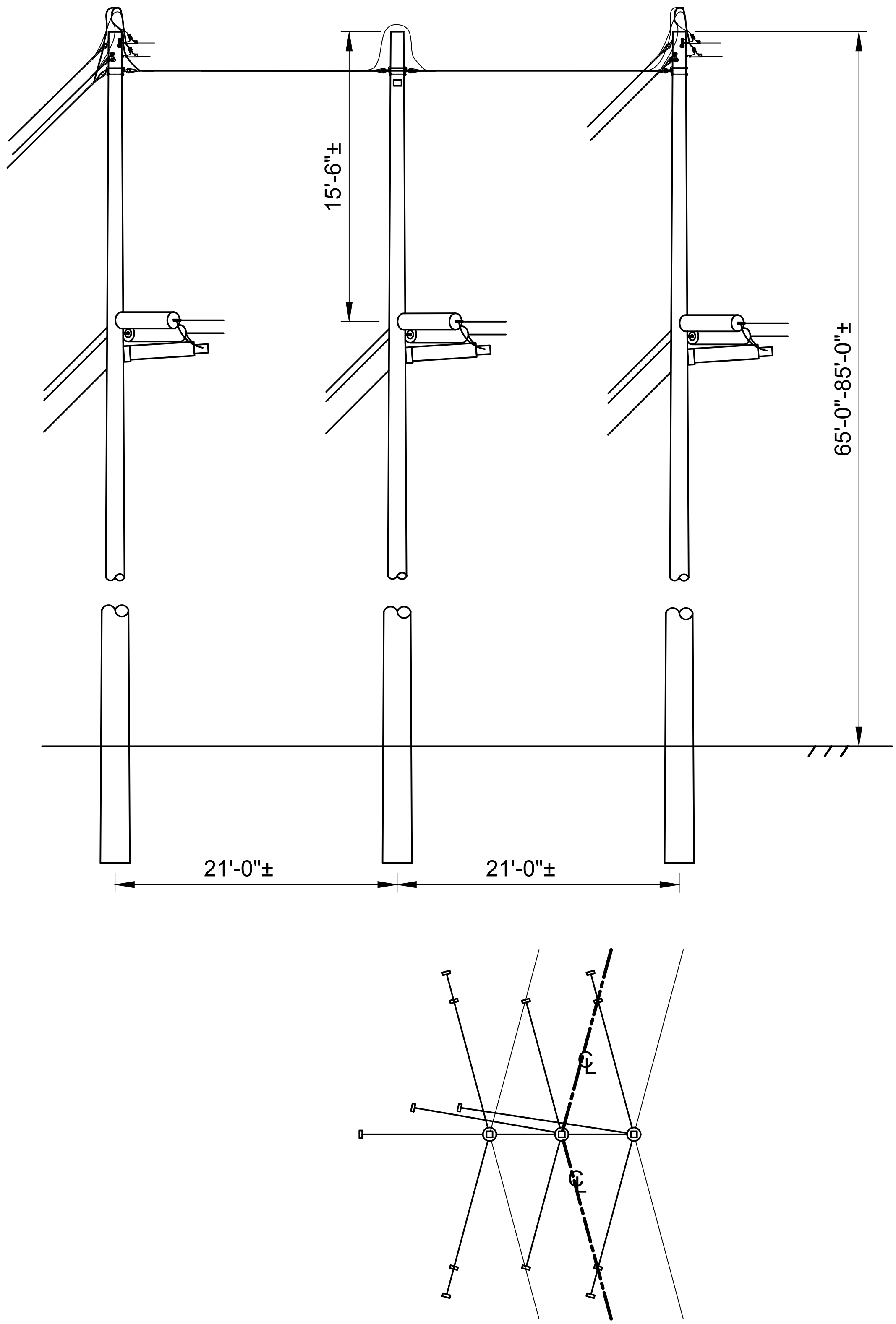


TYPICAL GUYING DETAIL

SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT SUSPENSION ANGLE THREE POLE WOOD STRUCTURE	
EXHIBIT 10	

PAPER SIZE: 8.5X11



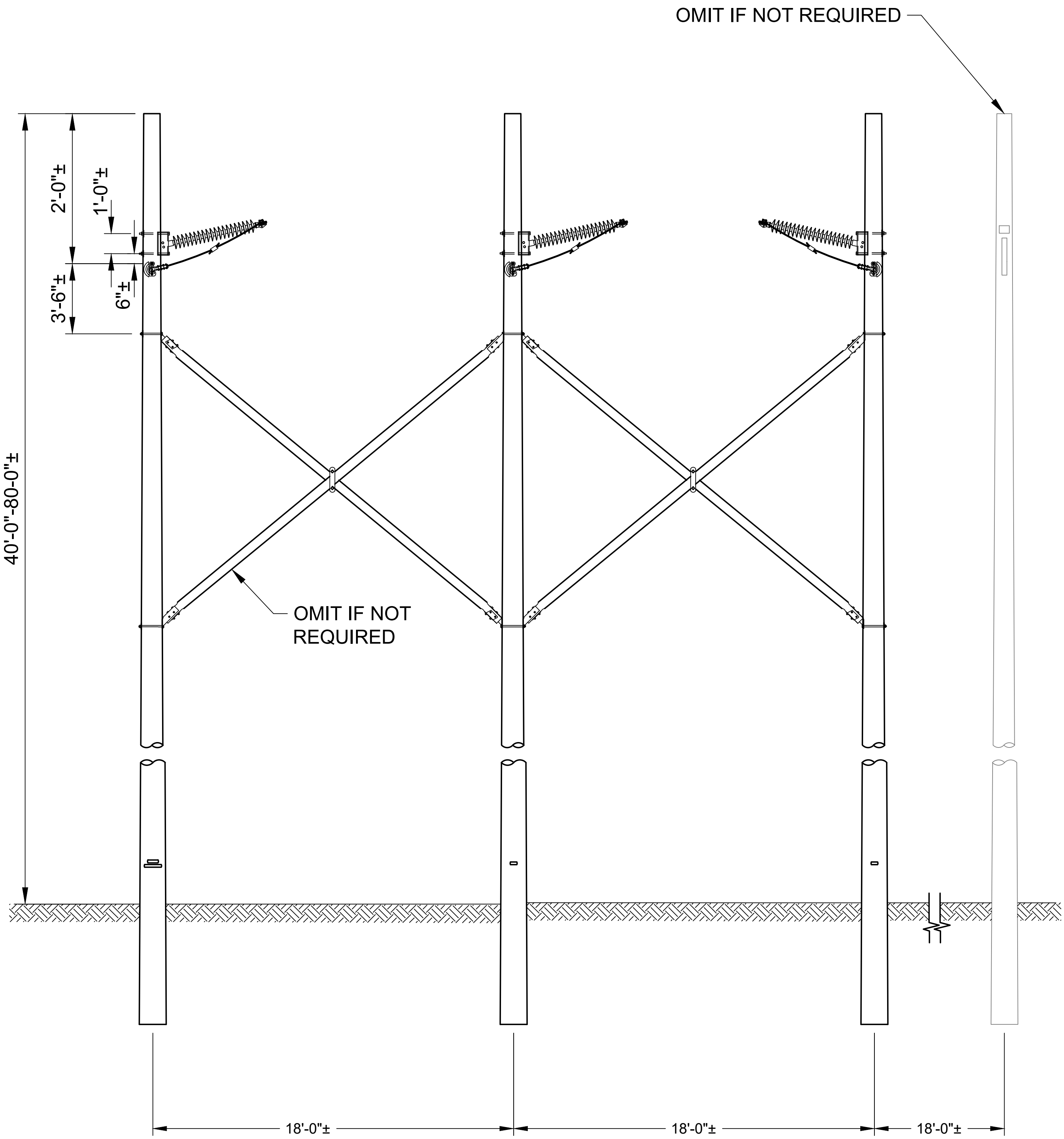
SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT

SINGLE CIRCUIT DEAD END ANGLE
THREE POLE WOOD STRUCTURE

EXHIBIT 11

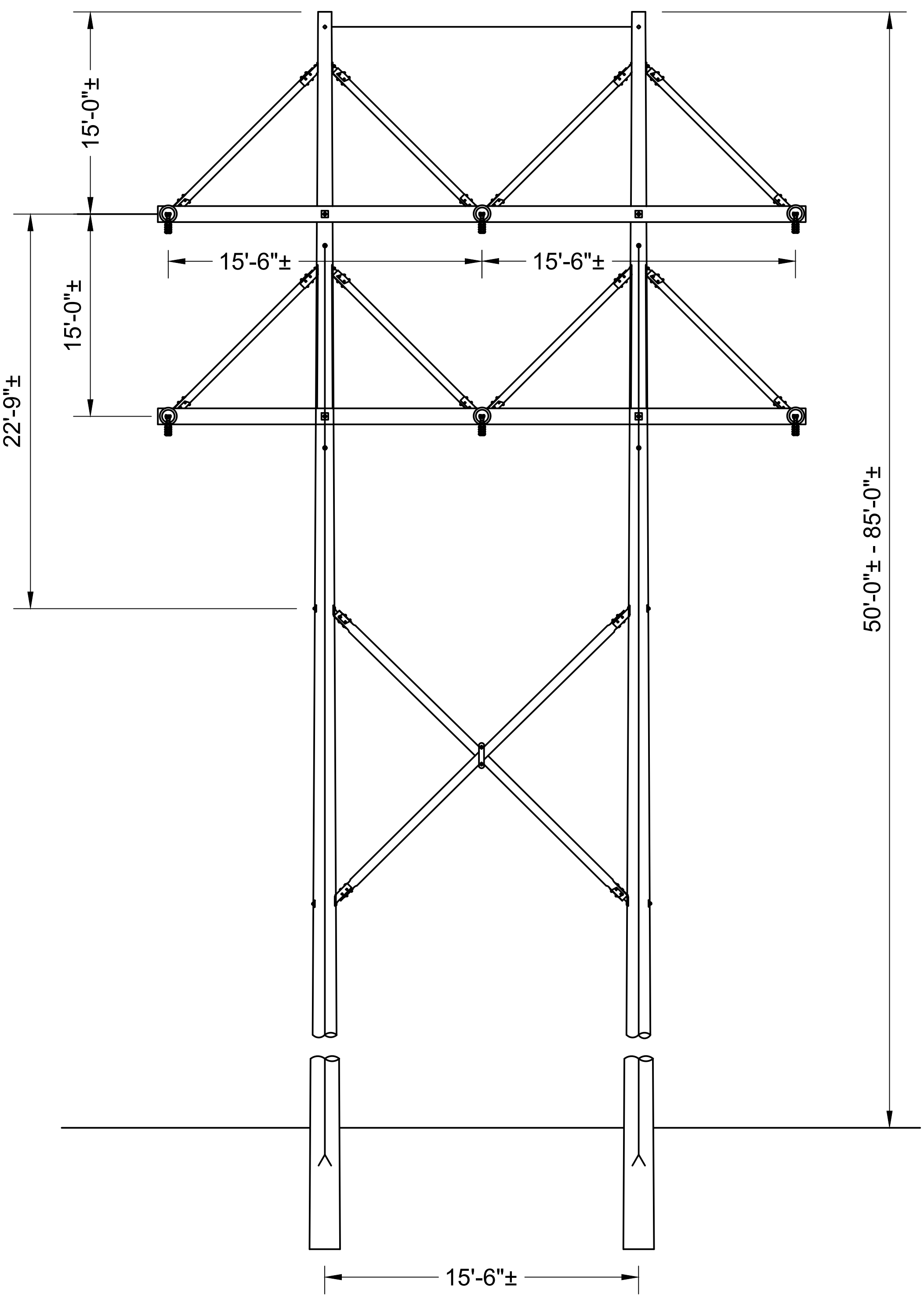
PAPER SIZE: 8.5X11



SCALE: NTS

ATSI® American Transmission Systems, Inc. a subsidiary of FirstEnergy Corp.	BEAVER–WELLINGTON 138KV TRANSMISSION LINE PROJECT
SINGLE CIRCUIT STRAIN CROSSING WOOD STRUCTURE	
EXHIBIT 12	

PAPER SIZE: 8.5X11



SCALE: NTS

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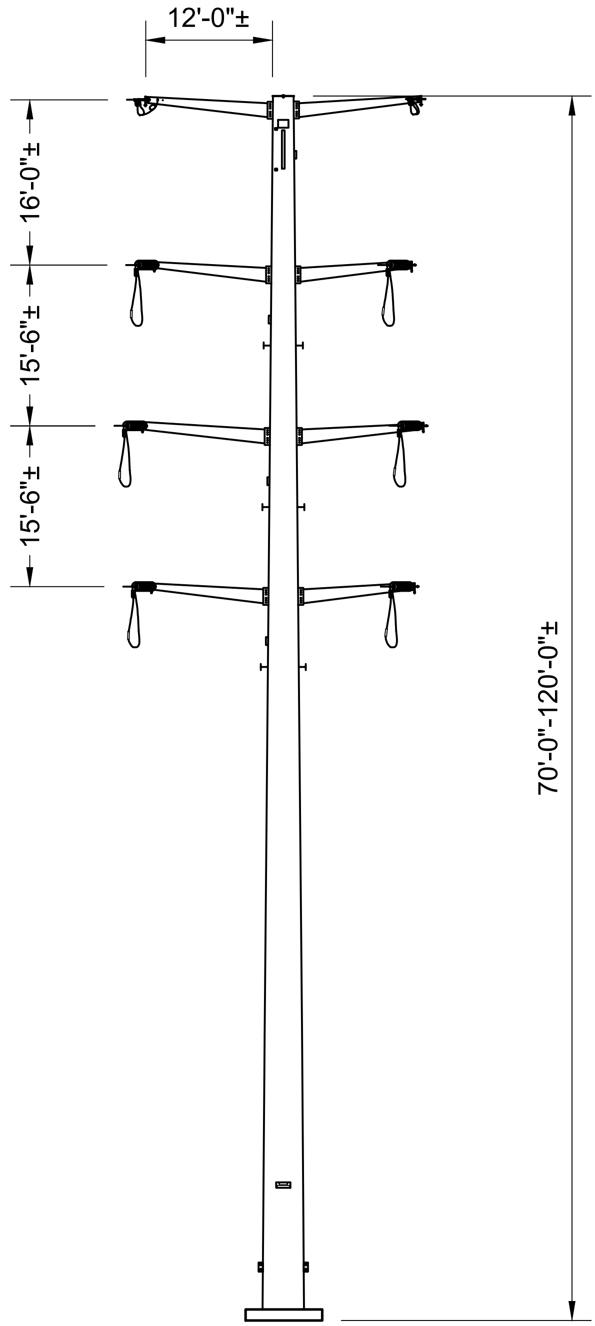
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT STRAIN H–FRAME
CROSSING WOOD STRUCTURE

EXHIBIT 13

PAPER SIZE: 8.5X11



SCALE: NTS

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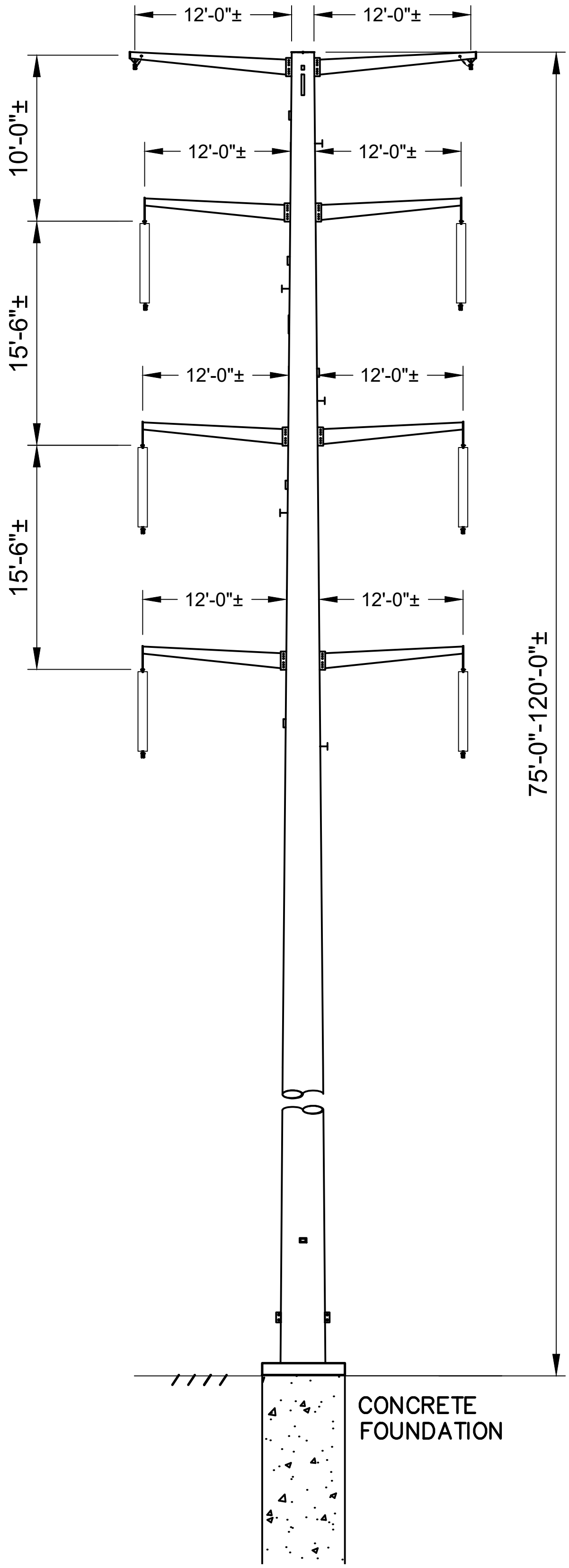
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT DEAD END VERTICAL
STEEL STRUCTURE

EXHIBIT 14

PAPER SIZE: 8.5X11



SCALE: NTS

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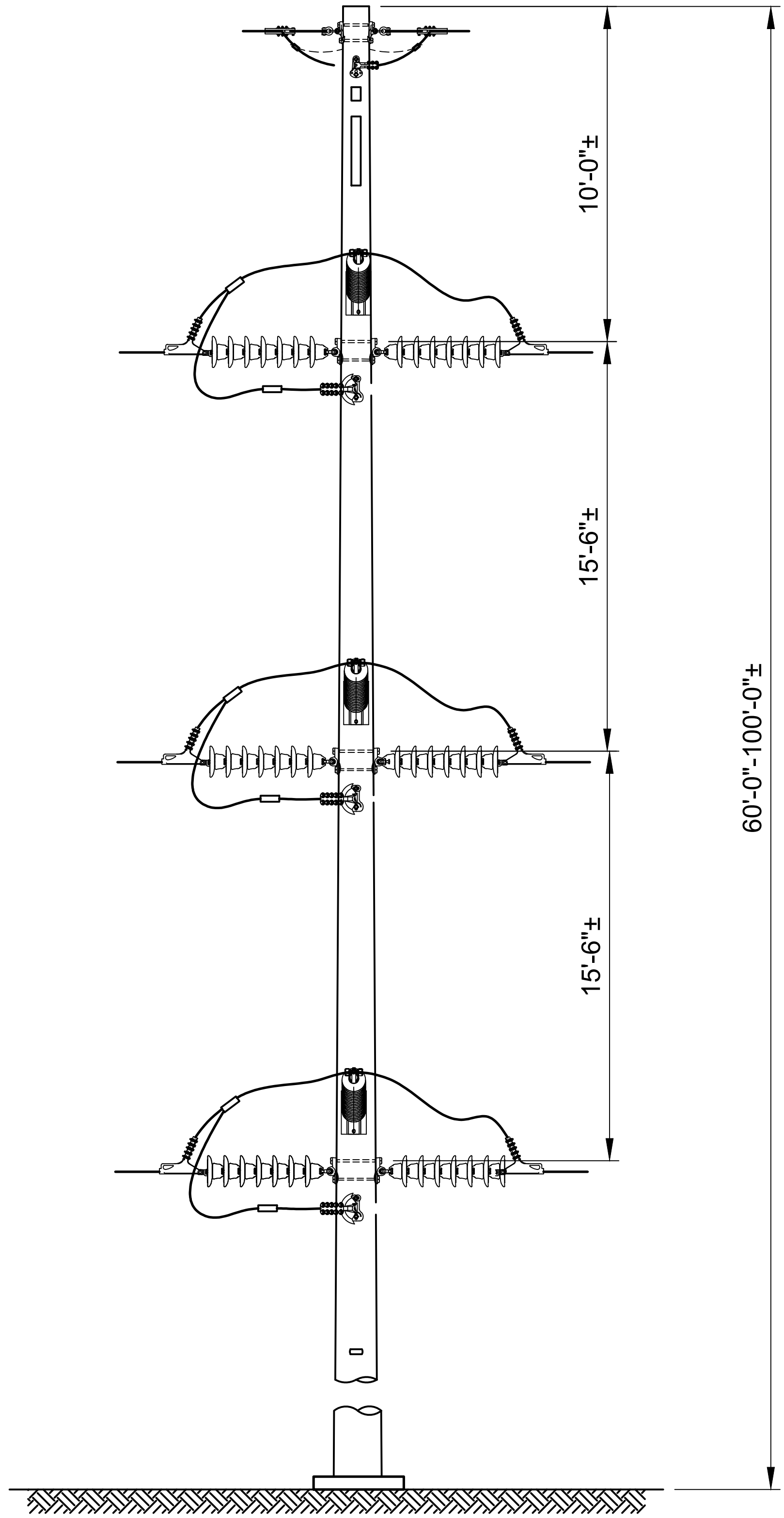
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT SUSPENSION VERTICAL
STEEL STRUCTURE

EXHIBIT 15

PAPER SIZE: 8.5X11



SCALE: NTS

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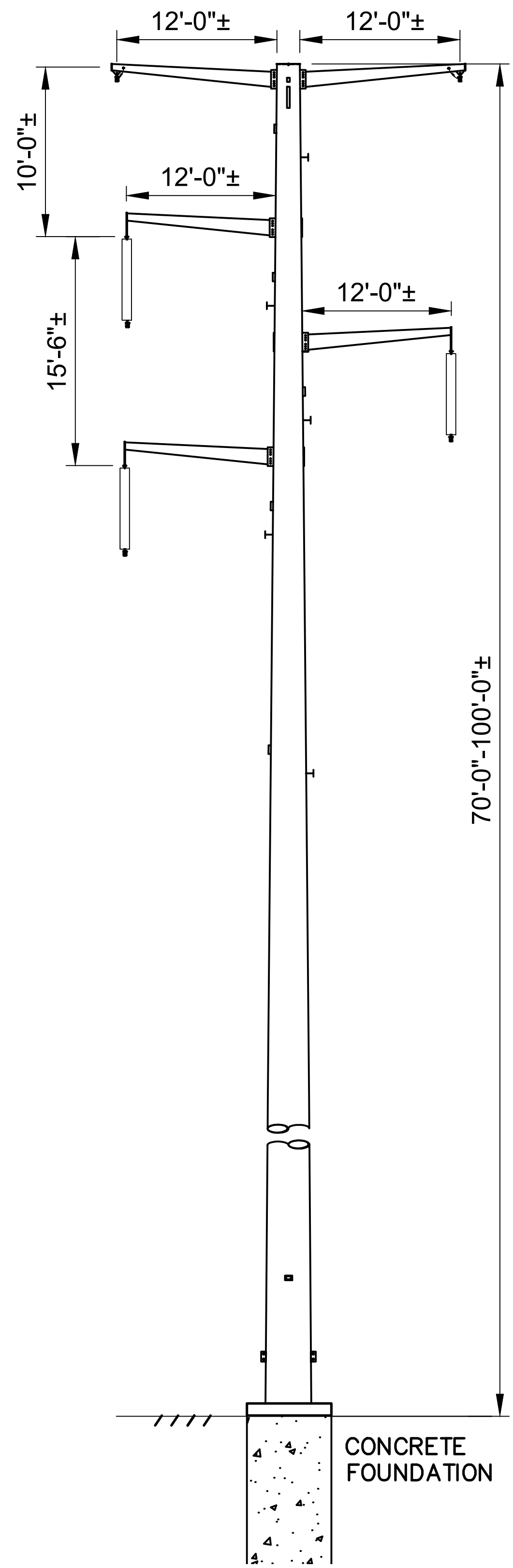
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

SINGLE CIRCUIT DEAD END VERTICAL TAP
STEEL STRUCTURE

EXHIBIT 16

PAPER SIZE: 8.5X11



SCALE: NTS

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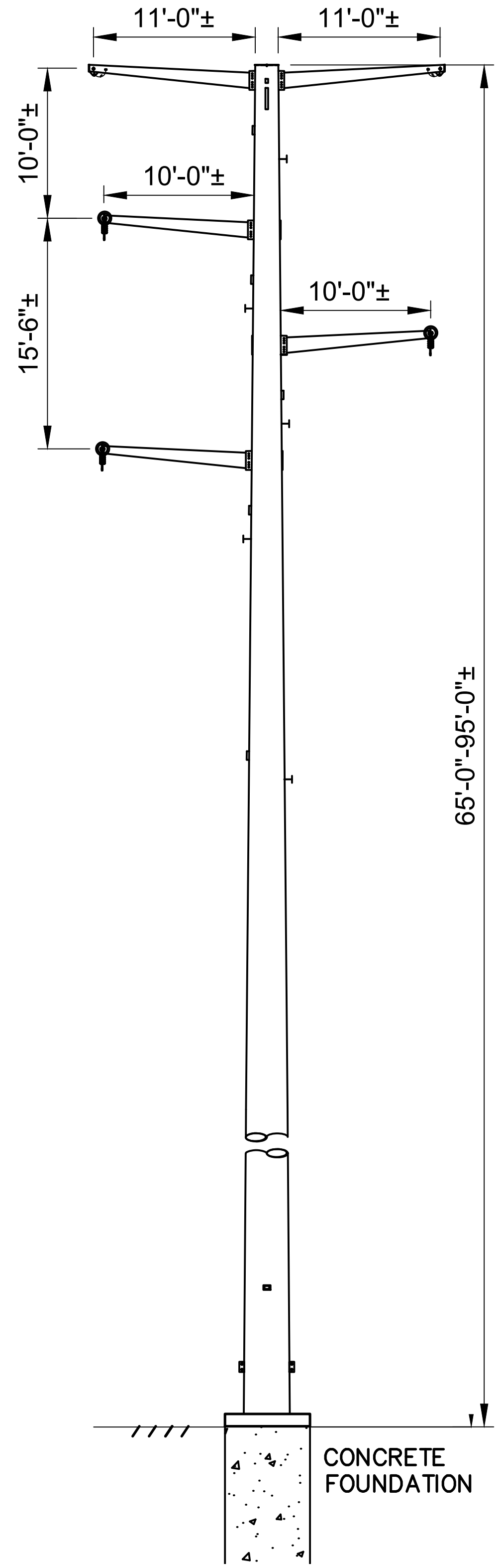
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

SINGLE CIRCUIT SUSPENSION DELTA
STEEL STRUCTURE

EXHIBIT 17

PAPER SIZE: 8.5X11



SCALE: NTS

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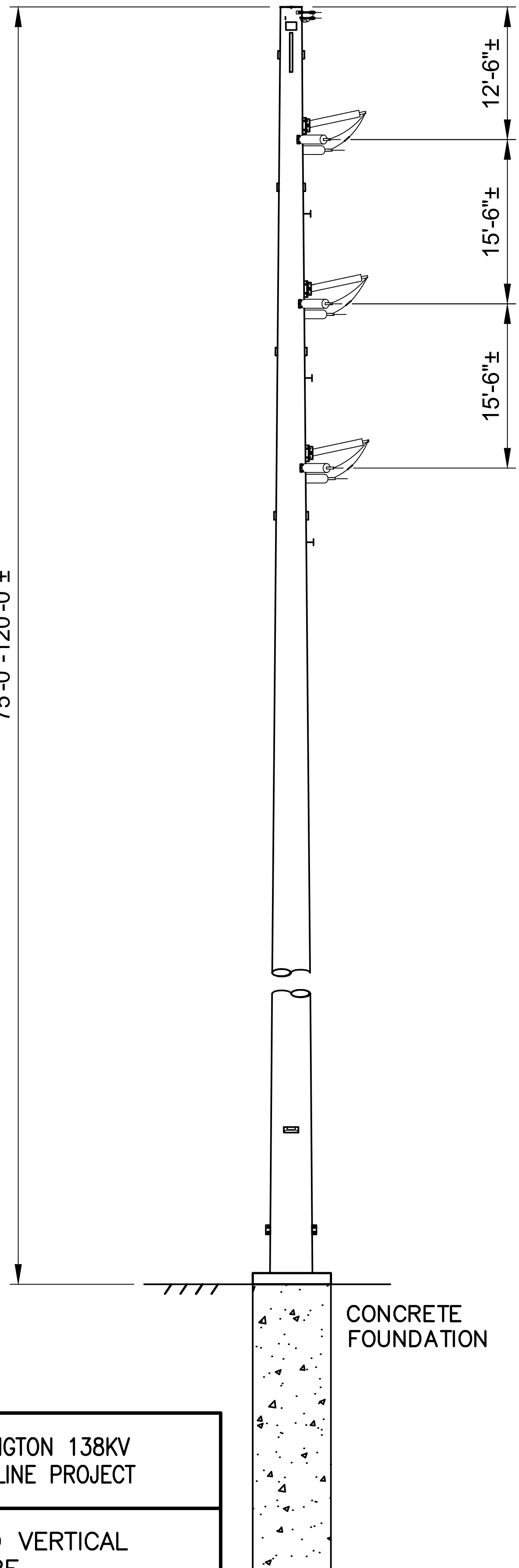
BEAVER-WELLINGTON 138KV
TRANSMISSION LINE PROJECT

SINGLE CIRCUIT DEAD END DELTA
STEEL STRUCTURE

EXHIBIT 18

PAPER SIZE: 8.5X11



SCALE: NTS

ATSI
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BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

SINGLE CIRCUIT DEADEND VERTICAL
STEEL STRUCTURE

EXHIBIT 19

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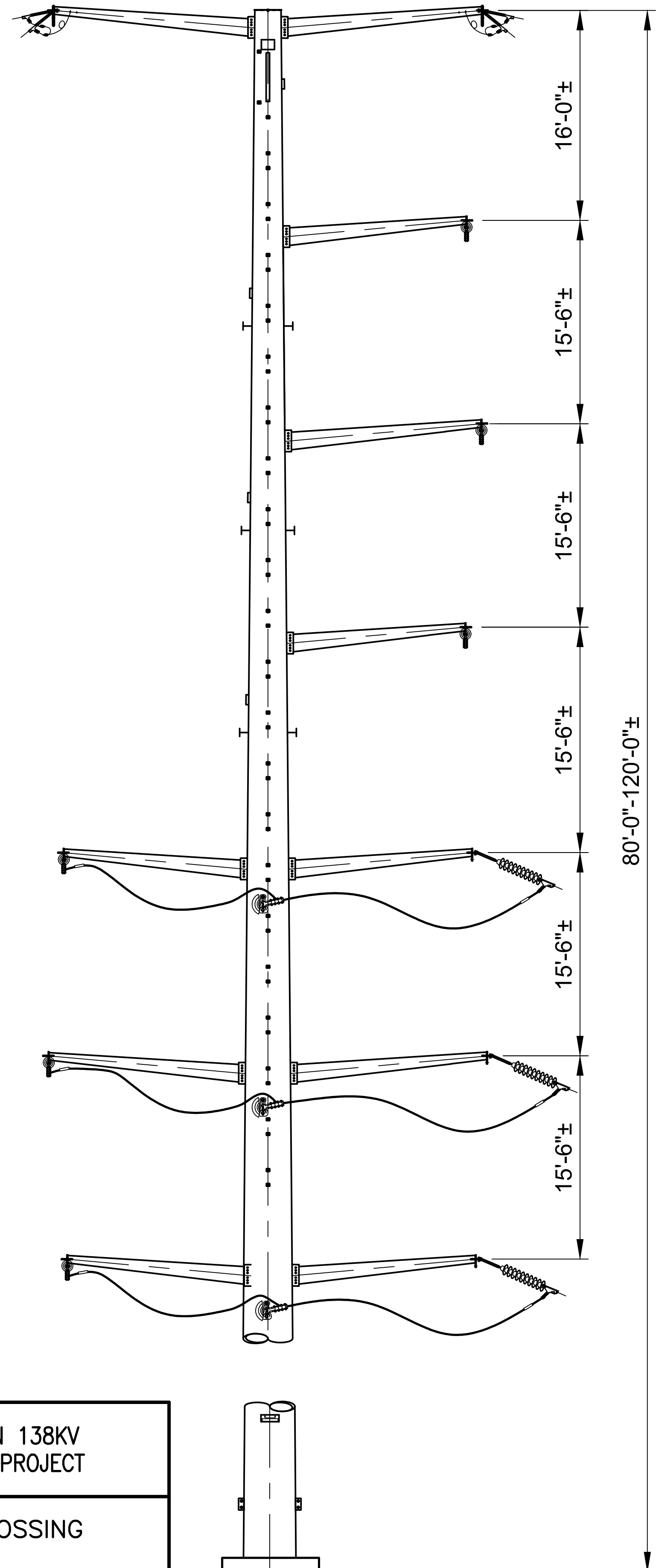

SCALE: NTS

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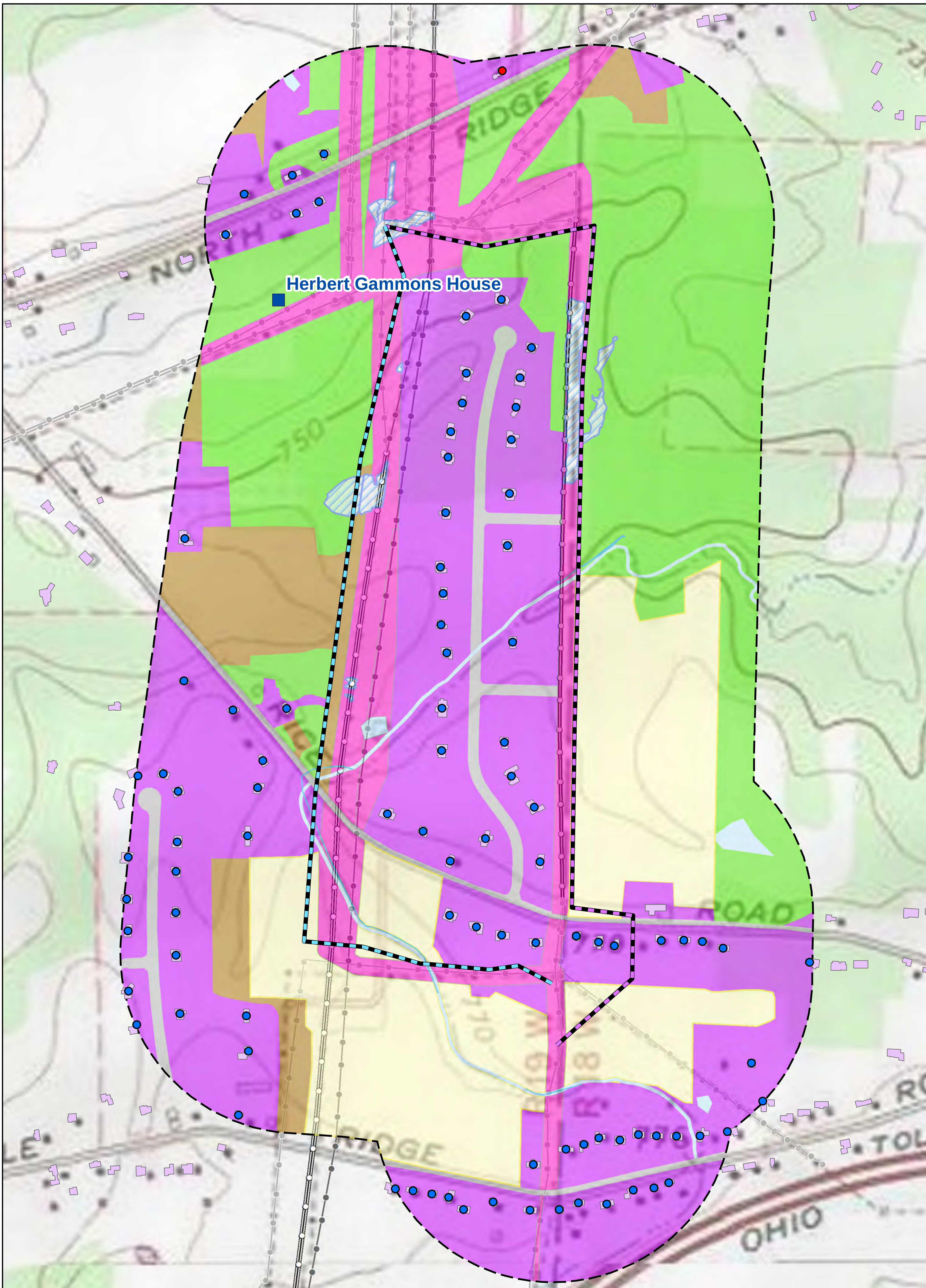
BEAVER–WELLINGTON 138KV
TRANSMISSION LINE PROJECT

DOUBLE CIRCUIT SPECIAL CROSSING
STEEL STRUCTURE

EXHIBIT 20

PAPER SIZE: 8.5X11



LEGEND:

Preferred_and_Alternate_1000ft_...

Existing Transmission

- 138kV
- 345kV
- Double Circuit - 138kV/345kV
- Double Circuit - 138kV
- Preferred Route
- Alternate Route

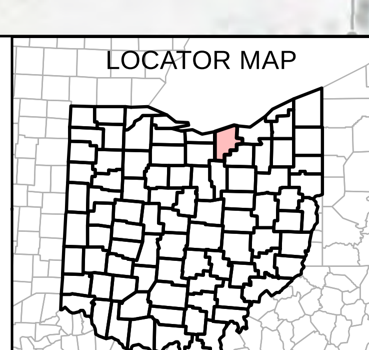
Land Use Type

- Agricultural
- Delineated Stream
- Delineated Wetland
- Herbaceous
- Residential
- ROW
- Woodlot
- Water Resources
- Pavement

Structure Type

- Commercial
- Residential
- Historic Structure

LOCATOR MAP



N

BASE MAP SOURCE:
Esri USA Topo Map

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Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 7-1
Land Use Overview Map

0 500 1,000
FEET

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_7-1_LANDUSE_OVERVIEW.MXD DG066919 8/17/2020

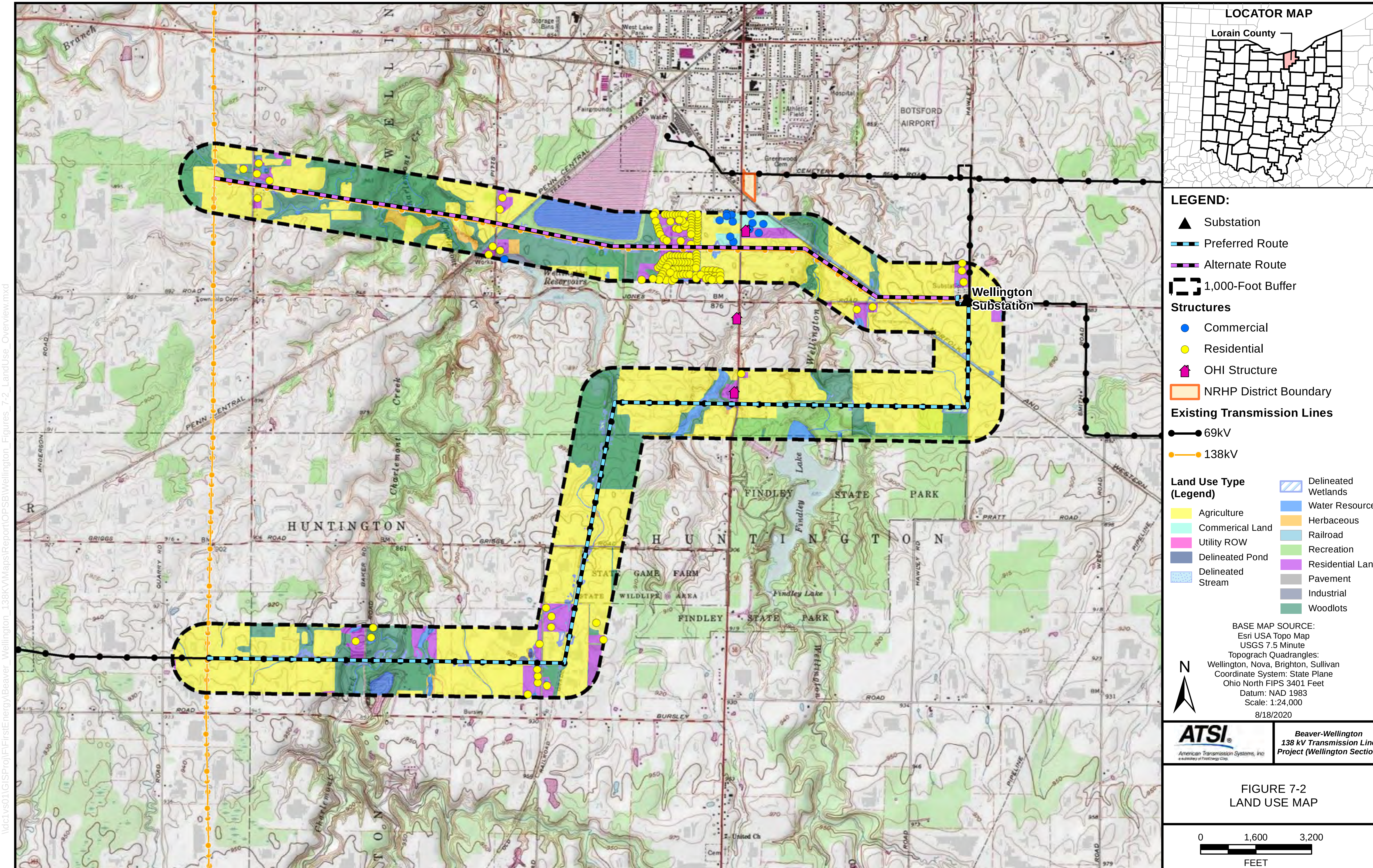
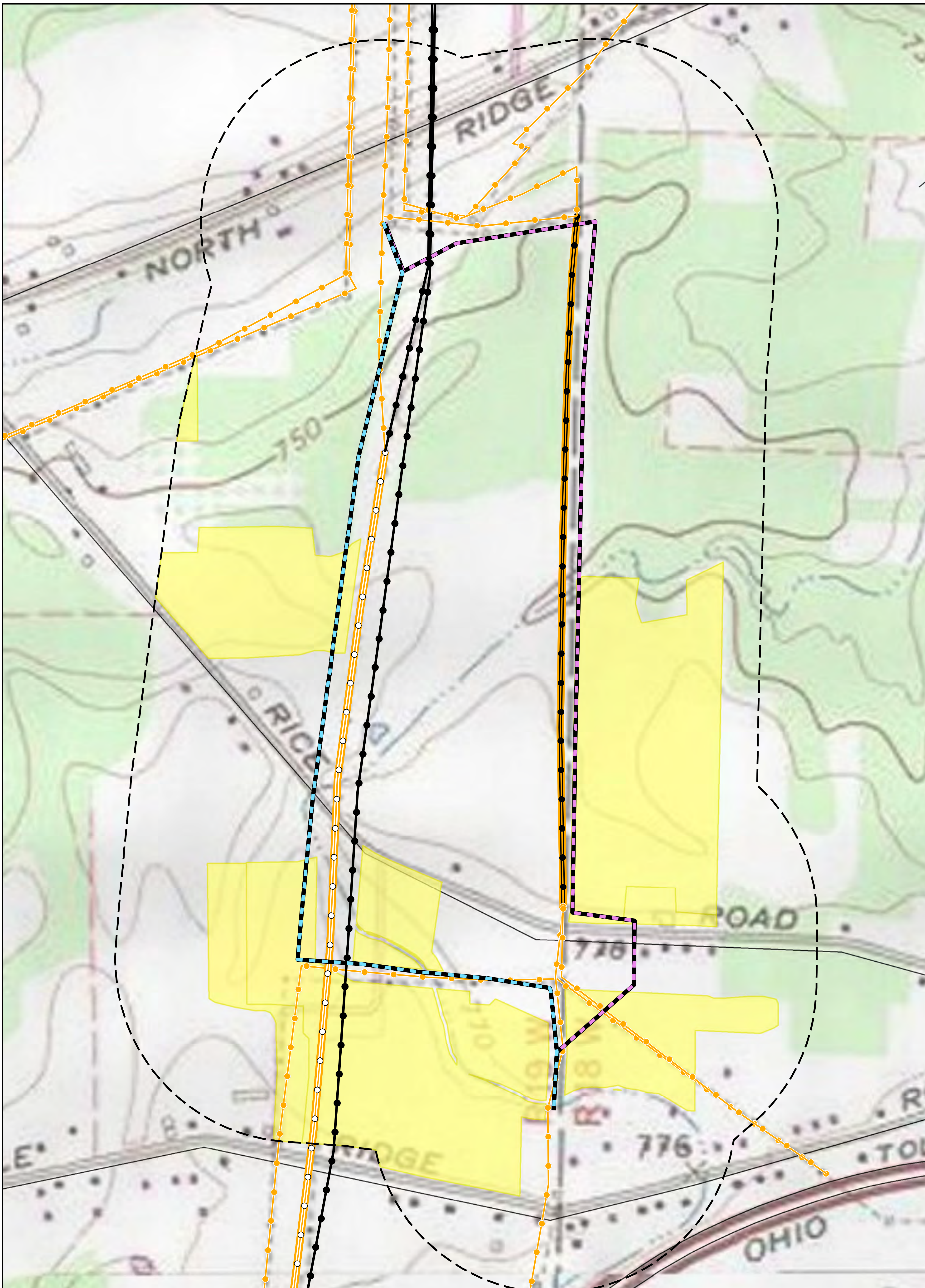


FIGURE 7-2
LAND USE MAP



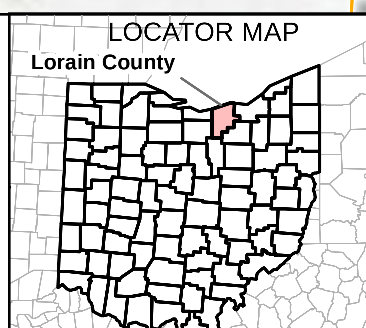
LEGEND:

- Preferred Route
- Alternate Route
- 1,000-Foot Buffer
- Agricultural Land Use

Existing Transmission Lines

- 138kV
- 345kV
- Double Circuit - 138kV/345kV
- Double Circuit - 138kV
- Streets

LOCATOR MAP



BASE MAP SOURCE:
Esri USA Topo Map
USGS 7.5 Minute
Topographic Quadrangles:
Vermilion East

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale 1:24,000

7/15/2020

N

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Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

FIGURE 7-3
AGRICULTURAL LAND USE MAP

0 125 250 500
FEET

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_7-2_AGLAND.MXD DG066919 7/15/2020

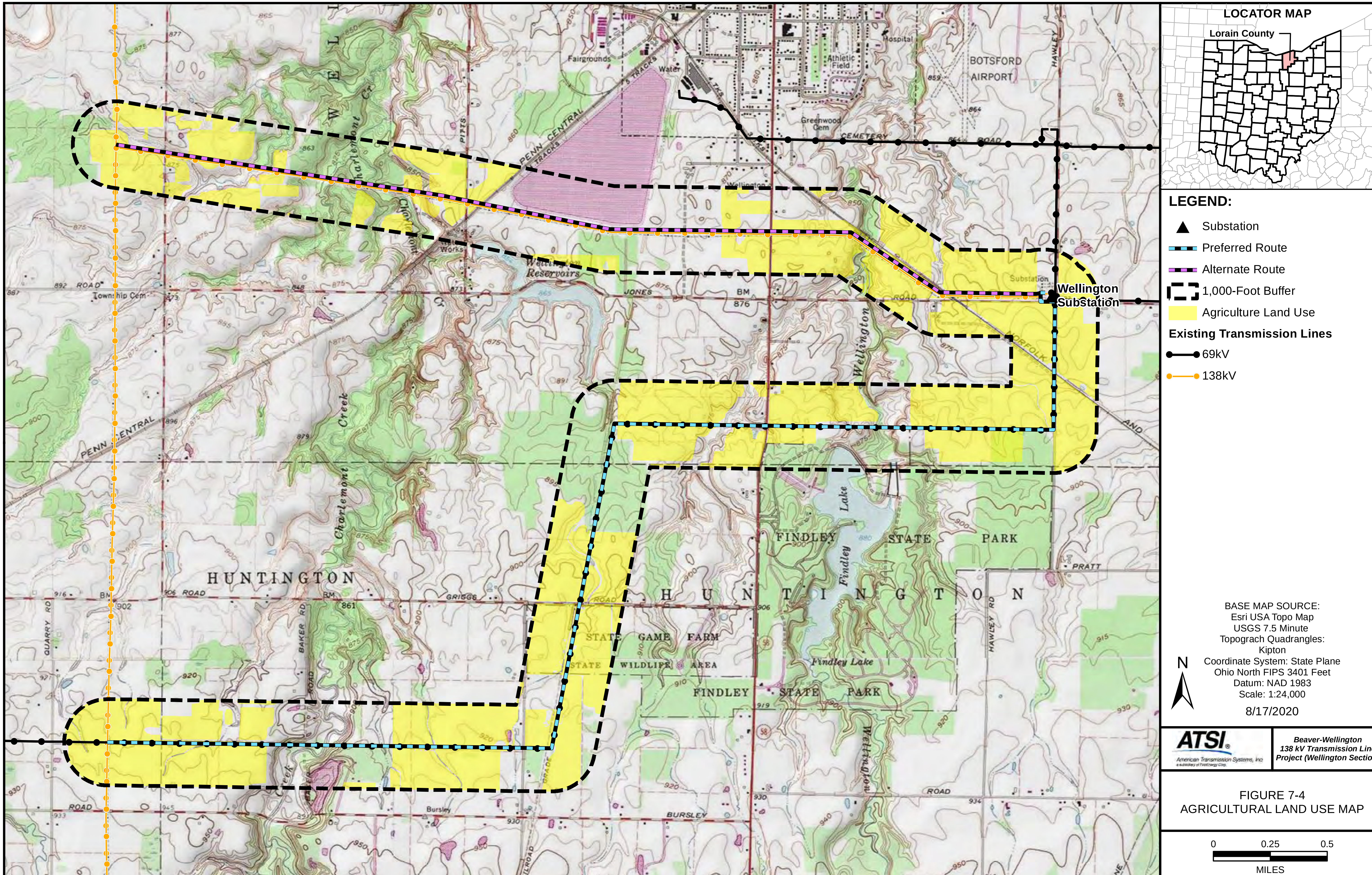
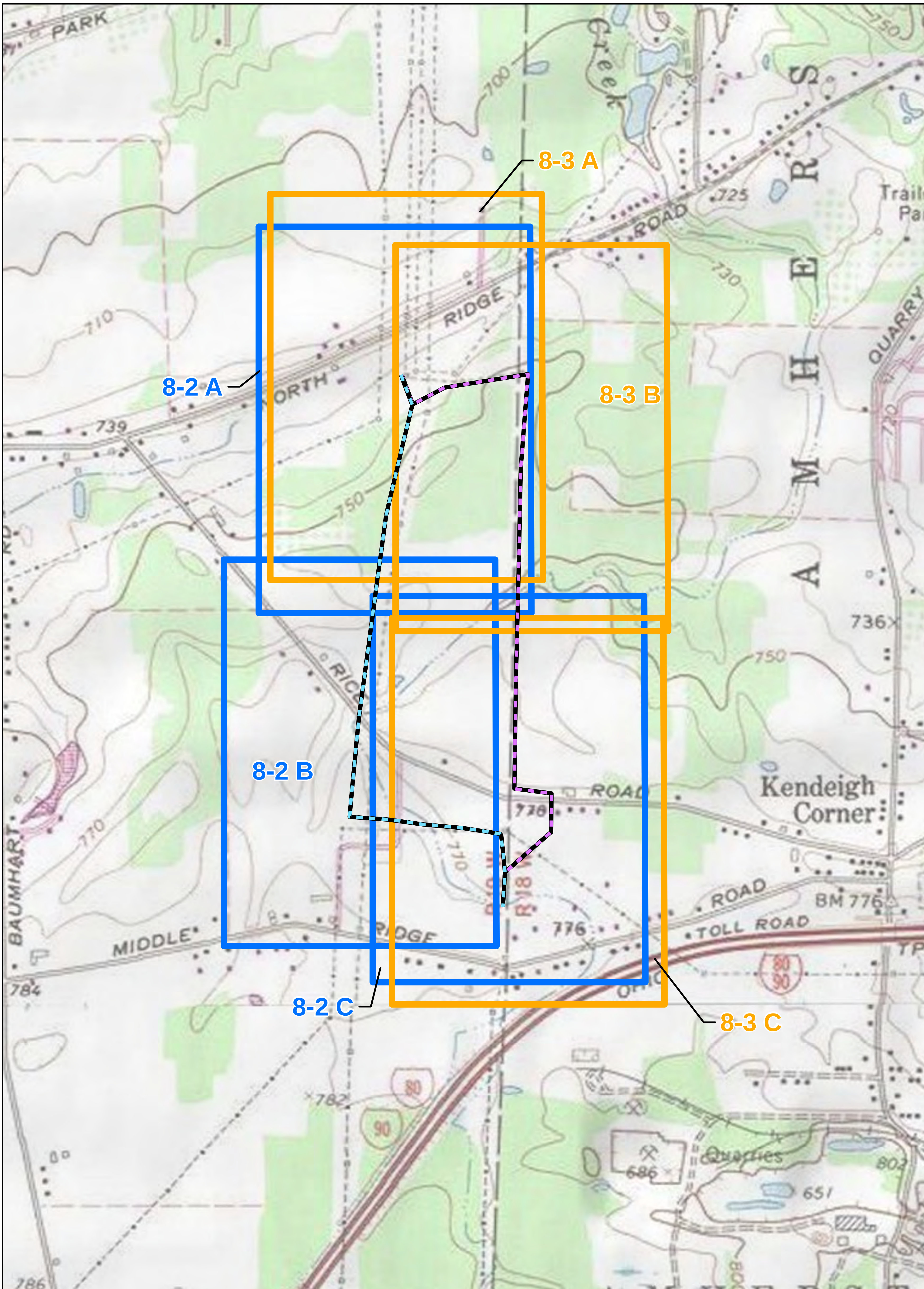


FIGURE 7-4
AGRICULTURAL LAND USE MAP



LEGEND:

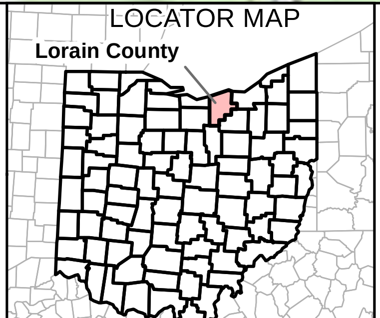
Preferred Route

Alternate Route

Figure Key

8-2

8-3



BASE MAP SOURCE:
Esri USA Topo Map
USGS 7.5 Minute
Topographic Quadrangles:
Vermilion East

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:6,000

8/17/2020

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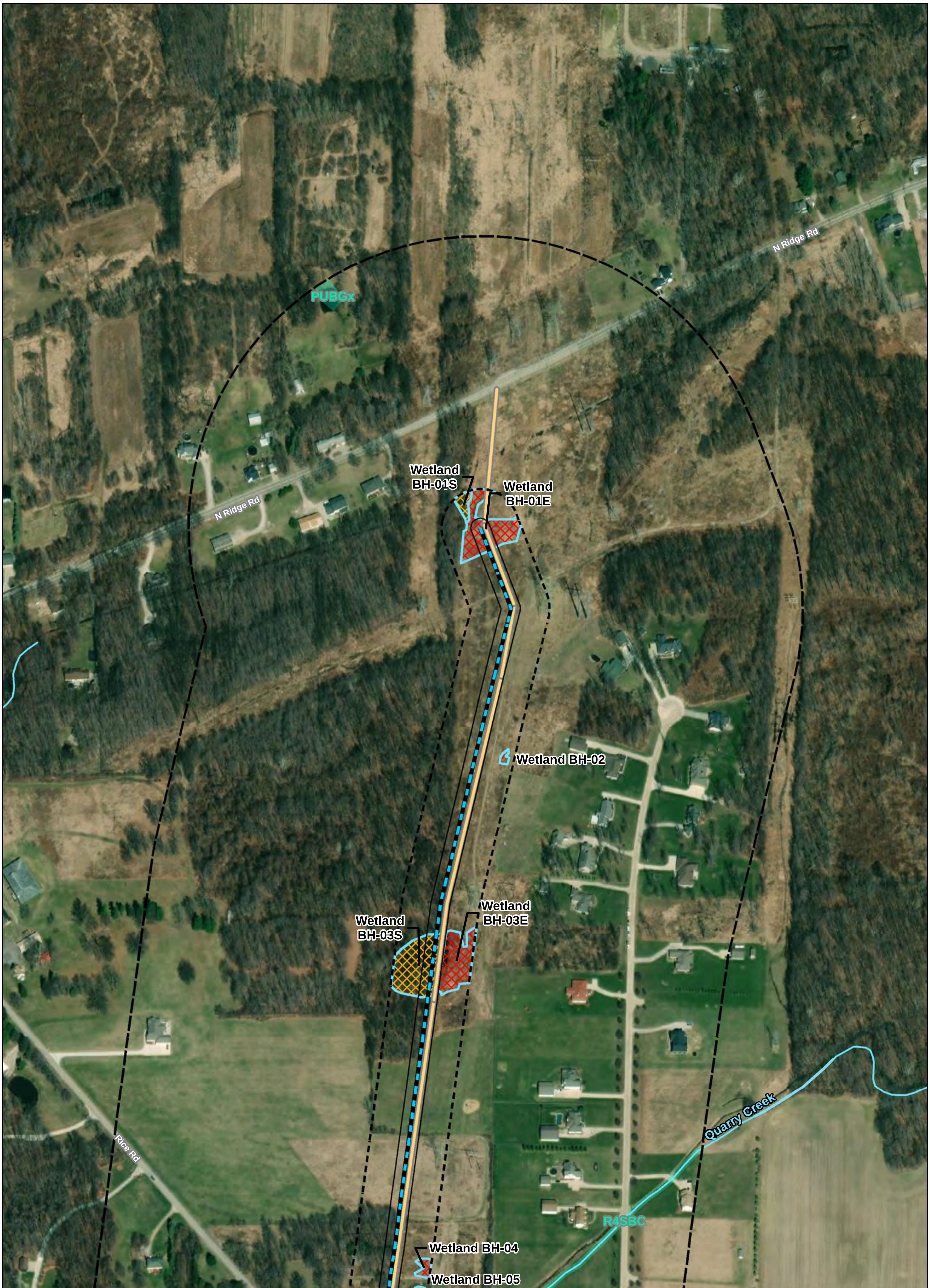
Beaver-Wellington
138 kV Transmission Line
Project (Brownhelm Section)

FIGURE 8-1
WETLAND AND WATERBODY
OVERVIEW MAP

0 400 800
FEET

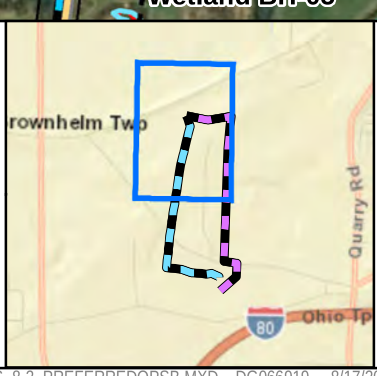
\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-1_OVERVIEW.MXD DG066919 7/15/2020



LEGEND:

- Preferred Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope



BASE MAP SOURCE:
Esri World Imagery

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/26/2020

N

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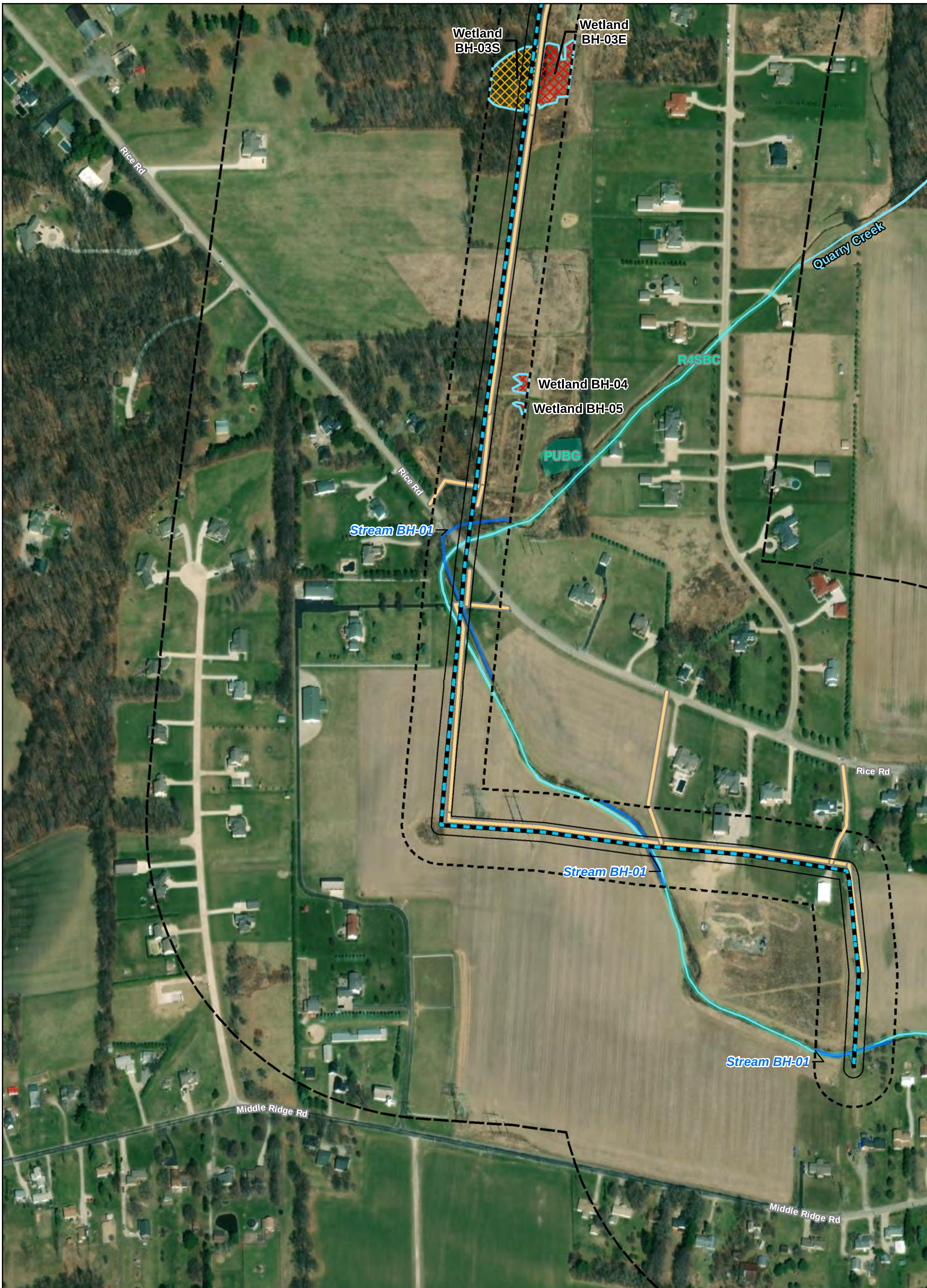
FIGURE 8-2 A
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 300 600
FEET

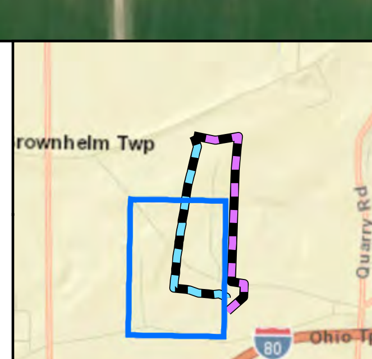
\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-2_PREFERREDOPSB.MXD DG066919 8/17/2020



LEGEND:

- Preferred Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope



BASE MAP SOURCE:
Esri World Imagery

N

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/26/2020

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Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

FIGURE 8-2 B
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

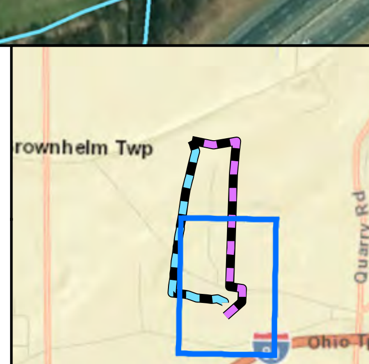
0 300 600
FEET

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-2_PREFERREDOPSB.MXD DG066919 8/17/2020

LEGEND:

- Preferred Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope



N

BASE MAP SOURCE:
Esri World Imagery

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/26/2020

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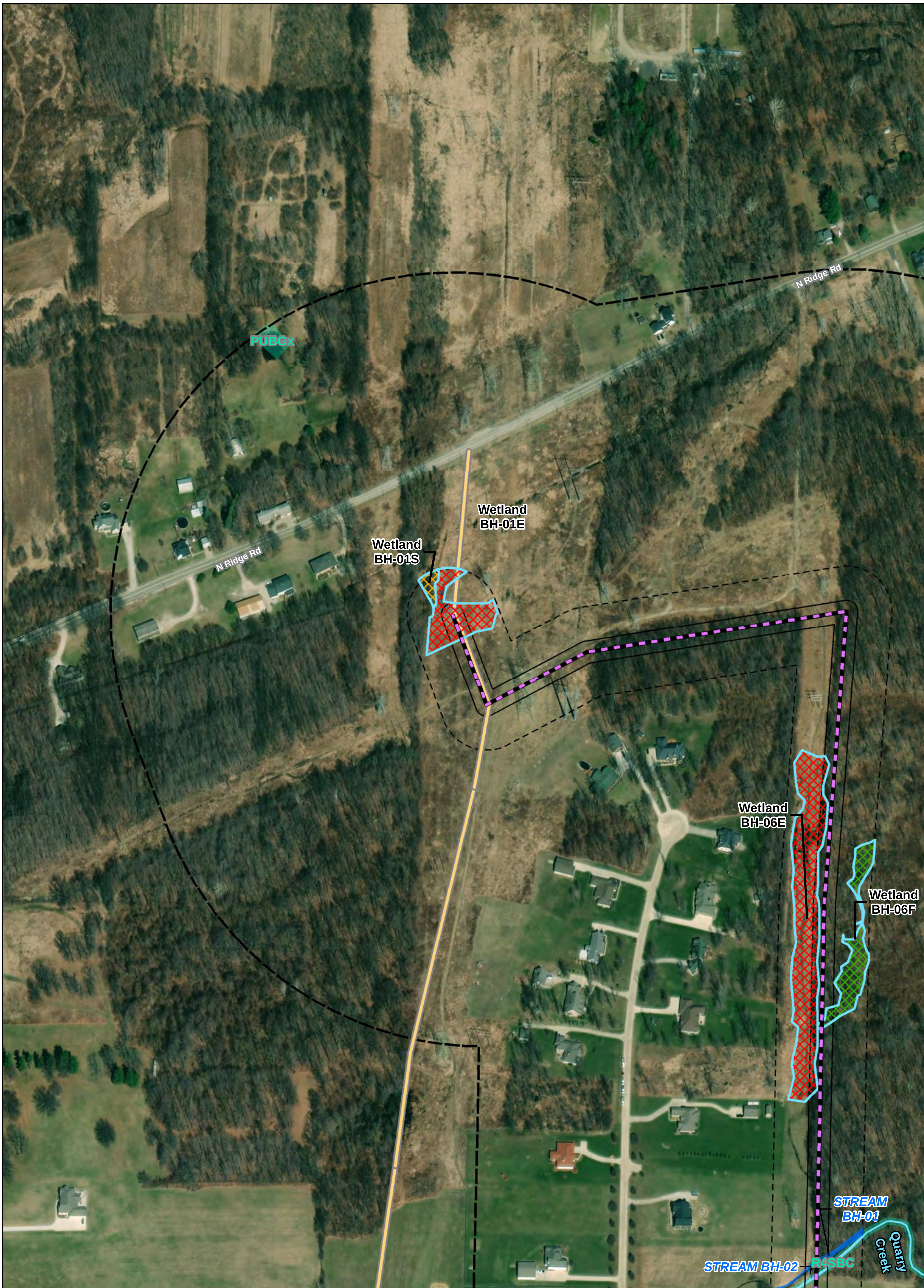
American Transmission Systems, Inc.

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

FIGURE 8-2 C
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 300 600
FEET

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-2_PREFERREDOPSB.MXD DG066919 8/17/2020



LEGEND:

- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope

N

BASE MAP SOURCE:
Esri World Imagery

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/17/2020

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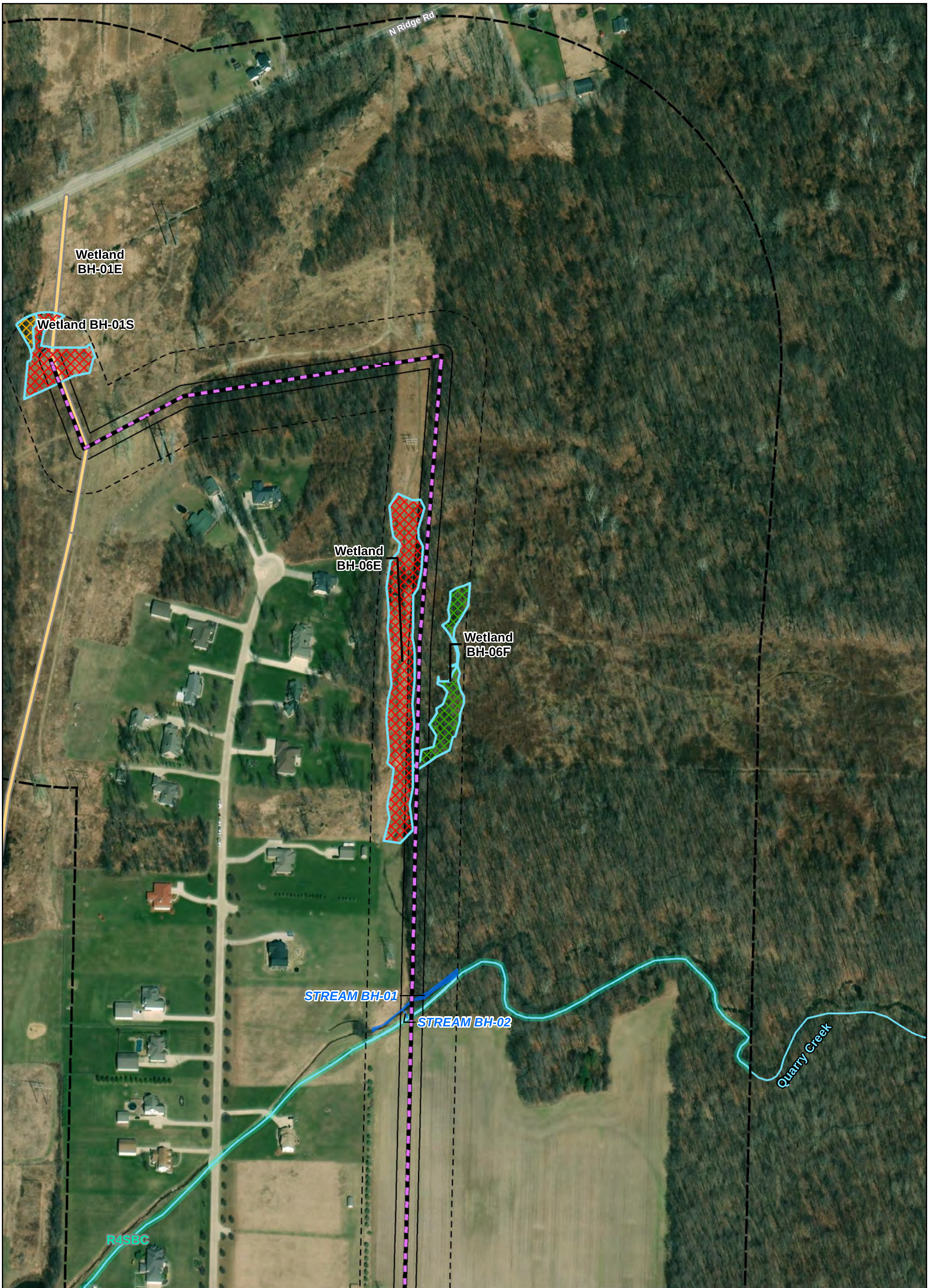
Beaver-Wellington
138 kV Transmission Line
Project (Brownhelm Section)

FIGURE 8-3 A
ALTERNATE ROUTE DELINEATED
WETLAND AND WATERBODIES MAP

0 300 600
FEET

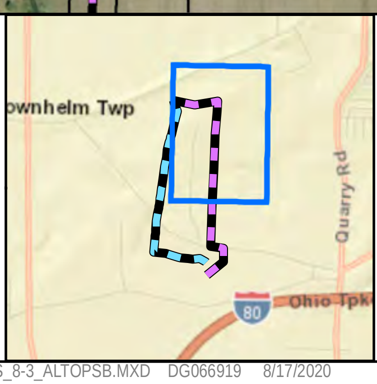
\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-3_ALTOPSB.MXD DG066919 8/17/2020



LEGEND:

- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope



N

BASE MAP SOURCE:
Esri World Imagery

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/17/2020

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Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

FIGURE 8-3 B
ALTERNATE ROUTE DELINEATED
WETLAND AND WATERBODIES MAP

0 300 600
FEET

\\DC1VS01\GISPROJ\F\FIRSTENERGY\BEAVER_HENRIETTA\MAPS\REPORT\OPSB\HENRIETTA_FIGURES_8-3_ALTOPSB.MXD DG066919 8/17/2020

LEGEND:

- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1,000-Foot Buffer
- Stream (NHD)
- Wetland (NWI)
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland

*No soil units exceed 12 percent slope

BASE MAP SOURCE:
Esri World Imagery

N

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:2,400

8/17/2020

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Beaver-Wellington
138 kV Transmission Line
Project (Brownhelm Section)

FIGURE 8-3 C
ALTERNATE ROUTE DELINEATED
WETLAND AND WATERBODIES MAP

0 300 600
FEET

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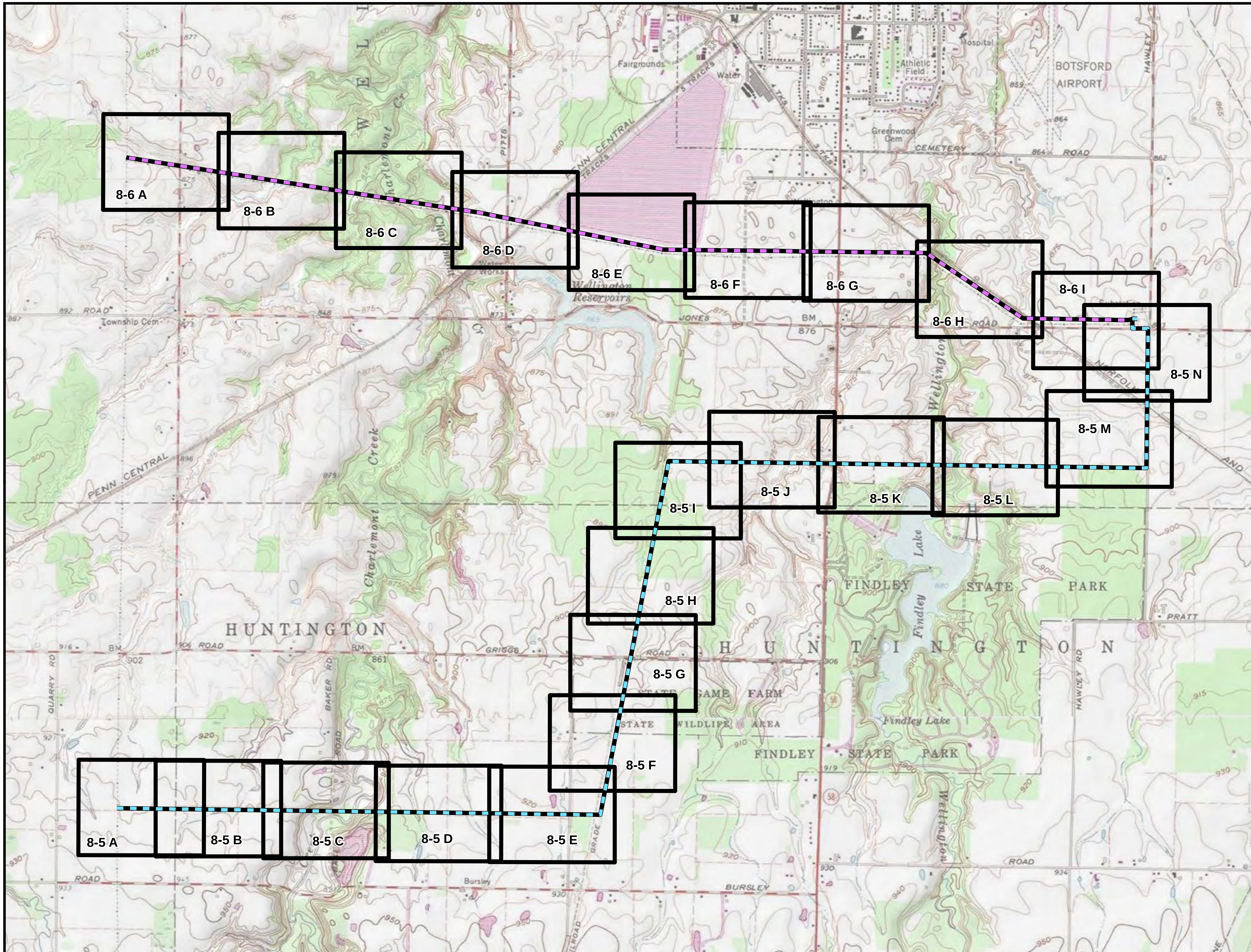
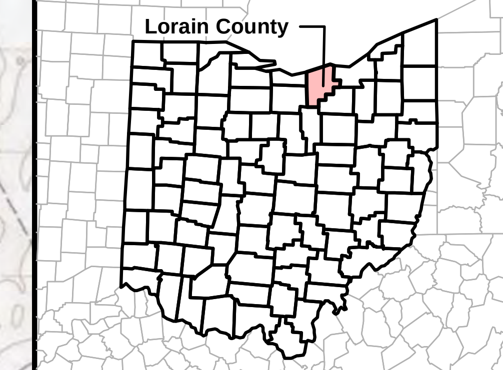


LOCATOR MAP



LEGEND:

- Substation
- Preferred Route
- Alternate Route
- Figure Key

BASE MAP SOURCE:
Esri USA Topo Map
USGS 7.5 Minute
Topograch Quadrangles:
Kipton

Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:24,000

N

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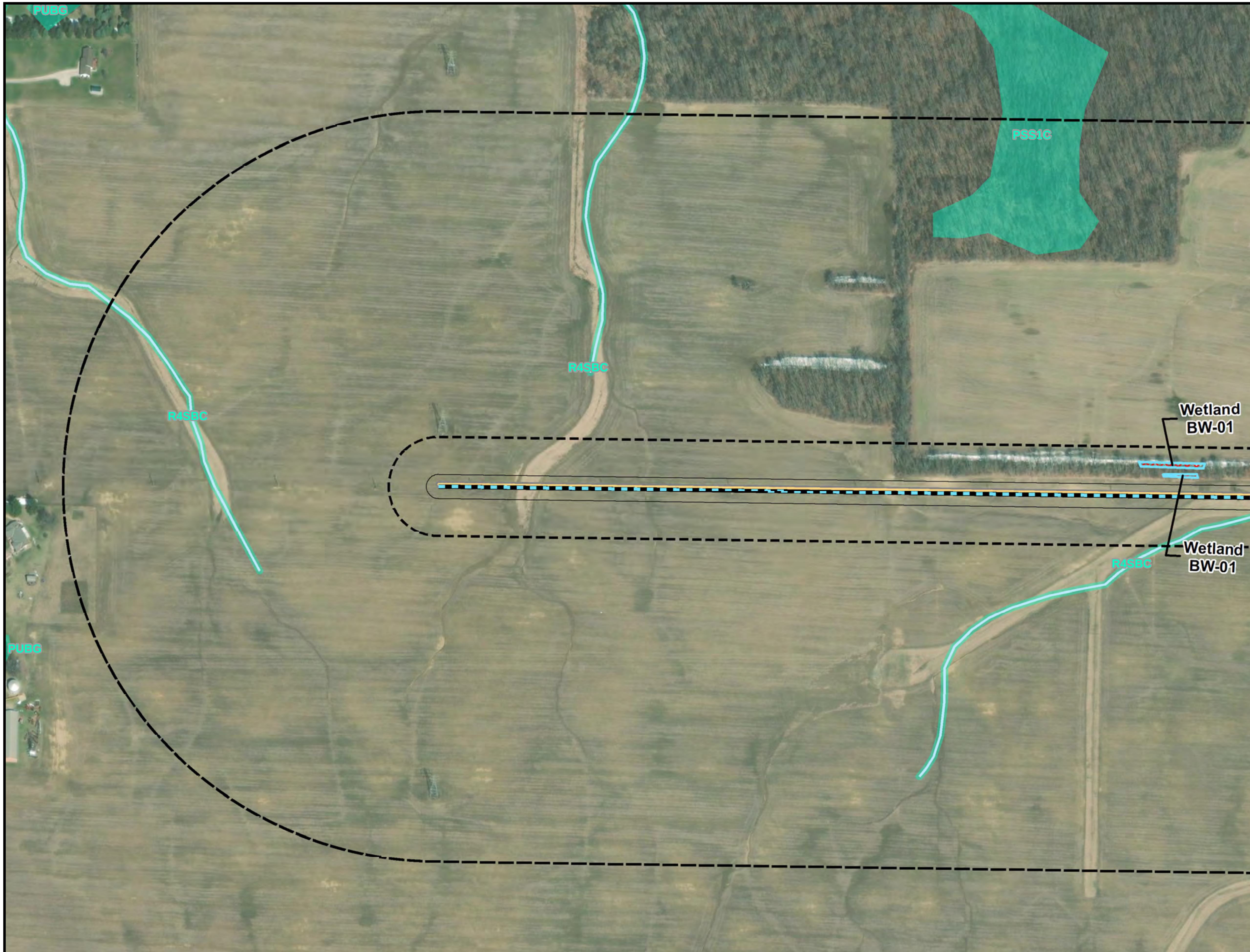
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-4
WETLAND AND WATERBODY
OVERVIEW MAP

0 1,600 3,200
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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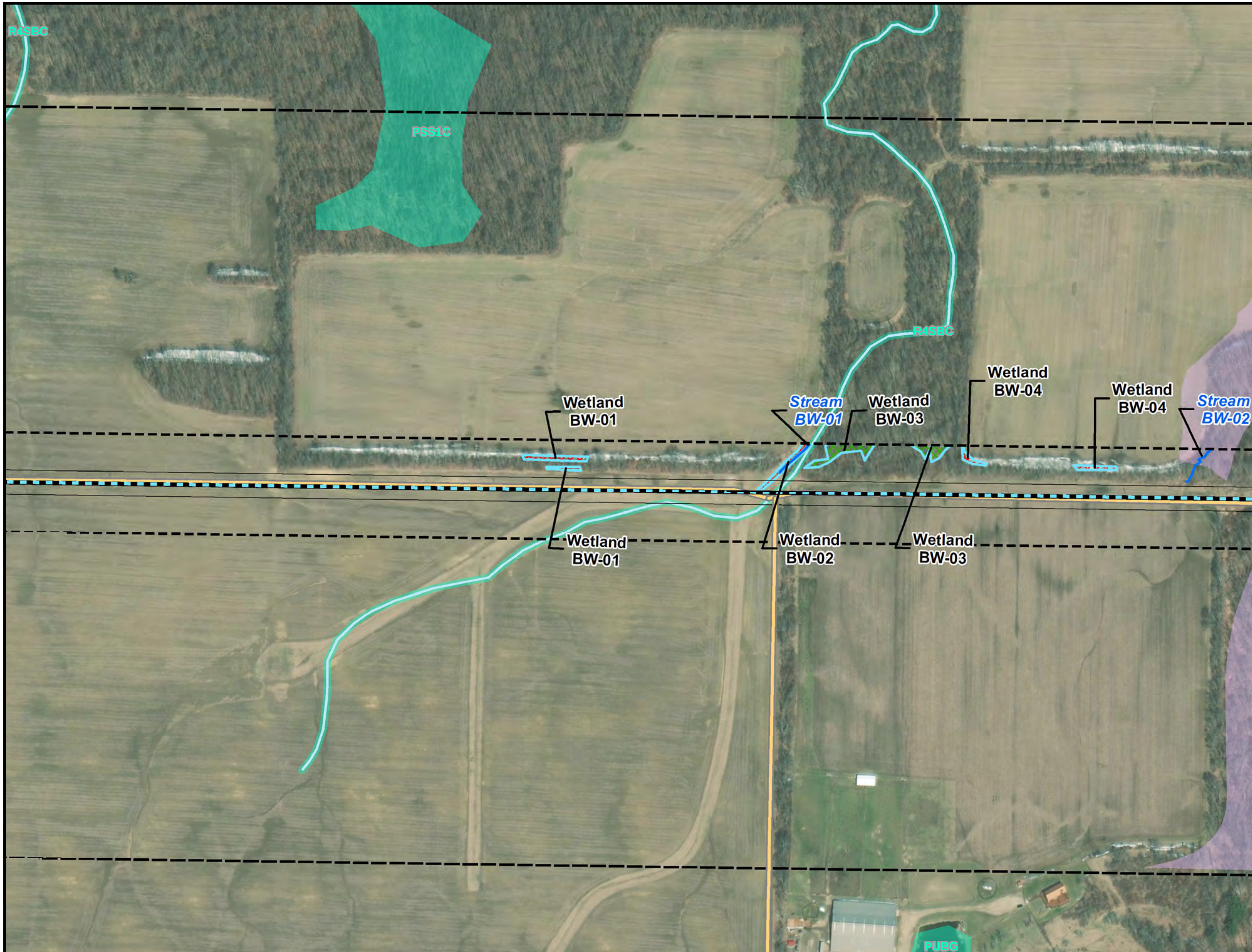
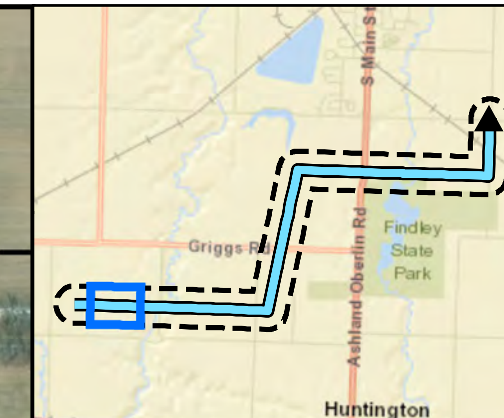
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 A
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET





LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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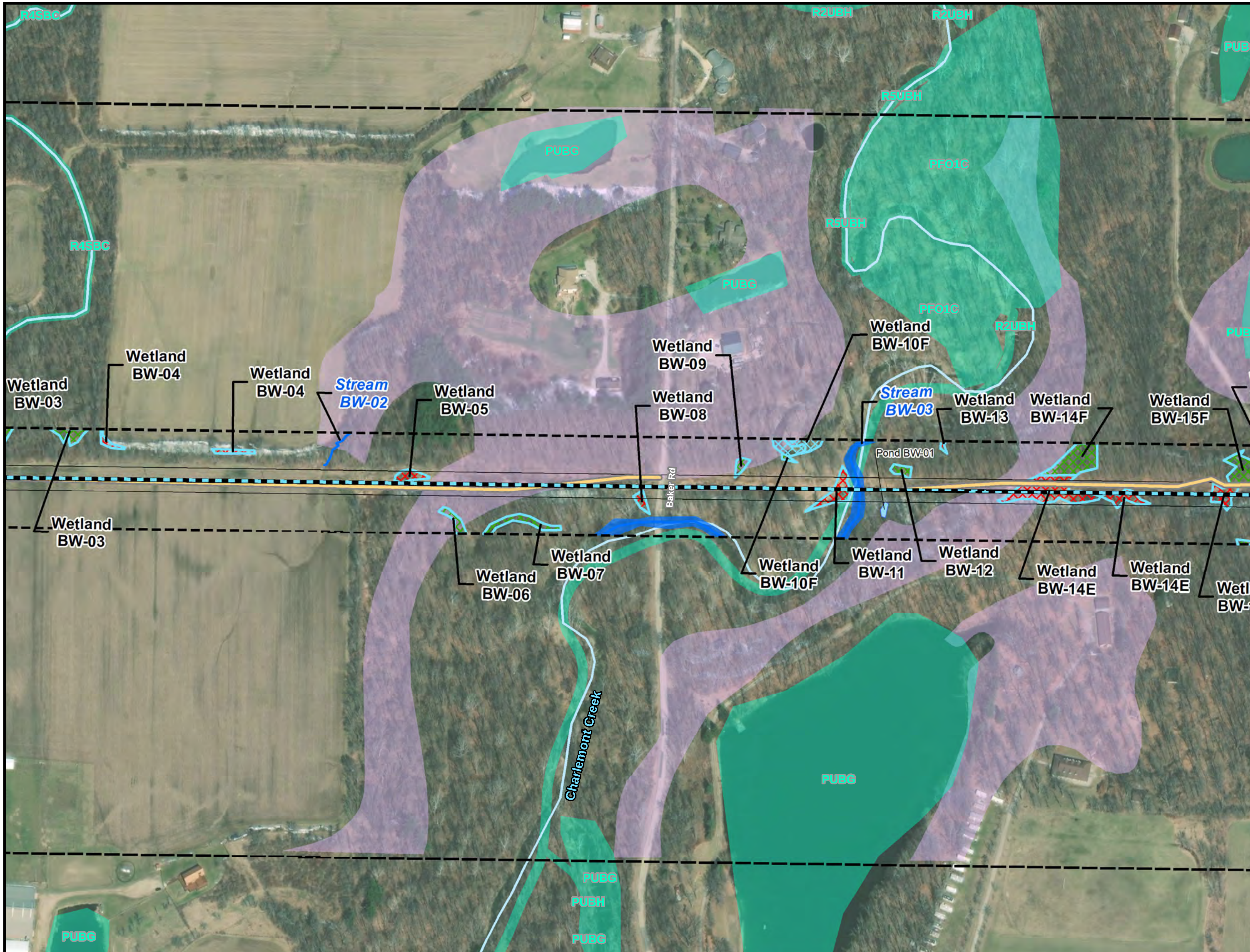
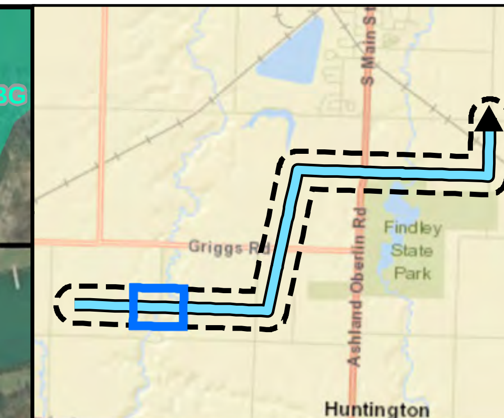
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 B
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET





LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 C
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

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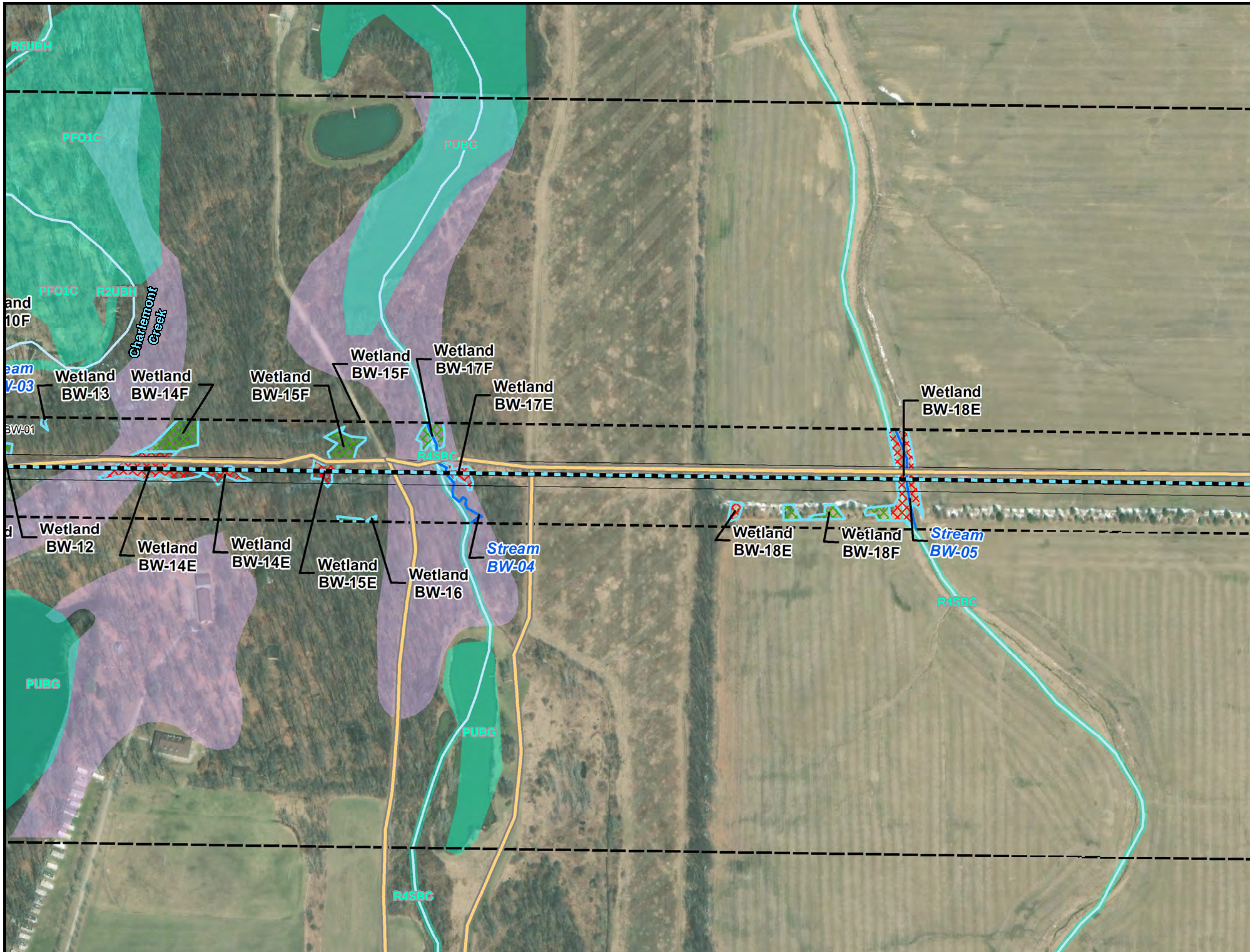

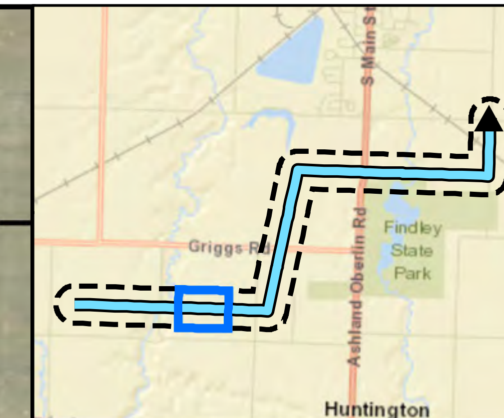

LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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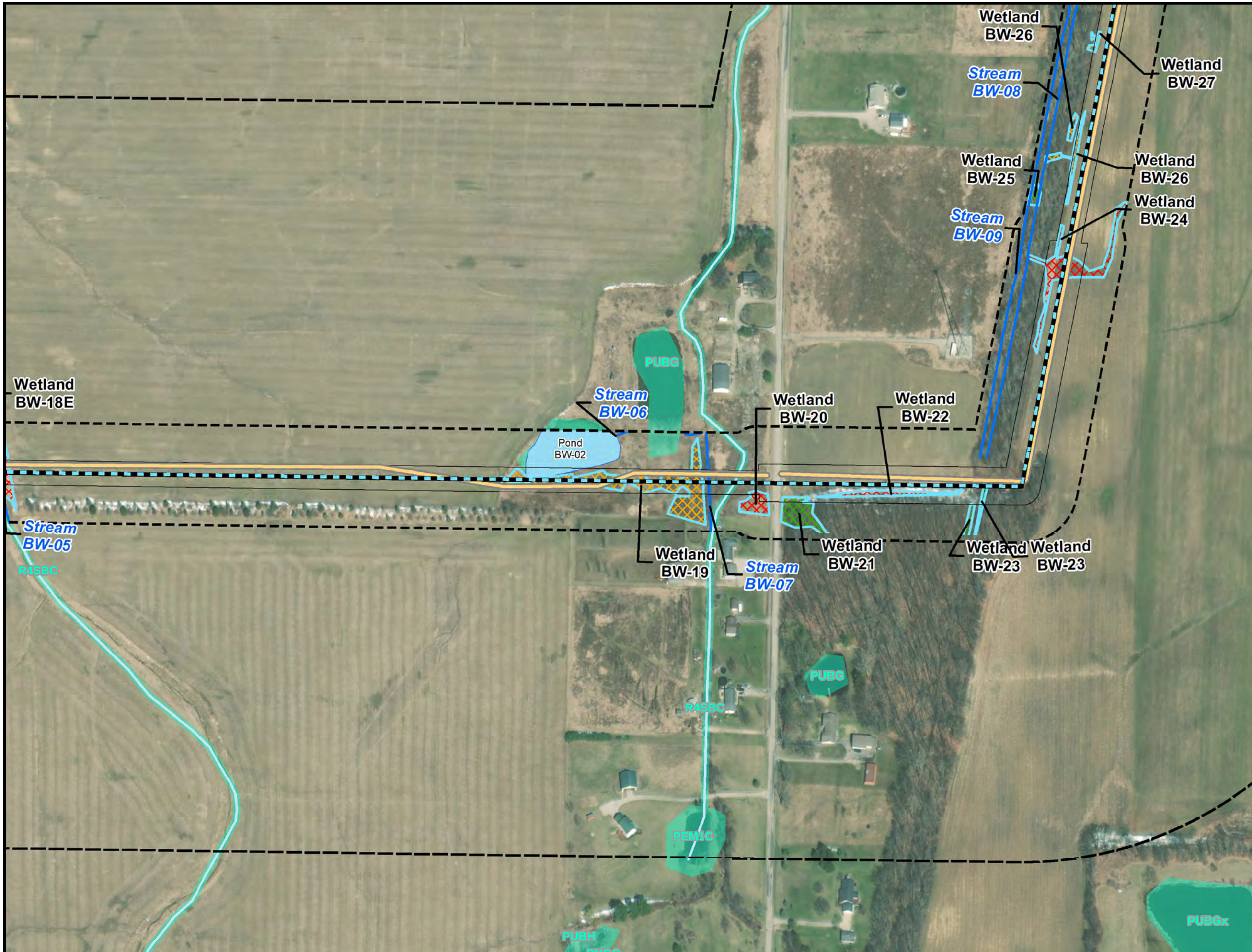
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 D
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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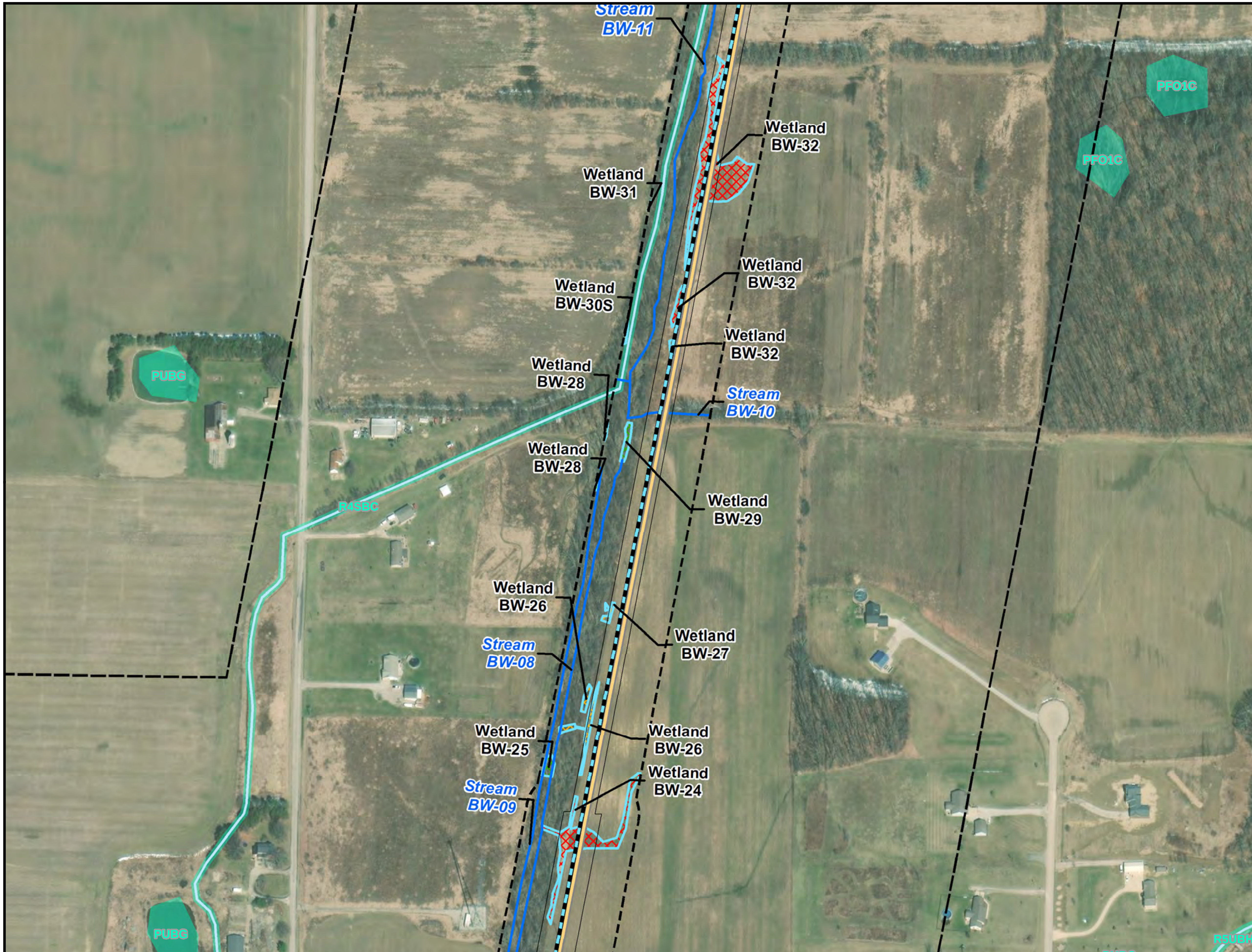
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 E
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 F
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

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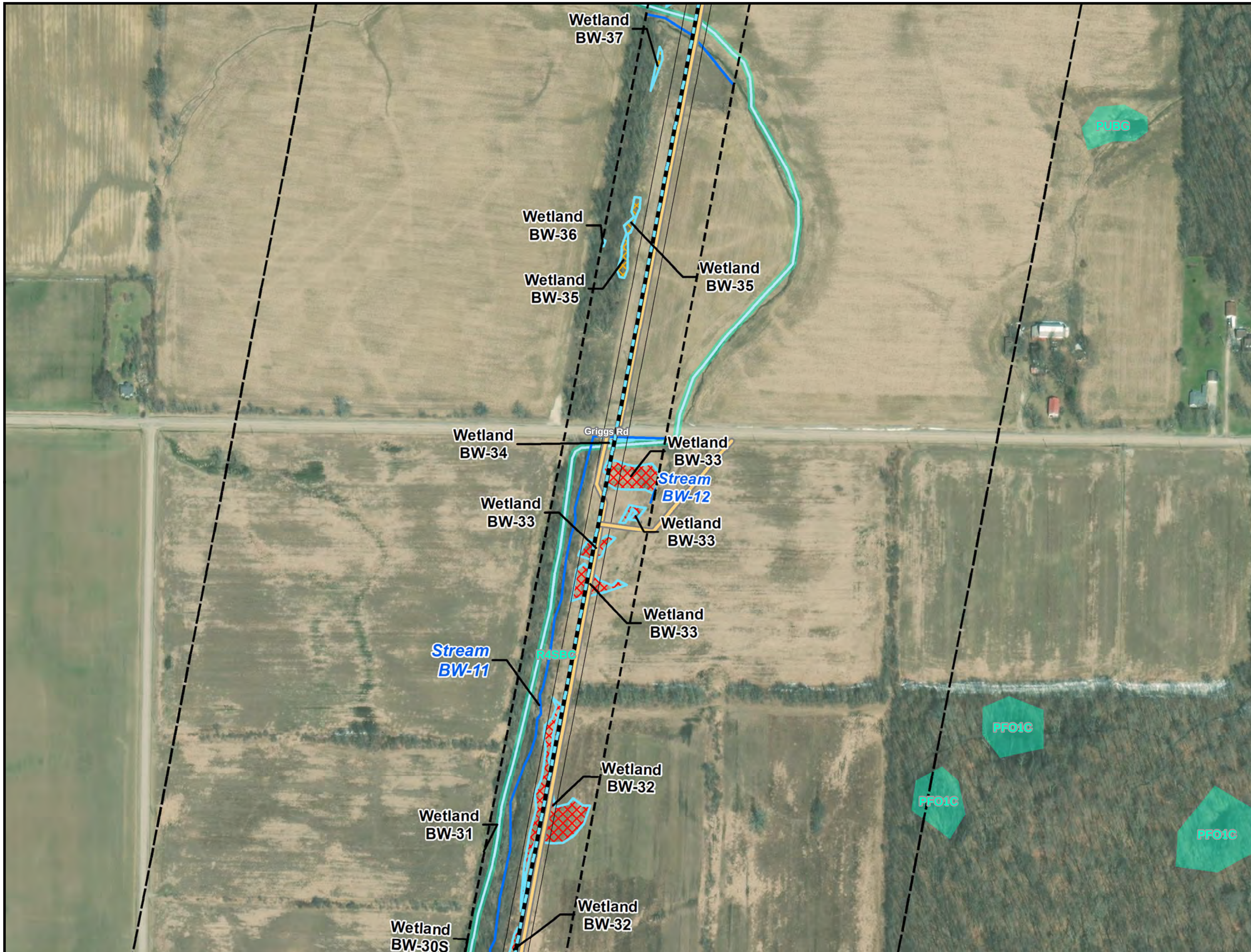

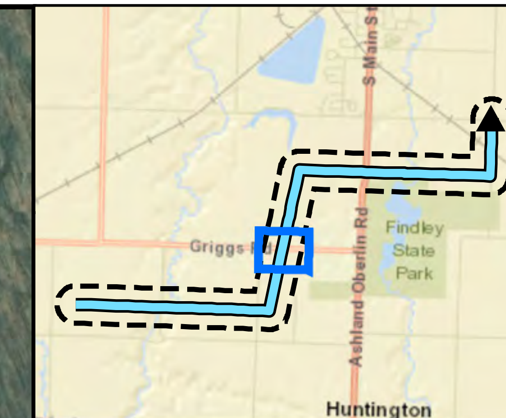

LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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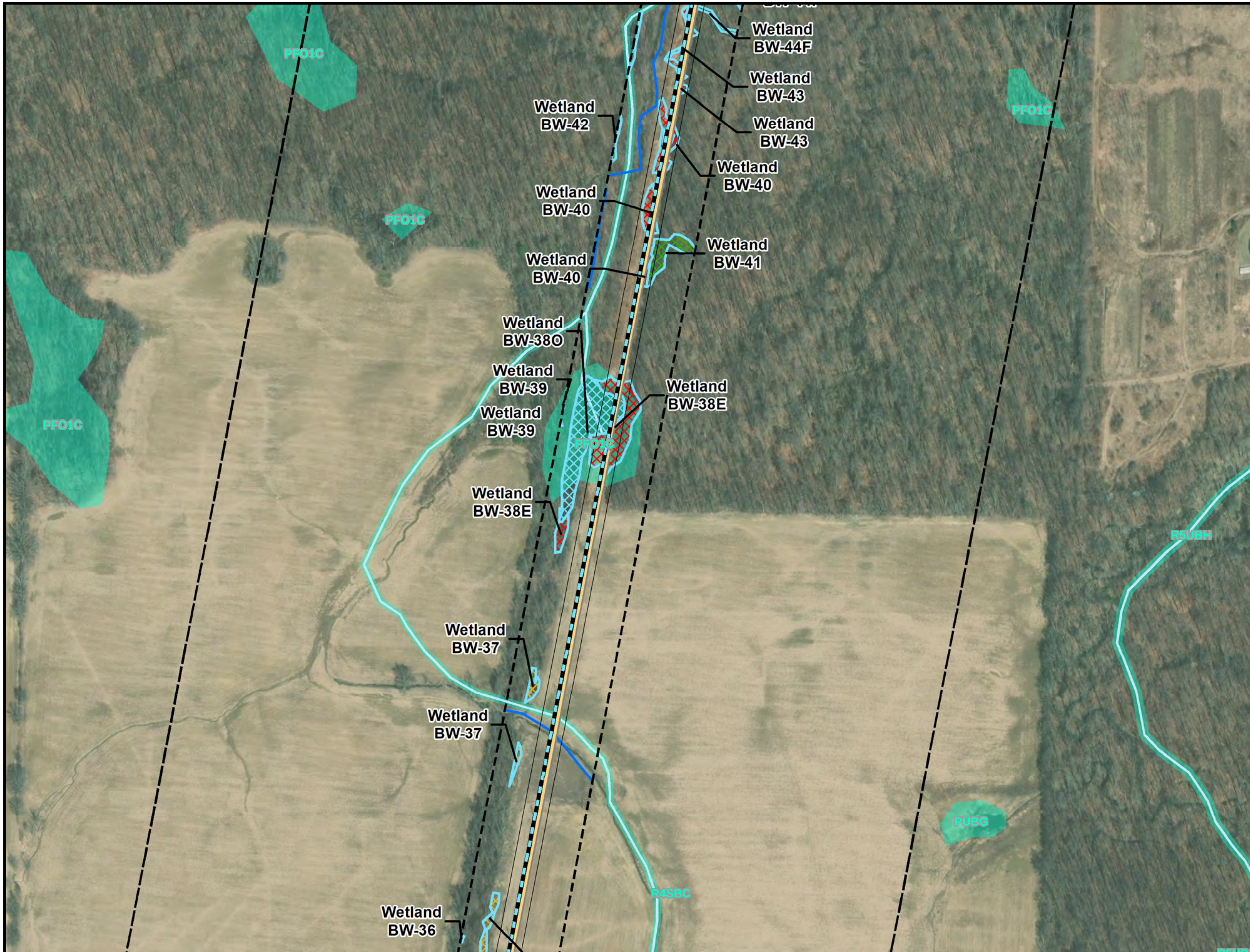
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 G
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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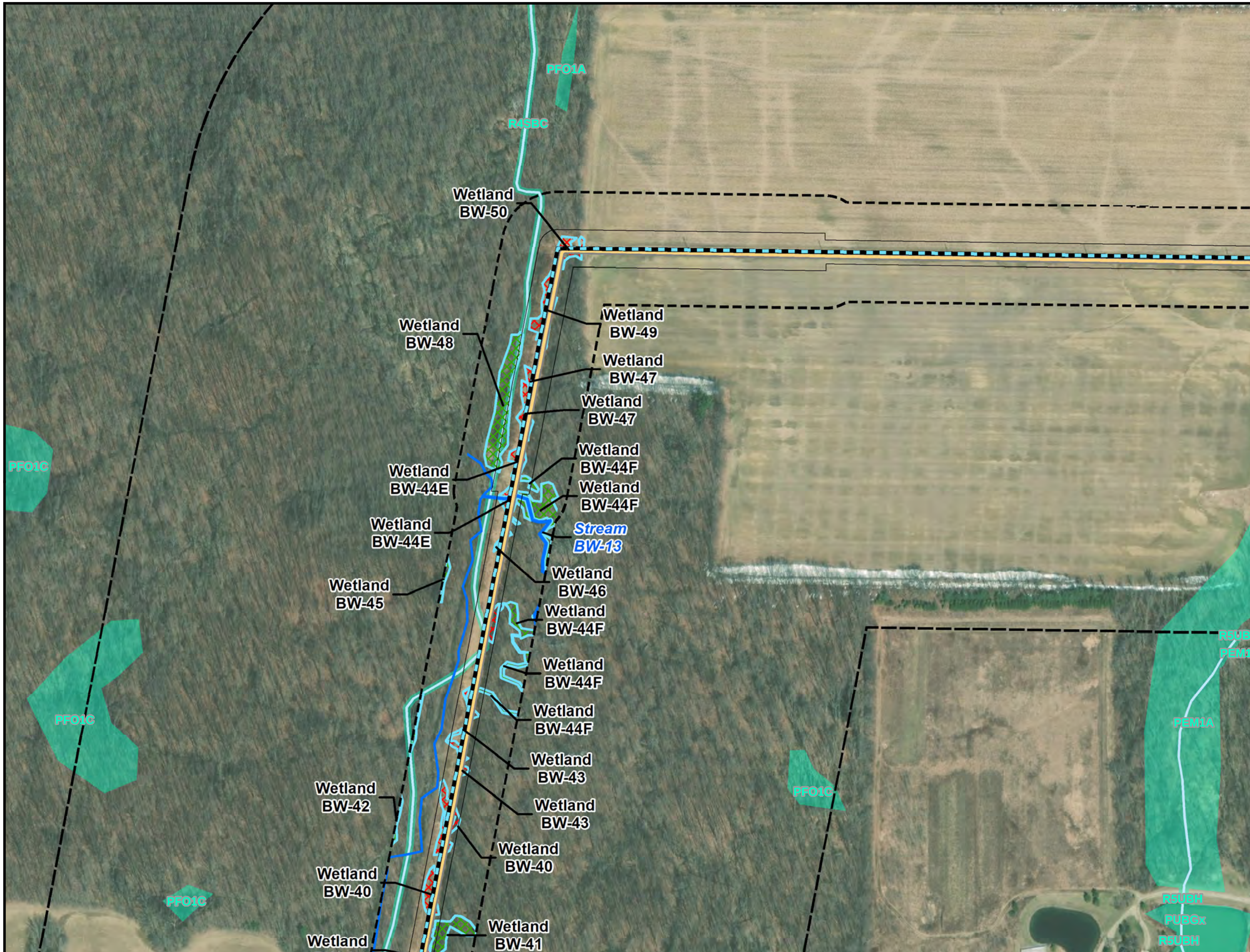
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 H
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 I
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

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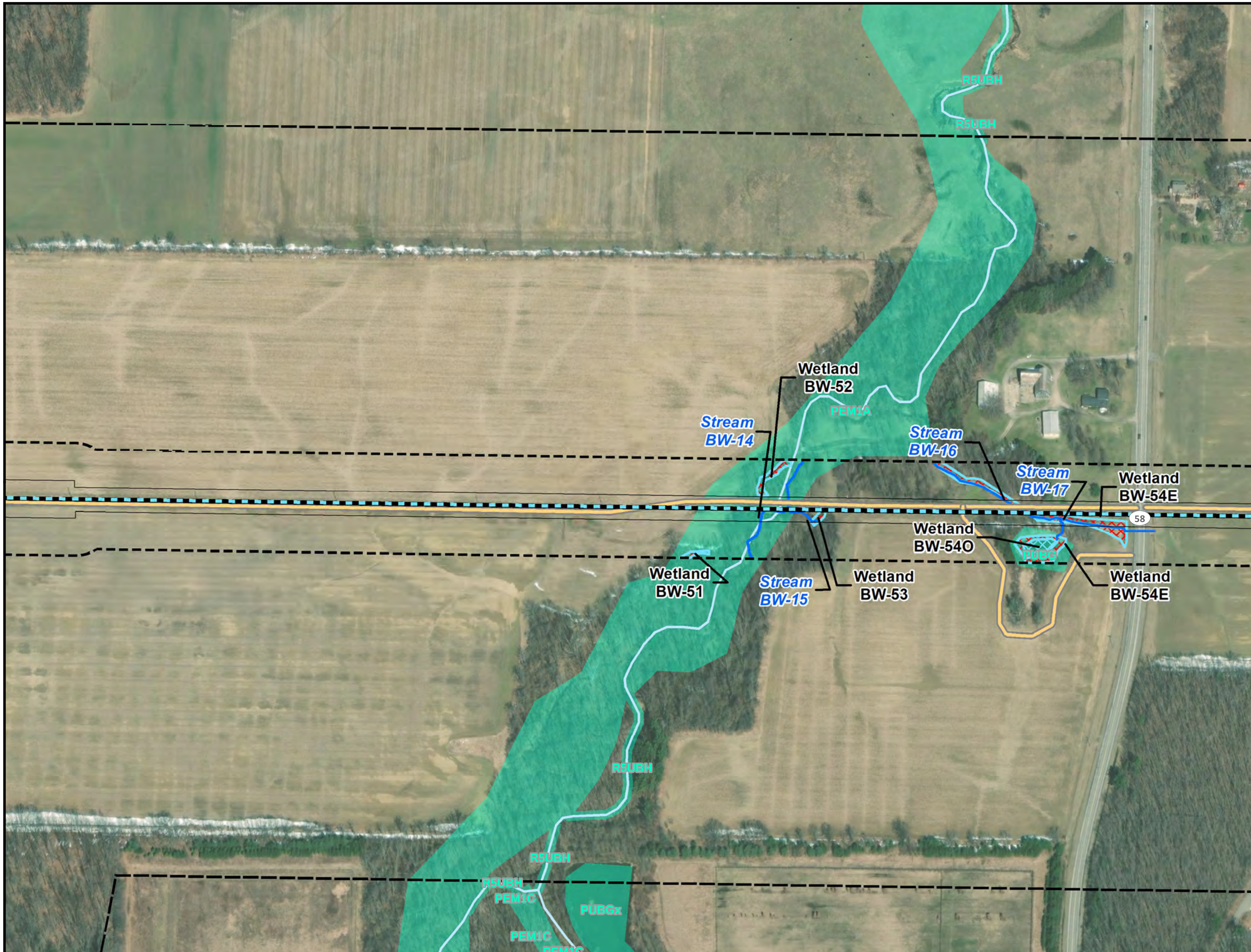

LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

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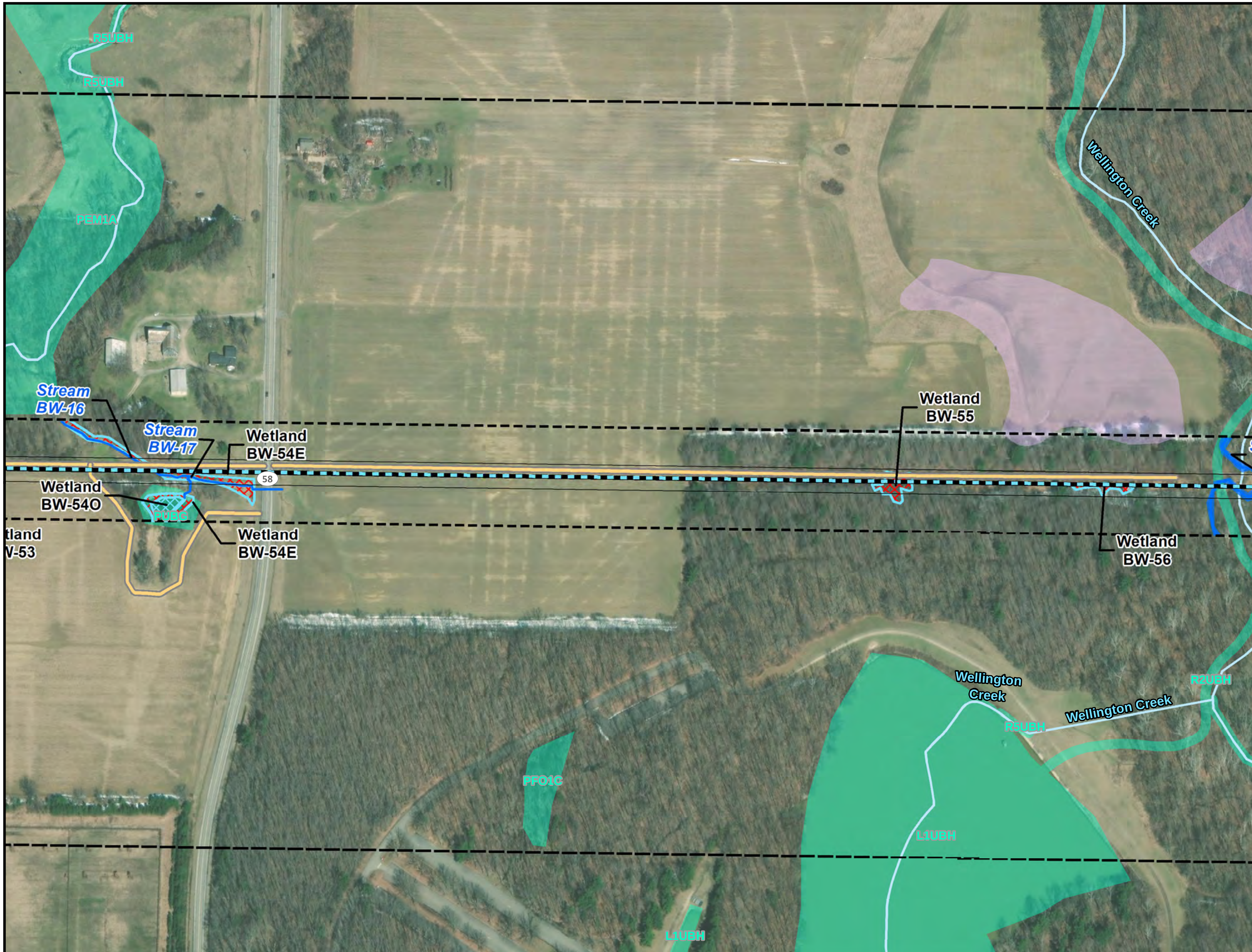
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 J
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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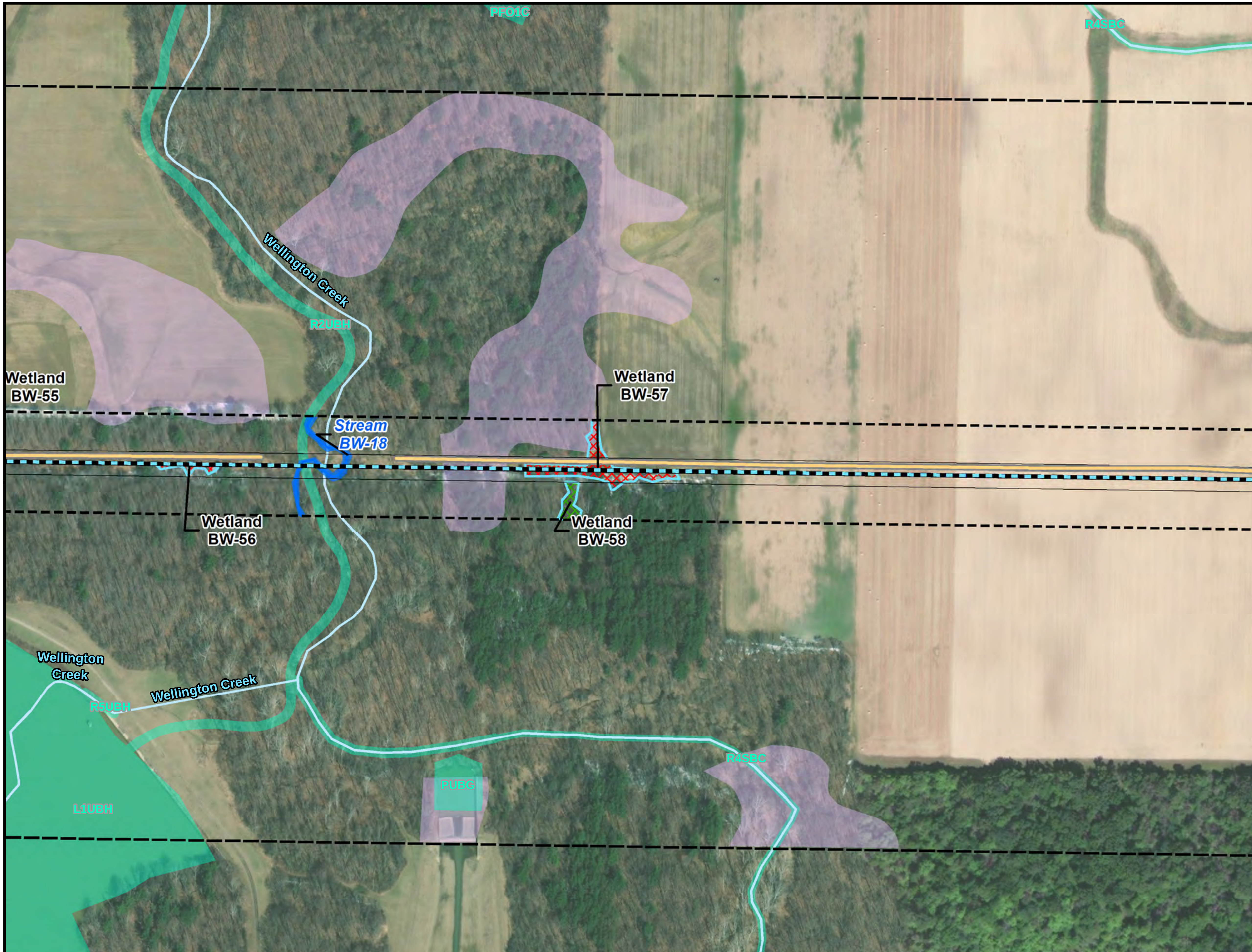
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 K
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 L
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

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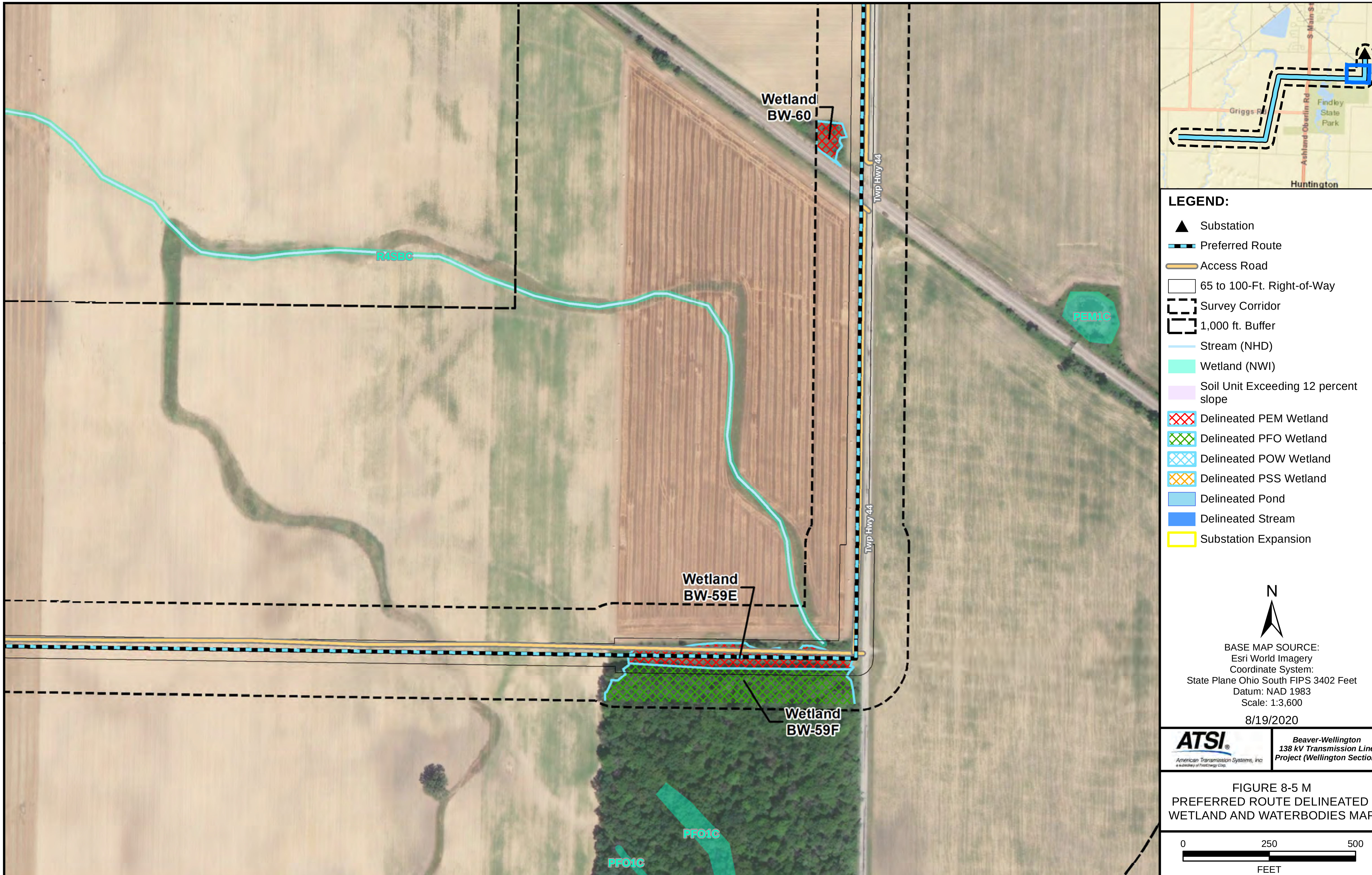
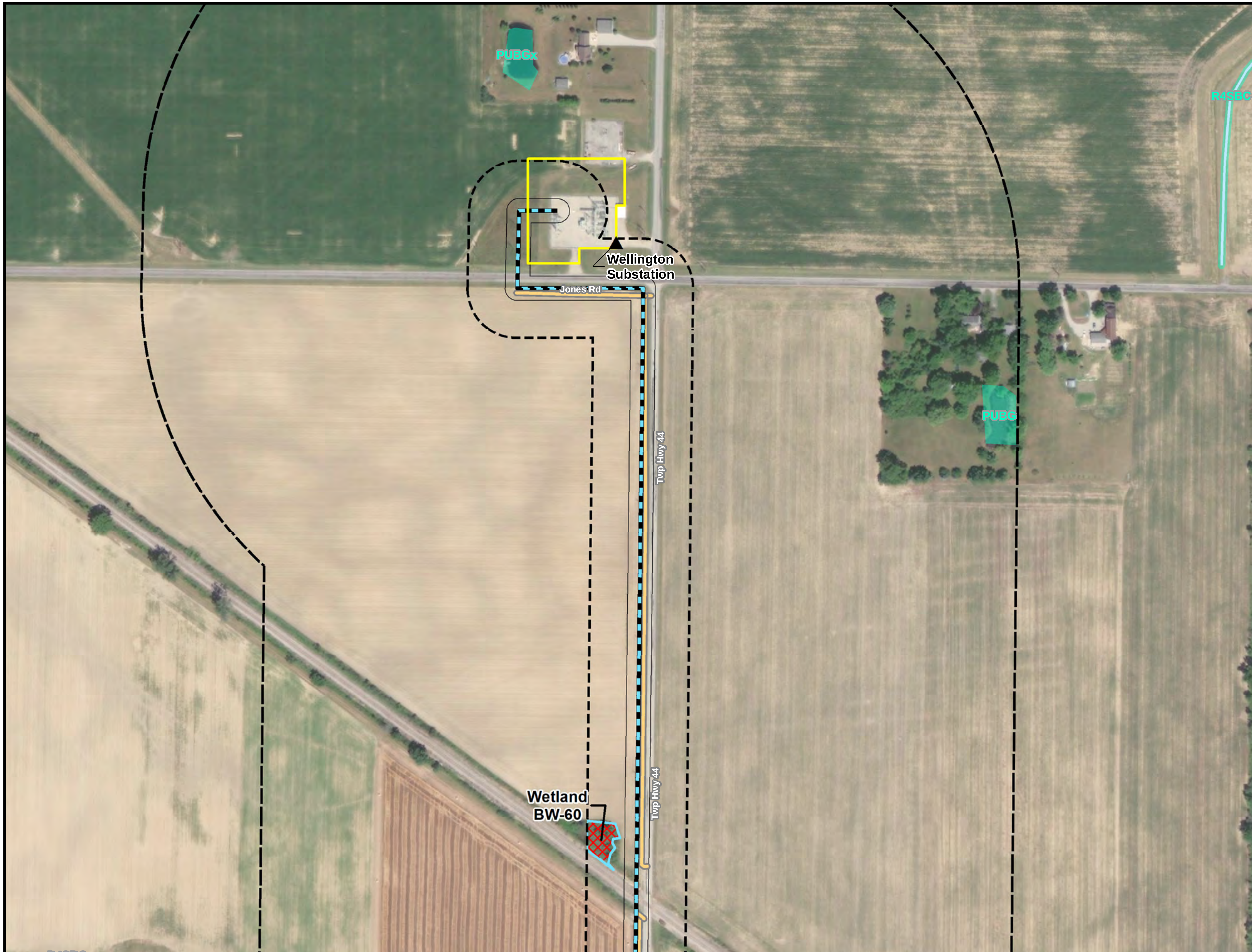


Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 M
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP



LEGEND:

- Substation
- Preferred Route
- Access Road
- 65 to 100-Ft. Right-of-Way
- Survey Corridor
- 1,000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent slope
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated POW Wetland
- Delineated PSS Wetland
- Delineated Pond
- Delineated Stream
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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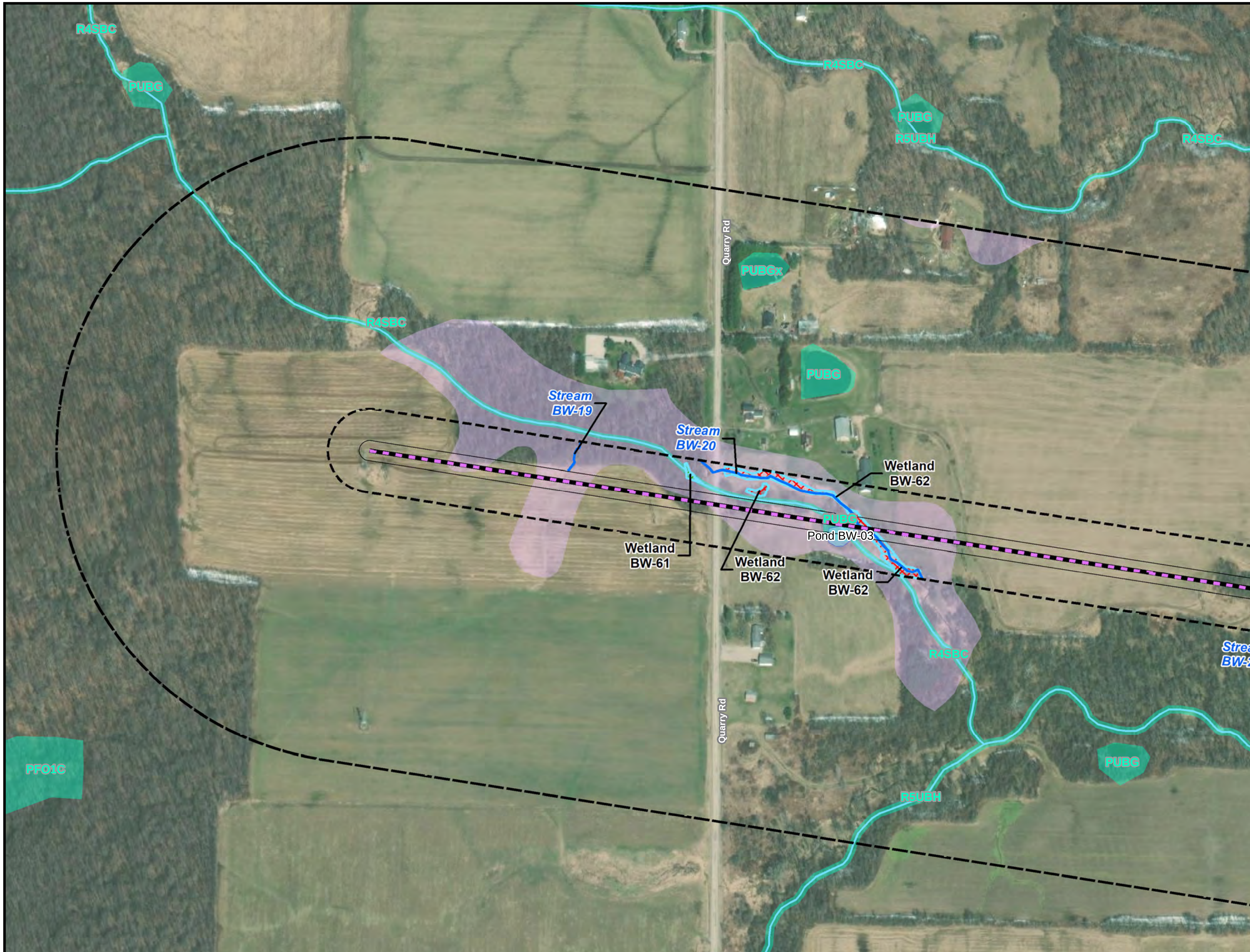
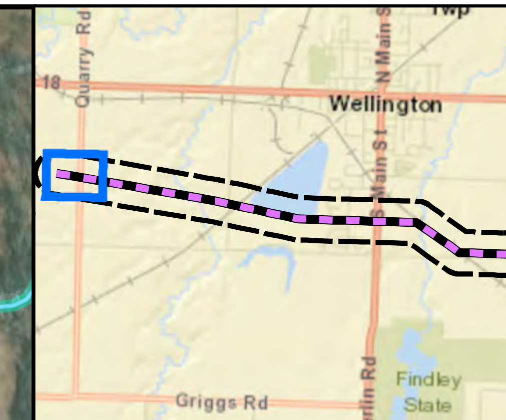
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-5 N
PREFERRED ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

\\dc1vs01\GISProj\F\FirstEnergy\Beaver_Wellington_138KV\Maps\Report\OPSB\Wellington_Figures_8-5_PreferredOPSB.mxd





LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent Slope
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 A
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET

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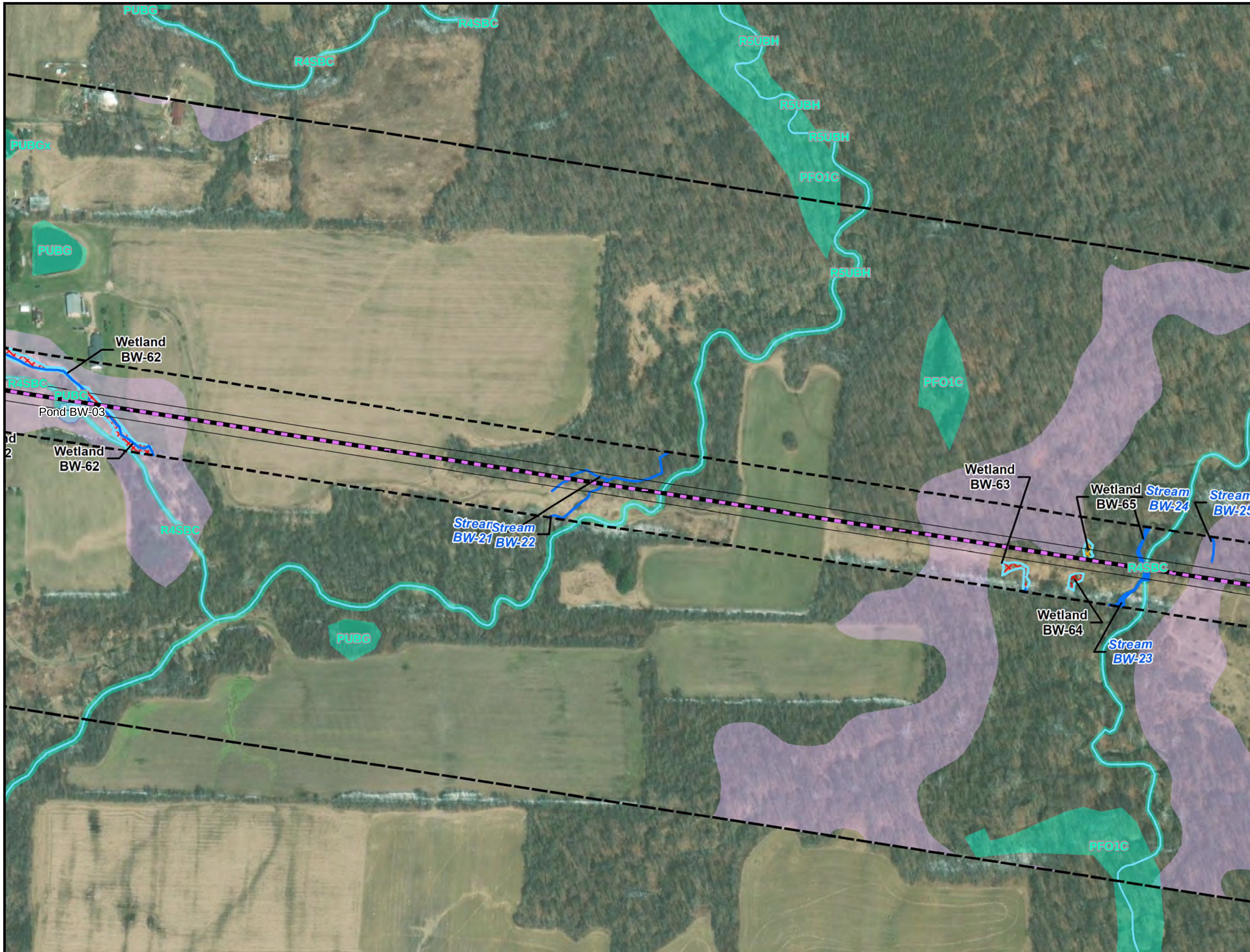

LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent Slope
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

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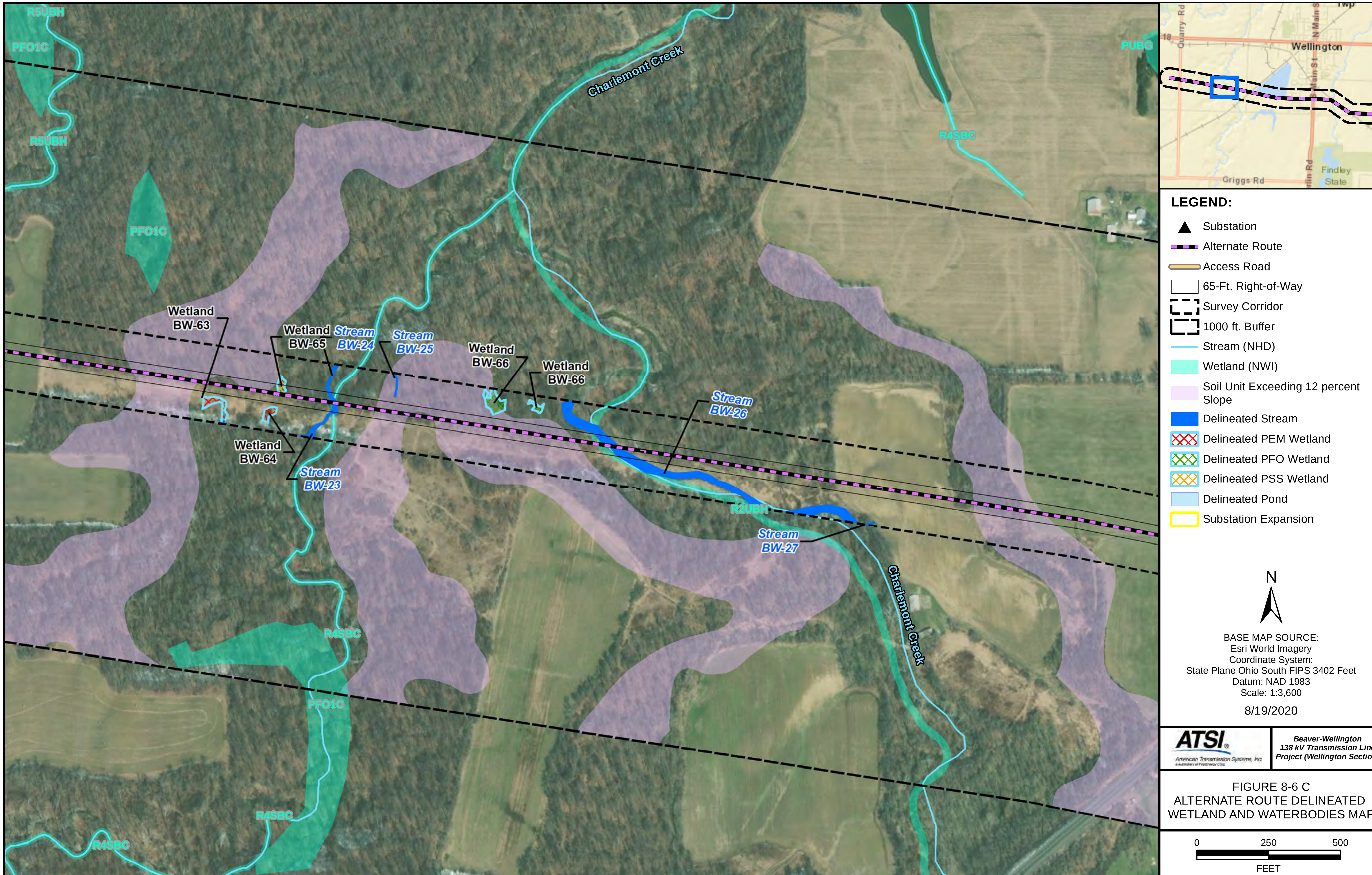
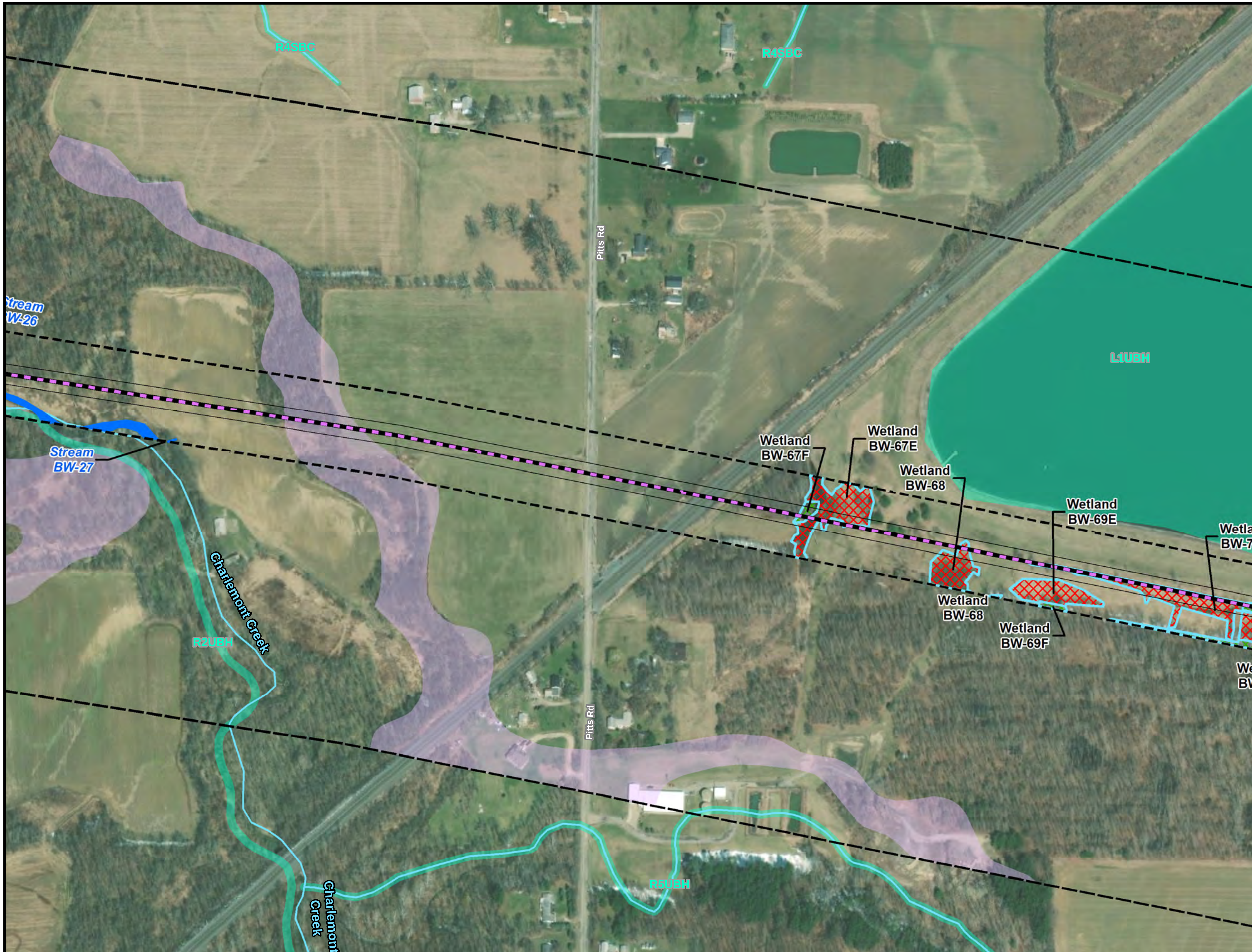
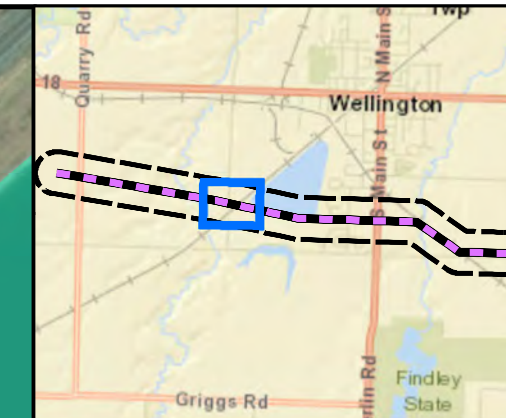
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 B
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET


R5UBH
PFO1C
R5UBH
PFO1C
Charlemont Creek
PUBG
R4SBC
Wellington
Quarry Rd
Griggs Rd
Findley State
Wetland BW-63
Wetland BW-65
Stream BW-24
Stream BW-25
Wetland BW-66
Wetland BW-66
Stream BW-26
Wetland BW-64
Stream BW-23
R2UBH
Stream BW-27
Charlemont Creek
R4SBC
PFO1C
R4SBC
R4SBC
LEGEND:
Substation
Alternate Route
Access Road
65-Ft. Right-of-Way
Survey Corridor
1000 ft. Buffer
Stream (NHD)
Wetland (NWI)
Soil Unit Exceeding 12 percent Slope
Delineated Stream
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland
Delineated Pond
Substation Expansion
N
BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600
8/19/2020
ATSI
American Transmission Systems, Inc
Beaver-Wellington
138 kV Transmission Line
Project (Wellington Section)
FIGURE 8-6 C
ALTERNATE ROUTE DELINEATED
WETLAND AND WATERBODIES MAP
0
250
500
FEET





LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent Slope
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

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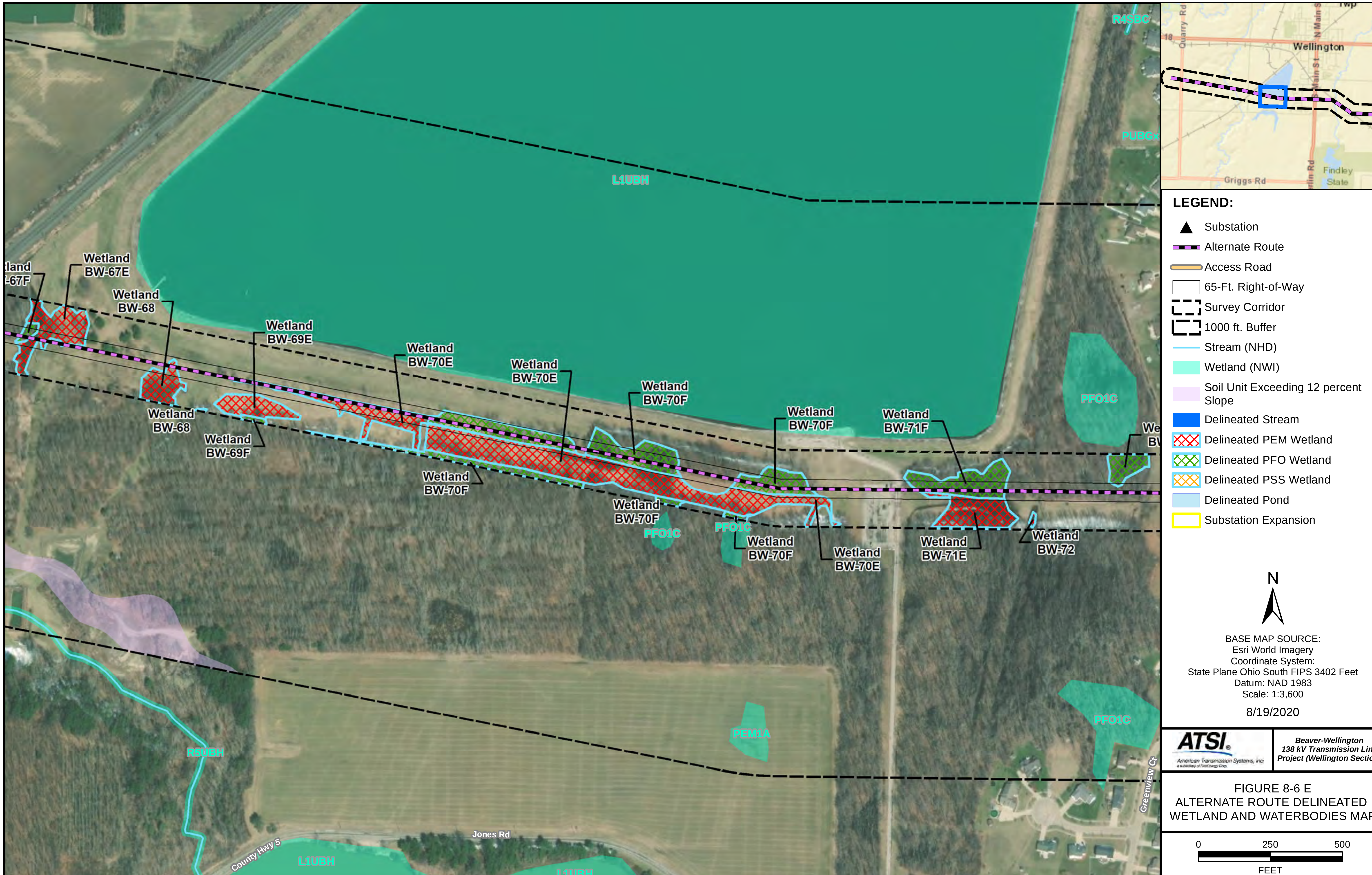
American Transmission Systems, Inc

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 D
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

0 250 500
FEET



LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
- Soil Unit Exceeding 12 percent Slope
- Delineated Stream
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

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

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 E
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

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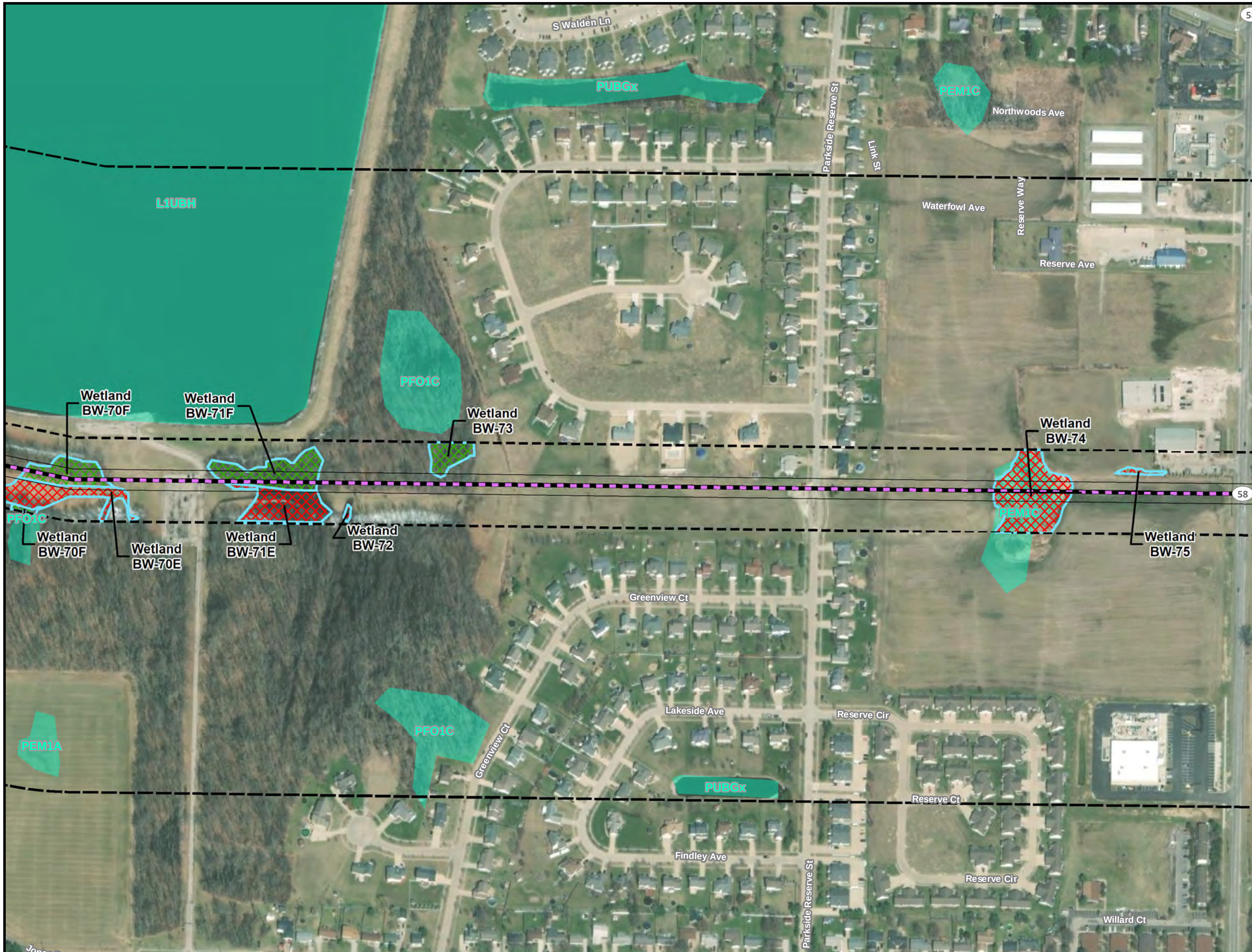

LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
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- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

ATSI
American Transmission Systems, Inc
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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 F
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

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FEET

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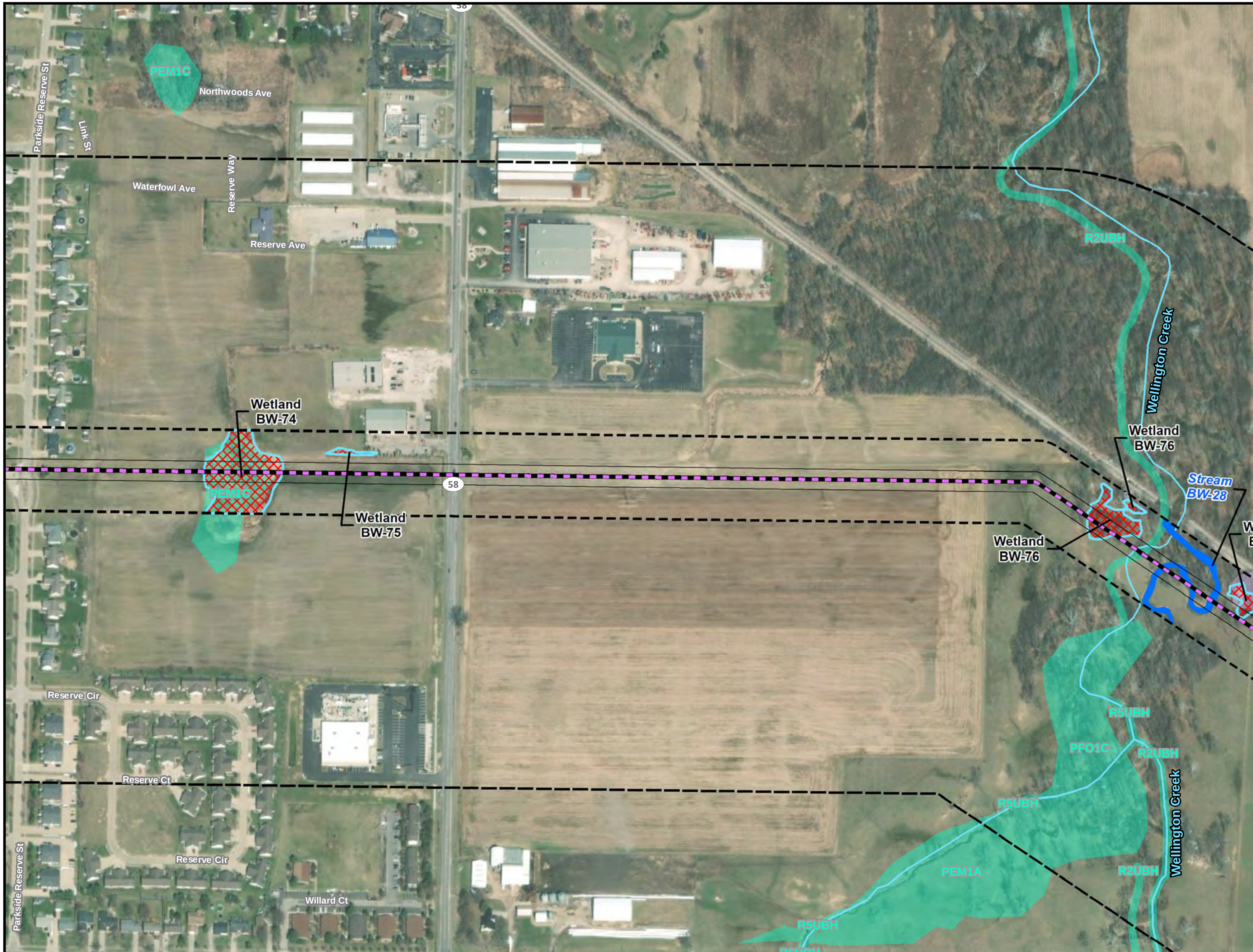

LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
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- Delineated PSS Wetland
- Delineated Pond
- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

ATSI
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Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 G
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

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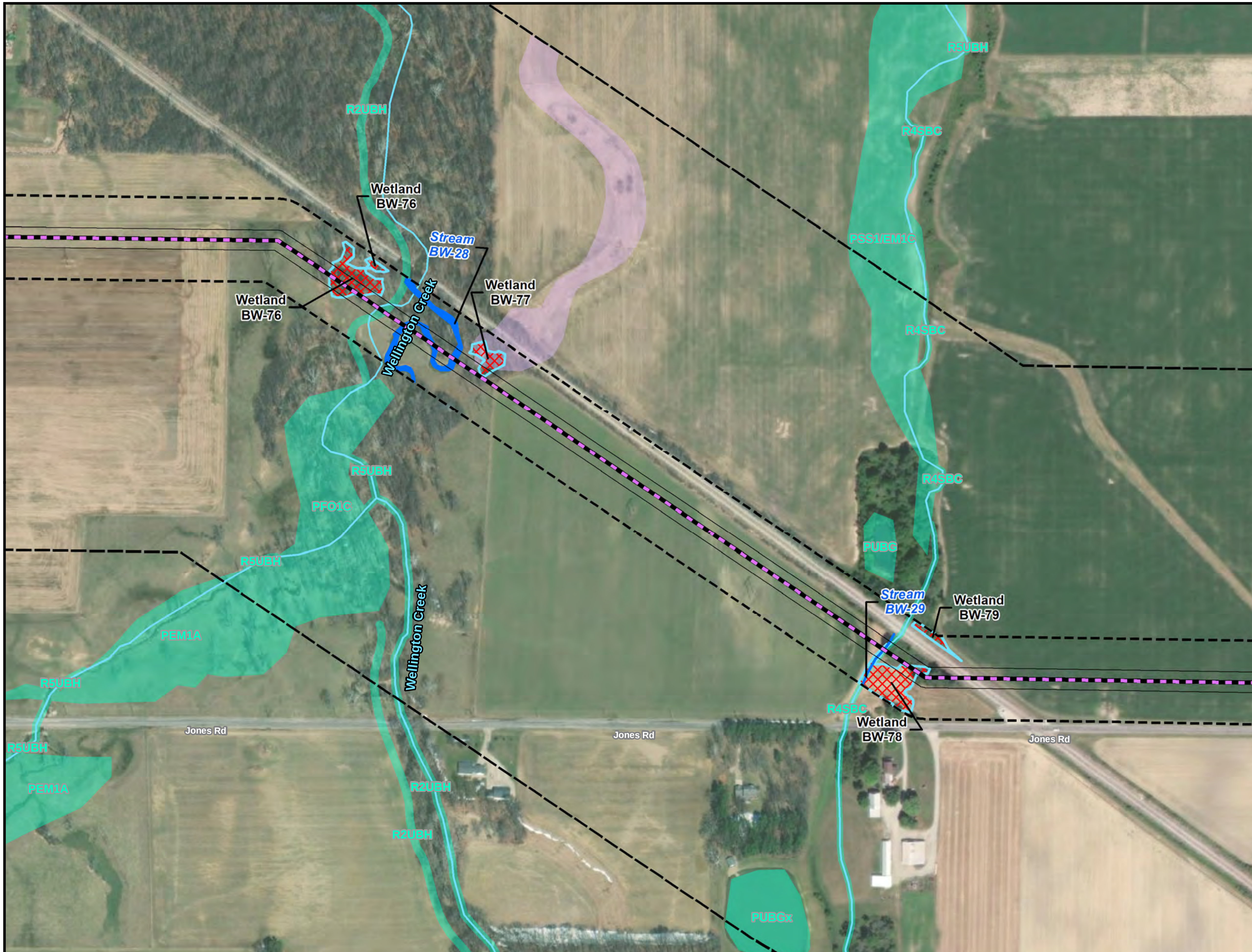

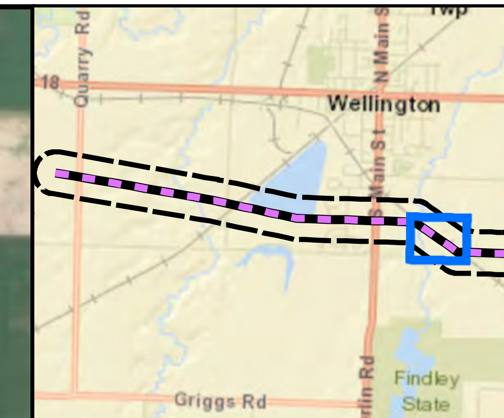

LEGEND:

- Substation
- Alternate Route
- Access Road
- 65-Ft. Right-of-Way
- Survey Corridor
- 1000 ft. Buffer
- Stream (NHD)
- Wetland (NWI)
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- Delineated PSS Wetland
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- Substation Expansion

N

BASE MAP SOURCE:
Esri World Imagery
Coordinate System:
State Plane Ohio South FIPS 3402 Feet
Datum: NAD 1983
Scale: 1:3,600

8/19/2020

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

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

FIGURE 8-6 H
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

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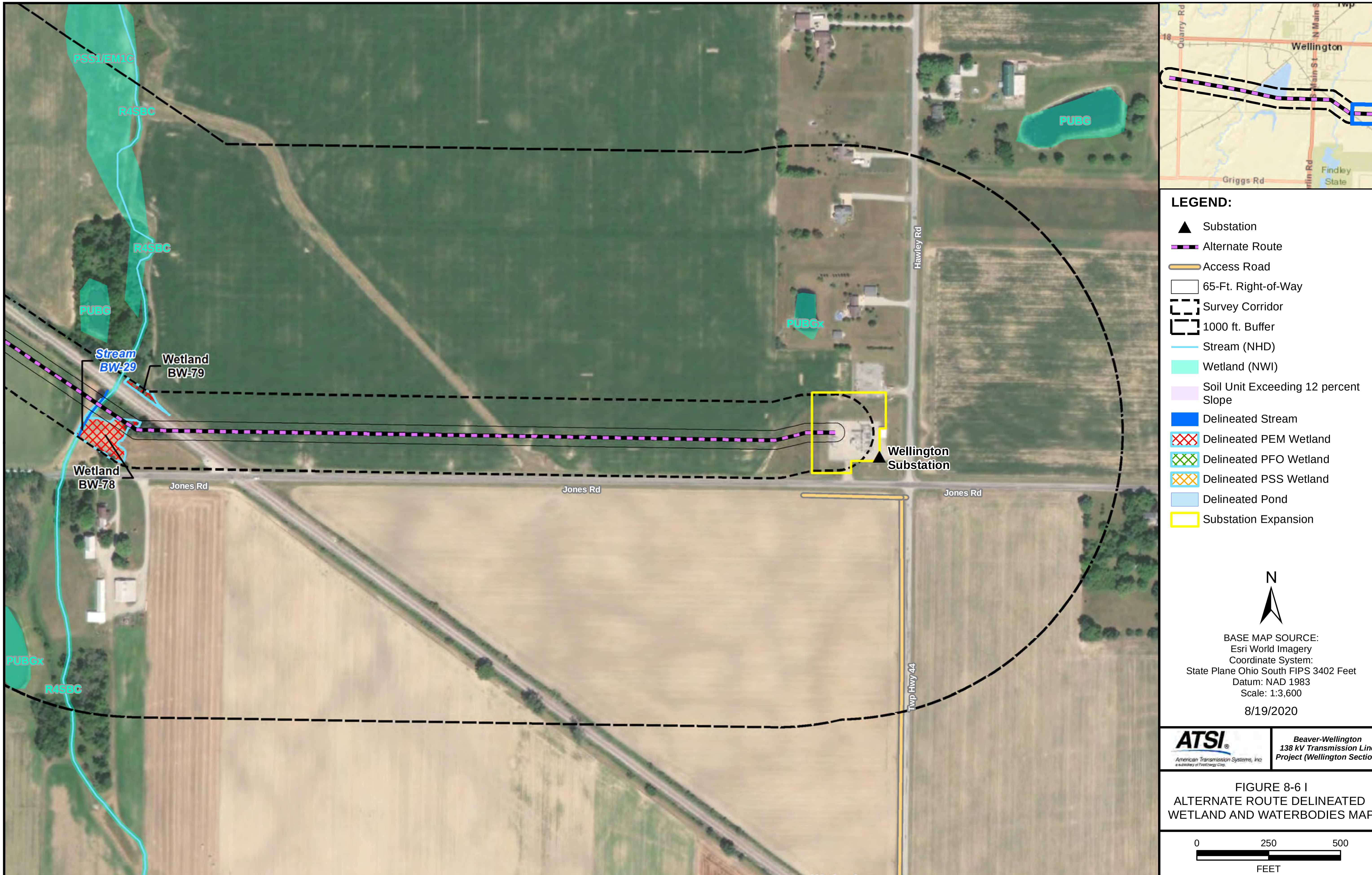

FIGURE 8-6 I
ALTERNATE ROUTE DELINEATED WETLAND AND WATERBODIES MAP

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Appendix 4-1
Route Selection Study

Beaver-Wellington 138 kV Transmission Line Project

Route Selection Study (Brownhelm Section)

August 21, 2020

American Transmission Systems, Incorporated

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Acronyms and Abbreviations

ATSI	American Transmission Systems, Incorporated
CECPN	Certificate of Environmental Compatibility and Public Need
FE	FirstEnergy
FEMA	Federal Emergency Management Agency
GIS	geographic information system
I-	Interstate
IPaC	Information for Planning and Conservation
Jacobs	Jacobs Engineering Group Inc.
kV	kilovolt
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
OAI	Ohio Archaeological Inventory
ODNR	Ohio Department of Natural Resources
OGS	Ohio Genealogical Society
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
Project	Brownhelm Section of the overall project
SR-2	Ohio State Route 2
USCB	U.S. Census Bureau
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1. Introduction and Project Overview

1.1 Nature and Purpose of the Project

American Transmission Systems, Incorporated (ATSI), a FirstEnergy (FE) company, is proposing to develop a new 138 kilovolt (kV) transmission line between the existing Beaver Substation located in the City of Lorain, Lorain County, Ohio, and the existing Wellington Substation, located in Wellington Township, Lorain County, Ohio (Figure 1). The proposed project will be known as the Beaver-Wellington 138 kV Transmission Line and will provide a second 138 kV source to the Wellington Substation. The second transmission source is needed to enhance the reliability, resiliency, efficiency, and operational flexibility of the transmission system in the Wellington, Carlisle, and Seville areas. The project requires an Application for a Certificate of Environmental Compatibility and Public Need (CECPN) be submitted to the Ohio Power Siting Board (OPSB). As part of the CECPN process, a route selection study that analyzes the siting constraints and siting opportunities used to select a Preferred Route and an Alternate Route for the project is required.[1] In accordance with Ohio statutory requirements, this report summarizes the siting process and methodology, and makes a recommendation on a Preferred Route and an Alternate Route for the Brownhelm Section of the Project (Project).

Construction of the project consists of three components. These components are:

1. Converting the existing Wellington Substation into a four-breaker ring bus configuration and install a second 138/69 kV transformer. This will require an approximately one-acre expansion to the existing substation.
2. Constructing an approximately one-mile long section (known as the Brownhelm Section) and an approximately six-mile long section (known as the Wellington Section) of new 138 kV transmission line.[2]
3. Reconfiguring (un-six-wire) the existing Brookside-Henrietta 138 kV Transmission Line and Beaver-Henrietta 138 kV Transmission Line to create the new Beaver-Wellington 138 kV Transmission Line.

1.2 Project Area Description

The Project area is located in northern Lorain County, which makes up the western edge of the Cleveland Metropolitan Area. According to the U.S. Census Bureau (USCB) 2018 official population estimates, Lorain County had approximately 390,461 people with the primary settlement areas in the northern area of county in the cities of Elyria, Amherst, North Ridgeville, Lorain, Avon, and Avon Lake. The northern area of the county is primarily urban and suburban, in contrast, the southern area of the county has a more rural setting, with fewer high-density developments. The primary transportation corridors through the northern portion of the county are Interstate 90 (I-90), the Ohio Turnpike (I-80), U.S. Route 20, and Ohio State Route 2 (SR-2).

According to data from the USCB, Lorain County has sustained approximately 5 percent growth between the 2000 census and the 2018 population estimate, with population growing by 16,692 people between the 2000 and 2010 census (284,664 to 301,356) and 8,105 people between the 2010 census and the 2018 census estimate (301,356 to 309,461). Population growth in the Cleveland suburbs near the Project are in the cities of Avon (2010 population: 21,193, 2018 estimate: 23,273) and Avon Lake (2010 population: 22,581, 2018 estimate: 24,391) are experiencing the highest rate of growth in Lorain County at 9.8 percent and 8.0 percent respectively.

ATSI is proposing to build the Project in the eastern part of Brownhelm Township to serve existing and future growth in the area and to sustain service reliability. Existing land uses surrounding the Project area consist primarily of low-density suburban single family residential. There is also a large concentration of ATSI transmission lines that run through the area. The Project area is in the general vicinity of the intersection of Rice Road and Heritage

[1] OAC §§ 4906-5-04

[2] A separate route selection study was prepared for the Wellington Section that addresses the routing analysis and recommendations for the approximately 6-mile transmission line.

Way. Along Heritage way is a low-density suburban development with single-family homes on large (1 acre and larger) lots. Land uses gradually become more rural to the south and west of the area with a sustained development pattern of low-density single-family housing on large parcels. North and west of the area, the development pattern is suburban with higher density residential and commercial development closer to Lorain, Elyria, Amherst, and Avon.

Physical attributes in the Project area include a terrain that is relatively flat, gradually sloping down towards Lake Erie with elevation ranging from 650 and 800 feet above sea level. There are active agricultural fields interspersed with housing developments, and woodlands are located sporadically throughout the Project area as well as a few streams. No major environmental features are in the Project area beyond would what be expected in this landscape.

2. Siting Study Process

2.1 Siting Process Overview

In compliance with the OPSB requirements, the Project siting team, which consists of a multi-disciplinary siting staff from ATSI, Burns & McDonnell, Inc, and Jacobs (as described in Appendix A), used a common siting methodology that is routinely utilized to site transmission projects in Ohio and other states. Although core siting processes and goals remain the same across all projects, there are unique elements to each project related to geography and setting, the type of project, the political and regulatory climate, and the project schedule. These unique elements influence the siting criteria and their relative weighting (or emphasis).

Transmission line projects can encounter a suite of competing technical, environmental, and land use criteria requiring a comprehensive, relevant, and effective siting study design. That design should use appropriate data at the appropriate scale to focus quickly on those areas and corridors with the greatest potential for success. The siting process and methodology must also be transparent and effectively communicated.

The siting process provides a layered process employing appropriate methods for the siting team to determine the Preferred and Alternate Routes for the Project. The process used for this Project consisted of the following primary task:

1. **Identifying a Project-specific study area:** The first step in the siting process was to develop a Project-specific study area that identifies an appropriate geographic boundary where the siting team can collect detailed constraint and opportunity data. The study area should include a large enough area to investigate reasonable routing alternatives for the Project. As part of the identification of a study area, the siting team reviewed publicly available environmental, land use, and socioeconomic information and determined the boundaries of the study area based on the initial opportunity (e.g., locations where a new transmission line may have least impacts) review and constraint (e.g., existing land or man-made features that are less suitable for a transmission line siting) review.

2. **Mapping of constraint and opportunity data:** After the siting team developed the study area, further constraint and opportunity data was collected under three broad headings; ecological, land use/cultural, and technical. Data was collected under these broad headings based on their relevance to the Project, the study area, and the availability and quality of the dataset. Once collected, the data was analyzed by way of the following:

    a. The data was mapped within the study area to produce an overall constraint and opportunity map. This initial mapping gave the siting team insight into all the constraints located within the study area generally.

    b. After the data mapping was complete, the opportunity and constraint information was converted into raster-based (or grid cell) layers and assigned a suitability value related to its suitability to host a transmission line. For example, an existing utility right-of-way would be assigned a high suitability score, while a residential area or wooded wetland would be assigned a low score. These individual suitability layers were combined to form an overall suitability surface, which assists the siting team with developing a study segment network.

3. **Develop a study segment network and identification of alternative routes:** Once the suitability mapping and raster-based layers were completed, the information gleaned from the data analysis was used to develop a study segment network. Study segments were developed by using corridors that were the most conducive to electric transmission line development. Once the study segments were developed, each segment was scored based on the suitability model created under task 2 and reviewed to determine whether any segments should be removed based on more suitable segments.

The siting team then developed unique alternative routes for the Project by combining study segments. Before moving on to the next step in the siting process, all of the alternative routes were reviewed, and minor adjustments made to confirm all of the alternative routes proposed were feasible from a construction, environmental, and operational standpoint.

4. **Comparing alternative routes:** Once the alternative routes were identified, and routing adjustments were incorporated, the siting team established a further set of metrics to compare and rank the alternative routes. These advanced metrics were based on opportunities and constraints identified within the study area and weighted based on the specific Project area setting and primary land uses, as well as the professional judgement of the siting team's experience routing projects in a similar setting.

   Based on quantitative scores and qualitative factors, the siting team identified two route alternatives to present at the public information meeting. As part of this process, the siting team chose routes that met the OPSB requirement that alternative routes submitted as part of the CECPN application have no more than 20 percent in common.[3]

5. **Public information meeting:** The Project team held a public information meeting in the area in which the Project is located to present the Project, the two alternative routes and solicit written comments from the public to incorporate in the siting process. The initial public information meeting was supplemented in July and August of 2020 with an additional public engagement process.

6. **Route adjustments and re-evaluation**: The Project team made route adjustments based on applicable and relevant feedback from property owners at the initial public information meeting, the supplemental public engagement process, as well as detailed engineering and re-evaluated the two alternative routes. Because of the nature of the data collection and analysis process used in the review of siting options, the siting team was (and remains) able to reevaluate routes, corridors, and data with minimal additional processing of data inputs.

7. **Selection of a Preferred and Alternate route:** In addition to the quantitative evaluation, qualitative factors also play a crucial role in the selection of a Preferred Route and Alternate Route for the CEPCN application. The qualitative factors vary from project to project and could include visual impacts, local public perception and preferences, current land use, and proposed future land use. The siting team used their respective experiences to determine what, and how much qualitative data influenced routing decisions. Further record of qualitative information gleaned through the project is discussed in other sections of this document. Once the qualitative and quantitative analysis was considered, the siting team selected the Preferred and Alternate Routes presented in the Application.

2.2 Siting Study Timeline

The following provides a brief summation of the steps that the siting team followed through the route selection process:

- Field Review – October 9, 2019
- Study Segment Network Developed– November 4, 2019
- Identification of Alternative Routes – November 15, 2019
- Evaluation of Alternative Routes – November 27, 2019
- Siting Team Meeting: Decision on Alternative Routes – December 2, 2019
- Public Information Meeting – January 7, 2020
- Alternative Route Adjustments – Spring 2020
- Decision on Preferred and Alternate Routes for OPSB Application – June 2020

[3] OAC § 4906-3-05

3. Detailed Siting Study Steps

3.1 Identifying a Project Specific Study Area

The study area's boundaries were determined by the geographic area encompassing the intersection of Rice Road and Heritage Way and includes where ATSI is intending to build the one-mile long Brownhelm Section. The study area was defined to include a reasonable area where potential routes could be identified. Given these considerations, the siting team identified a study area encompassing approximately 2,138 acres (3.34 square miles) in Lorain County as shown on Figure 2.

The northern boundary of the study area extends approximately 1.72 miles along SR-2 and an existing railroad, to a point in between North Quarry Road and West Martin Avenue. The eastern boundary extends south for approximately 1.77 miles generally along Quarry Road and avoids densely developed neighborhoods to the east. The eastern boundary crosses Middle Ridge Road and meets the southern boundary at the Ohio Turnpike. The southern boundary travels approximately 1.72 miles west along the Ohio Turnpike to Baumhart Road where the southern boundary meets the western boundary. The western boundary continues north for approximately 2.76 miles along Baumhart Road to where it meets the northern boundary.

The siting team believed that extending the study area past these boundaries would add unnecessary area without significant benefit. North of the northern boundary of the study area would be beyond the area ATSI identified as needing the one-mile long Brownhelm Section. East of the study area boundary there are higher density residential developments that would have provided significant constraints to routing a new transmission line. Extending the study area south or west of the identified boundaries would have added unnecessary length to the Project.

3.2 Mapping of Constraint and Opportunity Data

Once the study area was determined, Jacobs reviewed publicly available data specific to the study area to identify opportunities and constraints that could affect the viability of a proposed transmission line route. Typical constraints evaluated included the following:

- **Environmental constraints:** wetlands, waterbodies, floodplains, and records of the presence of threatened and endangered species.
- **Cultural resources constraints:** resources listed on the National Register of Historic Places and historic districts, state-listed historical resources, architectural resources, and known archaeology sites.
- **Land use constraints:** existing residential, commercial and industrial uses, federal, state, or local lands, railroads, interstate highways, potential right-of-way encroachments, and potential for future land uses.

The sections below summarize the information identified within the study area. Appendix B presents a list of the geographic information system (GIS) data sources used for this study. GIS data sources vary with respect to accuracy and precision. For this reason, GIS-based calculations and maps presented throughout this study should be considered reasonable approximations of the resource or geographic feature they represent and should not be considered absolute measurements or counts.

3.2.1 Constraints and Opportunity Data

Environmental Resources

Environmental resource data was reviewed before the siting of electric transmission lines so that environmental constraints could be identified, and routing corridors could be developed to avoid and/or minimize potential impacts on environmental resources. Environmental data and information collected within the study area was used to examine different aspects of the project in ways that were environmentally and economically prudent.

Environmental resources can present constraints to routing electric transmission lines. Large water features, such as lakes, wetlands, or floodplains, can present routing constraints that limit the siting team's ability to develop study segments and routing alternatives in certain areas. The siting team used the environmental data to develop study segments and routing alternatives that avoid these features to the extent practicable. The following environmental resources were reviewed within the study area as resources that could present routing constraints.

Wetlands

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) was reviewed to identify the abundance, characteristics, and distribution of wetlands within the study area. Based on the data, there are four forested and shrub wetlands within the study area totaling 4.28 acres. Sixteen ponds totaling 12.98 acres are also within the study area. Figure 3 shows NWI wetland and pond locations within the study area. No wetlands of state/national significance are located within the study area.

Wetland crossings are commonplace for overhead electric transmission facilities and may occur within a route corridor. Wetland permitting would be required before installing temporary access roads, temporary work pads, and/or temporary pulling pads. ATSI would look to avoid placing permanent structures within wetlands where possible. Based on the location and size of wetlands within the study area, wetlands were considered a minor constraint to siting a transmission line in the study area.

Waterbodies

U.S. Geological Survey (USGS) topographical maps and National Hydrography Dataset (NHD) were reviewed to identify major perennial and intermittent streams within the study area that could potentially impact feasibility of a transmission line because of required span length (distance between two transmission structures) needed to cross the waterbody or waterbody crossings require additional permitting/coordination with federal and state agencies. Two named streams and their associated unnamed tributaries run through the study area. Brownhelm Creek runs east/west in the western part of the study area and Quarry Creek runs north/south across the entire study area, as shown on Figure 3.

Like wetlands, stream crossings are commonplace for overhead electric transmission facilities and may occur within a route corridor. Based on the location of the streams within the study area, a stream crossing would likely occur within a route corridor, though the span length would not impact feasibility of the transmission line; therefore, streams were considered a minor constraint to siting a transmission line within the study area.

Floodplains

Federal Emergency Management Agency (FEMA) floodplain maps were reviewed to identify floodplains within the study area. Based on the information gathered from FEMA, floodplains occur along Brownhelm Creek in the west side of the study area, Quarry Creek in the southern half of the study area, and along an unnamed tributary to Quarry Creek in the northwest corner of the study area (Figure 3). These floodplains are relatively small in size with a maximum width of 350 feet.

The floodplains within the study area are associated with the listed streams; therefore, a floodplain crossing would likely occur within a route corridor. FEMA floodplain permitting would be required before installing temporary access roads, temporary work pads, and/or temporary pulling pads and ATSI would look to avoid placing permanent structures within the floodplain where possible. Based on the width of the floodplains and ATSI's ability to avoid work within the floodplain, they were not considered a constraint to the Project.

Threatened and Endangered Species

USFWS Information for Planning and Conservation (IPaC) and Ohio Department of Natural Resources (ODNR) State Listed Wildlife Species was reviewed to determine federally and state-listed endangered, threatened, rare, special concern, and species of concern that have the potential to occur within the study area. Based on these reports, the Indiana bat, northern long-eared bat, sandhill crane, northern harrier, and upland sandpiper have potential to occur within the study area (Appendix C). No areas of high-quality habitat were identified within the study area.

At this stage in the Project, the available data on threatened and endangered species does not limit the opportunities for siting potential routes within the study area and therefore were not considered a constraint on the Project. Jacobs understands that project activities will likely be planned such that potentially suitable habitat areas will be avoided entirely or staged such that effects to federally and state-listed species are unlikely or completely avoided.

Cultural Resources

Cultural resources data was reviewed to identify and examine the locations and types of previously recorded cultural resources within the study area. Cultural resources can present a major constraint for transmission line routing where there are resources of exceptional significance, groupings of resources, or large districts that may deter transmission line corridors from crossing specific sections of a study area. Analyzing and mapping cultural resources enables the siting team to develop study segments and routing alternatives that avoid, minimize, or mitigate impacts to known cultural resources within the study area.

Jacobs conducted background research using the Ohio Historic Preservation Office (OHPO) online mapping database in September 2019, to locate previously recorded cultural resources and surveys within the study area. This investigation revealed two Ohio Archaeological Inventory (OAI)-listed archaeology sites, three Ohio Historic Inventory (OHI)-listed architectural and historical resources, and one Ohio Genealogical Society (OGS)-listed cemetery within the study area. The cemetery and the architectural and historical resources within the study area are shown on Figure 4. Due to the confidential nature of archaeological sites, their locations cannot be disclosed to the public.

Archaeological Sites & Architectural and Historical Resources

Of the two previously inventoried archaeological sites, one is a prehistoric site and one is a historic era isolated find. The prehistoric site (33LN0094) has not been evaluated for National Register of Historic Places (NRHP) eligibility. The historic site (33LN0277) has been recommended as being not eligible for NRHP listing. The OGS-recorded cemetery, the Onstine Cemetery (OGS #6966), has not been evaluated for NRHP eligibility. Three OHI-listed architectural and historical resources are located within the study area: LOR0001226, the Cable House; LOR0001326, the Herbert Gammons House; and LOR0133426, the Solomon Whittlesey House. All three are single dwellings, one of which was historically used as a barn. Of the three resources, only the Cable House (LOR0001226) has been determined individually eligible for listing on the NRHP.

Jacobs' siting team determined these resources to be a minor constraint on the Project. Specific transmission structure design and height, as well as the locations of the routing corridors, determine how much risk these sites would have on a route being approved by a regulatory agency.

National Register of Historic Places

Surveyed cultural resources are evaluated for potential significance according to the NRHP Criteria for Evaluation, which are used as the basis for evaluating significance for state-funded or –permitted projects in Ohio. The presence of NRHP-listed or –eligible cultural resources could be a constraint to a study segment or route alternative, as adverse impacts would require mitigation, in consultation with the OHPO, Native American tribes, and/or other local historical organizations.

There are no NRHP-listed resources within the study area. The Cable House, located at 8279 Baumhart Road, Brownhelm Township, has been determined eligible for NRHP listing. Jacobs' research of the NRHP-listed and NRHP-eligible resources revealed that Cable House is located along the western edge of the study area. At this phase of the routing process, Jacobs determined that this resource poses a low risk to developing electric transmission line corridors because of its location within the study area. It was therefore considered a minor constraint on the Project.

Land Use

Land use impacts include direct and indirect impacts to residential, commercial, recreational, industrial development, and institutional uses (e.g., schools, places of worship, cemeteries, and hospitals) and can limit the potential for a transmission line corridor to be constructed in highly developed areas. As part of this siting study, Jacobs analyzed existing land use features within the study area and whether these existing land uses provide opportunities or constraints to route an electric transmission line within the study area.

The built environment in the study area includes areas of low-density residential areas and a few commercial buildings along the roads. Most of the study area is contiguous open lands (agricultural and forested), which are more conducive to routing transmission lines.

Residential, Commercial, Institutional, and Industrial Development

The primary land use designations in the area are low-density agricultural residential and rural residential. Low-density agricultural residential areas include residences on large agricultural parcels and can be found north of North Ridge Road in the northwest corner of the study area, on the west side of Quarry Road in the central-east part of the study area, and north and south of Middle Ridge Road in the southern part of the study area. Rural residential includes single-family residences on smaller parcels and is found in the northeast corner of the study area along Crosse Road and Tina Lane, in the middle of the study area along Rice Road and Heritage Way, and in the west side of the study area along Baumhart Road.

Commercial land uses are scattered throughout the study area and are comprised primarily of local corner stores/grocery stores. No institutions or industrial development are within the study area. Residential and commercial development in the study area are considered a moderate constraint to the Project.

Recreation Areas

One recreation area was identified within the study area, the Lorain Rifle and Pistol Club. This club includes a 100-yard range and is currently constructing a 300-yard range and 50-yard "U" shaped range. Due to the activities that take place at a rifle and pistol club, this area is considered a major constraint within the study area.

Transportation and Utilities (Major Roads, Railroads, Airports, and Transmission Corridors)

The study area is crossed by county roads and local streets. The primary roadway in the study area is North Ridge Road, which runs northeast to southwest across the northern half of the study area. North Ridge Road connects central Brownhelm Township to the city of Amherst. Another primary road in the study area is Maple Ridge Road which runs east to west along the southern part of the study area. Rice Road runs northwest to southeast, cutting across the middle of the study area. All three county and local roads are fairly developed with residences located on either side. These roads were considered a moderate constraint to routing a transmission line within the study area because most of the residential and commercial uses are located alongside these corridors. The siting team sought to develop study segments that avoided concentrations of land uses along roads in the study area to the extent practicable.

A Norfolk Southern owned railroad runs along the northeast edge of the study area. Railroads can present routing opportunities for transmission line corridors; however, for this Project, the location of the railroad in relation to the rest of the study area did not present routing opportunities. Though the railroad does not present a routing opportunity, it does not present a routing constraint either. This feature is considered neutral to siting a transmission line corridor in the study area.

No airports are located within the study area. The closest airport is Lorain County Regional Airport located approximately 5.4 miles southeast of the study area's southern boundary. This airport is noted in this study; however, it is not located in the study area, and therefore did not present a risk to the routing of potential transmission line corridors within the study area.

Nine 138 kV to 345 kV electric transmission lines owned by ATSI are located within the study area. Most of these lines run north-south through the study area:

- Beaver-Black River 138 kV
- Beaver-Greenfield 138 kV
- Beaver-Henrietta 138 kV
- Beaver-Johnson 138 kV
- Beaver-NASA 138 kV
- Carlisle-Shinrock 138 kV
- Ford Lorain-New Departure 138 kV
- Beaver-Davis Besse 345 kV
- Beaver-Carlisle 345 kV

Existing transmission line corridors, especially those owned and operated by ATSI, were considered an opportunity because they present opportunities for co-locating the proposed 138 kV transmission line within or adjacent to an existing transmission line corridor, potentially minimizing impacts to natural resources and land use.

3.2.2 Field Review

A field review of the site is an important way for the siting team to glean information about the opportunities and constraints identified during the routing development phase of the Project. Members of the siting team conducted a field review on October 9, 2019. Before the site visit, the siting team determined locations within the study area that the team would visit, photograph, and document opportunities and constraints. All of these locations were located within public rights-of-way. Right-of-entry was not requested from property owners due to the preliminary nature of the research.

The following describes what the siting team observed within the Project study area. Figure 5 shows the locations visited by the siting team, Appendix D includes photographs taken at each of the field review locations.

- **Location #1:** The siting team examined the existing 345 kV right-of-way corridor from Rice Road, with photos looking north and south down the corridor. The existing right-of-way is populated by two 345 kV circuits and one 138 kV circuit. Two of the three circuits (a 138 kV and a 345 kV) are located on double-circuit steel lattice structures that run down the western side of the right-of-way. The second 345 kV circuit is located on wooden H-frame structures running down the east side of the right-of-way. East of the right-of-way there is a suburban residential development along Heritage Way comprised of single-family homes on lots that are generally greater than 1 acre. West of the right-of-way there are single-family homes with ingress/egress to Rice Road, and a wooded area. Approximately 1 mile north of the photo location, and directly adjacent to the suburban housing development, several transmission lines of varying voltages converge and cross one another.

South of Rice Road, the transmission line right-of-way passes though agricultural fields and wooded areas. There are also clusters of single-family homes located on the west side of the right-of-way.

- **Location #2:** The second location was located on Rice Road looking north and south down the existing 138 kV transmission line. The existing transmission line right-of-way is populated by double circuit steel lattice structures carrying two 138 kV circuits and is located within an active agricultural field. North of Rice Road, the existing transmission line right-of-way is adjacent to a suburban residential neighborhood (the same neighborhood discussed at photo location #1) with single family homes located on the west side of the right-of-way. The agricultural field that the right-of-way runs through continues to the east and runs up to a wooded area. South of Rice Road there are a row of single-family residences along Rice Road. Beyond the homes, the transmission corridor continues into an agricultural area.

- **Location #3:** The third location the siting team identified was within the suburban neighborhood where Quarry Creek crosses Heritage Way. To the east of Heritage Way, the existing 138 kV lattice structures are visible between the single-family residences. With the exception of some street scaping, the area is cleared and maintained as residential lawn, including up to the banks of Quarry Creek.

  Looking west, the landscape is similar to the east, there are single family residential homes surrounded by residential lawn, including on both sides of the stream, which crosses under Heritage Way using a culvert. Though there is a strip of mature vegetation behind the homes, both of the 345 kV structures are clearly visible from Heritage Way.

3.2.3 Raster-Based Suitability Modeling

Constraint and opportunity data gathered in Section 3.2.1 were scored by the siting team, based on relative importance, then in conjunction with the National Land Cover Data set (2013-2016), used to create a raster-based suitability surface in the form of a grid over the study area. The purpose of this suitability surface was to aid in identifying potential route corridors within the study area. The suitability model analysis resulted in three levels of detail, or tiers of suitability surfaces:

- **Tier 1:** Individual criteria or layers (for example, woodlots, wetlands, soils, and threatened and endangered species were collected and mapped individually). Each data layer was converted to raster format where each grid cell measured 100 feet by 100 feet and was assigned a “suitability” score between 1 and 10, where 1 is “best” and 10 is “worst.” The scores were determined by the Project team using professional experience with similar projects and regulatory guidelines.

- **Tier 2:** Related Tier 1 surfaces were combined into one of three categories (technical, ecological, and land use/cultural) and given a category score. For example, woodlands, wetlands, endangered species and protected areas were combined to form an “ecological” suitability surface. In addition to serving as the foundational pieces of the suitability model, these grouped layers are useful in communicating the siting process to interested parties.

- **Tier 3:** Tier 3 surfaces were generated by combining and applying statistical weights to the three Tier 2 surfaces. The result was an overall suitability surface model which is color-coded using a progressive chromatic scale from red (least suitable) to green (most suitable).

The overall suitability model (Figure 6) includes a color-coded display that allows for an easy visual assessment of routing constraints and opportunities. Additionally, geospatial algorithms can be applied to determine the suitability of potential study segments and corridors.

This model allows for an accurate and reproducible assessment of the data because it employs mathematical principles to arrive at a scientifically-sound conclusion, with minimal impact from human error and bias. The purpose of creating the suitability model for this Project was to clearly identify areas that would be the most suitable for developing a routing corridor network. The suitability model also shows areas where routing constraints would limit the development of routing corridors.

3.3 Develop a Study Segment Network and Identification of Alternative Routes

Developing routes is an iterative process that allows for re-assessment and adjustment of routes to be made throughout the process as a result of the identification of new constraints. As a result of the evolving nature of the route development process, the siting team used specific vocabulary to describe the routes at different stages of route development.

Initial route development efforts start with identification of constraints and opportunities within the study area, as discussed in Section 3.2. Based on the raster-based suitability model developed, the siting team first develops an array of conceptual routes for the Project utilizing areas of the suitability model that highlight areas that are favorable to siting a transmission line and avoiding areas that are less favorable. Where two or more of these conceptual routes intersect, study segments are formed between points of intersection. Together, the assemblage of study segments and their intersecting points are referred to as the Study Segment Network.

As the route development process progresses, the siting team continued to evaluate new data and modify, if necessary, the study segments included in the network to develop a Refined Study Segment Network. Eventually, formal Alternative Routes are developed by assembling the study segments in all possible arrangements that connect the start and end points of the Project.

3.3.1 Developing a Study Segment Network

Using the overall suitability model and review of aerial photography, topographic maps, and the collected attribute and constraint data, Jacobs developed conceptual routes. The intent when developing the conceptual routes was to avoid less suitable areas (i.e., urban areas, wetlands, forested areas) and follow more suitable areas (i.e., existing developed corridors such as roads and existing transmission/distribution lines). Based on the siting process, the Project started with 10 study segments. The initial study segments developed for the Project are described below and shown on Figure 7a-7b.

Study Segment 1 starts in the middle of a field and runs north for approximately 0.45 mile along the west side of ATSI's Beaver -Davis Besse 345 kV Transmission Line and crosses under ATSI's Beaver-Greenfield 138 kV Transmission Line. This study segment parallels existing transmission line infrastructure and is located within ATSI's existing easement.

Study Segment 2 starts in the middle of the field at the same point as Study Segment 1 and runs northwest for approximately 0.27 mile, then north for approximately 0.39 mile, then northeast for approximately 0.30 mile until it connects with ATSI's existing Beaver-Henrietta 138 kV Transmission Line. This study segment takes advantage of open fields and avoids the highly congested area of transmission line structures north and south of North Ridge Road.

Study Segment 3 starts on the east side of ATSI's existing Beaver-Henrietta 138 kV Transmission Line and runs north for approximately 0.21 mile then runs west for approximately 0.21 mile, paralleling the Beaver-Henrietta 138 kV Transmission Line the entire length.

Study Segment 4 starts south of Rice Road and east of existing Structure 995 of ATSI's Beaver Henrietta 138 kV Transmission Line. This study segment runs north and parallel to the existing line for approximately 0.60 mile.

Study Segment 5 splits off south of ATSI's existing Structure 995, running northeast through agricultural fields for approximately 0.12 mile then runs north-northwest for approximately 0.60 mile through an undeveloped residential parcel, across Rice Road and through an agricultural field until it connects with study segments 3 and 4. This study segment uses open residential parcels and agricultural fields to avoid transmission line congestion south of Rice Road along ATSI's existing infrastructure.

Study Segment 6 starts at ATSI's existing Structure 995 and runs north for approximately 0.06 mile. This study segment parallels ATSI's existing Beaver-Henrietta 138 kV Transmission Line.

Study Segment 7 splits off from the north end of segment 6, running west for approximately 0.27-mile, paralleling ATSI's Carlisle-Shinrock 138 kV Transmission Line south of four residential structures and crossing over Quarry Creek. This study segment parallels existing transmission line infrastructure and is located within ATSI's existing right-of-way.

Study Segment 8 splits off south of ATSI's existing Structure 995, running northwest through agricultural fields for approximately 0.30 mile. This study segment crosses Quarry Creek and crosses under ATSI's existing single circuit Beaver-Carlisle 345 kV Transmission Line and double circuit Beaver-Greenfield 138 kV and Beaver-Davis Besse 345 kV Transmission Lines. This study segment takes advantage of open agricultural fields and avoids running close to residential structures.

Study Segment 9 splits off from the existing 138 kV corridor just north of I-90, running west for approximately 0.27 mile through an agricultural field and crossing under ATSI's existing single circuit Beaver-Carlisle 345 kV Transmission Line and double circuit Beaver-Greenfield 138 kV and Beaver-Davis Besse 345 kV Transmission Lines. Study Segment 9 then turns north for approximately 0.36 mile, running between ATSI's double circuit Beaver-Greenfield 138 kV and Beaver-Davis Besse 345 kV Transmission Lines and single circuit Carlisle-Shinrock 138 kV Transmission Line and crossing over Middle Ridge Road. This study segment takes advantage of open agricultural fields and paralleling existing transmission line infrastructure.

Study Segment 10 starts in the middle of an agricultural field and runs north for approximately 0.32 mile along the west side of ATSI's double circuit Beaver-Greenfield 138 kV and Beaver-Davis Besse 345 kV Transmission Lines, crossing over Rice Road. This study segment parallels existing transmission line infrastructure and is located within ATSI's existing right-of-way.

3.3.2 Study Segment Evaluation and Refining the Study Segment Network

Once the initial study segments were developed, geospatial algorithms were applied to determine the suitability scores of each study segment (see Table 3-1). Suitability scores were calculated for each of the three categories (ecological, land use/cultural, and technical) as well as an overall suitability score which took into account the aforementioned categories collectively to assist the siting team in comparing similar study segments. By reviewing and comparing the suitability scores, the siting team could remove study segments that were less suitable (poor scoring), creating a Refined Study Segment Network, and advancing the better scoring study segments onto the next stage in the route development process, resulting in more refined, optimal routes.

Based on the suitability scores, certain segments scored better in specific categories (ecological, land use, technical), but no segments stood out as better or worse overall. Also, because of the distance between the two existing sections of transmission line corridor that need connecting, the number of study segments developed were limited and no two segments were similar enough to eliminate any segments; therefore, all segments were carried forward in the route development process.

Table 3-1. Brownhelm Section Study Segment Suitability Scoring

Study Segment	Length (miles)	Ecological Suitability Score	Land Use Suitability Score	Technical Suitability Score	Overall Suitability Score
1	0.45	2.4	2.72	5.00	3.68
2	0.96	2.24	2.44	5.38	3.23
3	0.42	3.00	2.83	3.71	3.29
4	0.60	2.14	2.47	3.68	2.68
5	0.72	1.88	2.52	2.92	2.35
6	0.06	3.56	2.25	4.88	3.38
7	0.27	3.23	2.29	3.85	3.08
8	0.30	2.00	2.67	3.00	2.67
9	0.63	3.21	2.00	4.13	3.00
10	0.32	1.64	2.12	4.55	2.88

Before moving on to the next step in the route development process, all study segments were reviewed, and minor adjustments were made along the following segments to confirm all routes proposed were feasible from a construction and operational standpoint.:

- **Study Segment 3 –** Shifted approximately 100 to 160 feet south and east to accommodate a planned 150-foot right-of-way from existing Beaver-Henrietta 138 kV Transmission Line right-of-way.
- **Study Segment 4 –** Shifted approximately 130 feet east to accommodate a planned 150-foot right-of-way from existing Beaver-Henrietta 138 kV Transmission Line right-of-way.
- **Study Segment 5 –** Shifted the north end of the segment east because of the shift in Segment 4.
- **Study Segment 9 –** Moved the corner and north/south part of the segment to the west side of the existing Carlisle-Shinrock 138 kV Transmission Line to be able to accommodate an angle structure in the area.

3.3.3 Developing Alternative Routes

Using the Refined Study Segment Network, the siting team compiled the refined study segments into 10 alternative routes (see Table 3-2) for analysis and comparison. The alternative routes described in Table 3-2 represented the most logical, unique combinations of study segments developed for the Project. The alternative routes are shown on Figure 7b.

Table 3-2. Brownhelm Section Alternative Routes

Alternative Route	Study Segments	Length (miles)
1	9-10-1	1.40
2	9-10-2	1.91
3	8-10-1	1.06
4	8-10-2	1.57
5	6-7-10-1	1.10
6	6-7-10-2	1.61
7	6-4-3	1.08
8	7-10-1	1.04
9	7-10-2	1.55
10	5-3	1.14

Alternative Route 1 is approximately 1.40 miles long. The southern endpoint is just north of I-90 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs west for approximately 0.27 mile then runs north for approximately 1.13 miles. This route uses open agricultural fields, avoids residential structures and parallels existing transmission lines. Approximately 55 percent of this route is located within ATSI's existing right-of-way.

Alternative Route 2 is approximately 1.91 miles long and is the longest alternative route. The southern endpoint is just north of I-90 and the northern endpoint is north of North Ridge Road along ATSI's Beaver-Henrietta 138 kV Transmission Line. From the southern endpoint, the route runs west for approximately 0.27 mile then runs north for approximately 0.68 mile before running northwest, then north, then northeast for 0.96 mile. This route uses open fields and avoids the highly congested area of transmission line structures north and south of North Ridge Road.

Alternative Route 3 is approximately 1.06 miles long. The southern endpoint is just south of ATSI's existing Structure 995 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs northwest through agricultural fields for approximately 0.30 mile, then runs north for approximately 0.77 mile. This alternative route crosses Quarry Creek twice but avoids residential structures and parallels existing transmission lines. Approximately 72 percent of this route is located within ATSI's existing right-of-way.

Alternative Route 4 is approximately 1.57 miles long. The southern endpoint is just south of ATSI's existing Structure 995 and the northern endpoint is north of North Ridge Road along ATSI's Beaver-Henrietta 138 kV Transmission Line. From the southern endpoint, the route runs northwest through agricultural fields for approximately 0.30 mile, then runs north for approximately 0.32 mile before running northwest, then north, then northeast for 0.96 mile. This alternative route crosses Quarry Creek twice but avoids the highly congested area of transmission line structures north and south of North Ridge Road.

Alternative Route 5 is approximately 1.10 miles long. The southern endpoint is at ATSI's existing Structure 995 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs north for approximately 0.06 mile then runs west of approximately 0.27 mile, south of four residences, then runs north for approximately 0.77 mile. This alternative route crosses Quarry Creek twice. This route parallels existing transmission lines for almost the entire length and 100 percent of this route is within ATSI's existing right-of-way.

Alternative Route 6 is approximately 1.61 miles long. The southern endpoint is at ATSI's existing Structure 995 and the northern endpoint is north of North Ridge Road along ATSI's Beaver-Henrietta 138 kV Transmission Line. From the southern endpoint, the route runs north for approximately 0.06 mile then runs west for approximately 0.27 mile, south of four residences, then runs north for approximately 0.32 mile before running northwest, then north, then northeast for 0.96 mile. This alternative route crosses Quarry Creek twice but avoids the highly congested area of transmission line structures north and south of North Ridge Road.

Alternative Route 7 is approximately 1.08 miles long. The southern endpoint is at ATSI's existing Structure 995 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs north, for approximately 0.66 mile, cutting between two residences along Rice Road and along the east side of the residential development along Heritage Way, then runs west for approximately 0.42 mile. This alternative route parallels existing transmission line for the entire length.

Alternative Route 8 is approximately 1.04 miles long and is the shortest of the alternative routes. The southern endpoint is north of ATSI's existing Structure 995 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs west for approximately 0.27 mile, south of four residences, then runs north for approximately 0.77 mile. This alternative route crosses Quarry Creek twice. This route parallels existing transmission lines for the entire length and 100 percent of this route is within ATSI's existing right-of-way.

Alternative Route 9 is approximately 1.55 miles long. The southern endpoint is north of ATSI's existing Structure 995 and the northern endpoint is north of North Ridge Road along ATSI's Beaver-Henrietta 138 kV Transmission Line. From the southern endpoint, the route runs west for approximately 0.27 mile, south of four residences, then runs north for approximately 0.32 mile before running northwest, then north, then northeast for 0.96 mile. This alternative route crosses Quarry Creek twice and avoids the highly congested area of transmission line structures north and south of North Ridge Road.

Alternative Route 10 is approximately 1.14 miles long. The southern endpoint is just south of ATSI's existing Structure 995 and the northern endpoint is south of North Ridge Road at the corner of ATSI's Beaver-Henrietta 138 kV Transmission Line (Structure 1112). From the southern endpoint, the route runs northeast through agricultural fields for approximately 0.12 mile then runs north-northwest for approximately 0.60 mile through an undeveloped residential parcel, across Rice Road and through an agricultural field before running north then west for approximately 0.42 mile adjacent to existing transmission lines. This route uses open residential parcels and agricultural fields to avoid transmission line congestion south of Rice Road and parallels existing transmission lines.

4. Comparing Alternative Routes and Selection of a Preferred and Alternate Route

The previous section discussed the incremental process used to develop alternative routes for the Project. In this section, alternative routes were assessed and compared with natural and cultural resources, land uses, and engineering and construction concerns considered. Ultimately, through a quantitative and qualitative analysis and comparison of the alternative routes, including public feedback, the siting team identified a Preferred Route and an Alternate Route for inclusion in the CECPN application to the OPSB.

4.1 Weighted Scoring Evaluation Process

Based on the publicly available data assembled to identify opportunities and constraints for the study area, the siting team developed a set of evaluation criteria to quantitatively compare the 10 alternative routes to one another (Appendix E). The data collected and used to evaluate and compare the routes was chosen based on its relevance to siting a transmission line within the Project's study area.

For comparison of the alternative routes, raw data for each route was collected, quantified, and then normalized to a dimensionless parameter (a "score," as described below). Lower scores indicate "better," higher scores indicate "worse."

Normalizing the data into a score is vital so that all the constraints are directly compared according to the same scale. It also allows the data categories to be weighted as the siting team determines, based on experience in siting numerous transmission projects and the constraints and opportunities identified within the study area. The following formula was used to normalize the raw data:

Normalized Score = ((Xij – Min Valuej) / Range) *100

where: i = xth value in constraint and j = constraint

This normalizing method uses the established range of collected data in a particular category to compare all route options to one another and avoids one constraint category being unintentionally influential.

The next step in this process was to weight the criteria within each category (ecological, land use/cultural, and technical) and across the three categories. Weighting recognizes that under certain circumstances, one evaluation criterion is more important, or relevant, in determining an outcome than another. The criteria weighting values were determined by consensus of the siting team and based on the specific Project area setting and primary land uses, and professional judgement of the siting team members' experience routing projects in a similar setting.

Based on the constraints and opportunities identified within the Project area, the siting team determined the following criteria to be most important: number of residences near the route, woodlots (removal), length of route, and paralleling existing transmission lines. These criteria were assigned weighting values that yield the most influence on the final route scores. Additional criteria comprising the final route scores can be seen in the graph in Appendix E.

The criteria were measured and calculated to assess potential impacts and benefits. For ecological constraints, impacts to woodlots and NWI wetlands were measured within the proposed right-of-way to account for construction and clearing of trees, while stream impacts were measured by the number of crossings to account for potential permitting requirements. Residences were counted within 100 feet and out to 1,000 feet from the route centerlines to reflect potential direct impacts from the alternative route as well as potential aesthetic impacts. Length of route and paralleling existing transmission line were both measured in units of distance to account for costs and reducing impacts to current land use. In addition, there were various other constraints and attributes that were measured (either in units of distance or total occurrences) along the centerline.

4.2 Comparing Alternative Routes

Once the weighted scoring evaluation process was complete, the siting team evaluated the scoring results, and started evaluating the best candidates for the Preferred and Alternate Routes for the Project. This process requires the most collaboration among the different professional skill sets represented on the team. The route evaluation conducted during this phase of the process combined both the quantitative review as described in the previous section (4.1) as well as a qualitative process, where factors not necessarily represented in the weighted scoring process are evaluated.

4.2.1 Weighted Scoring Results

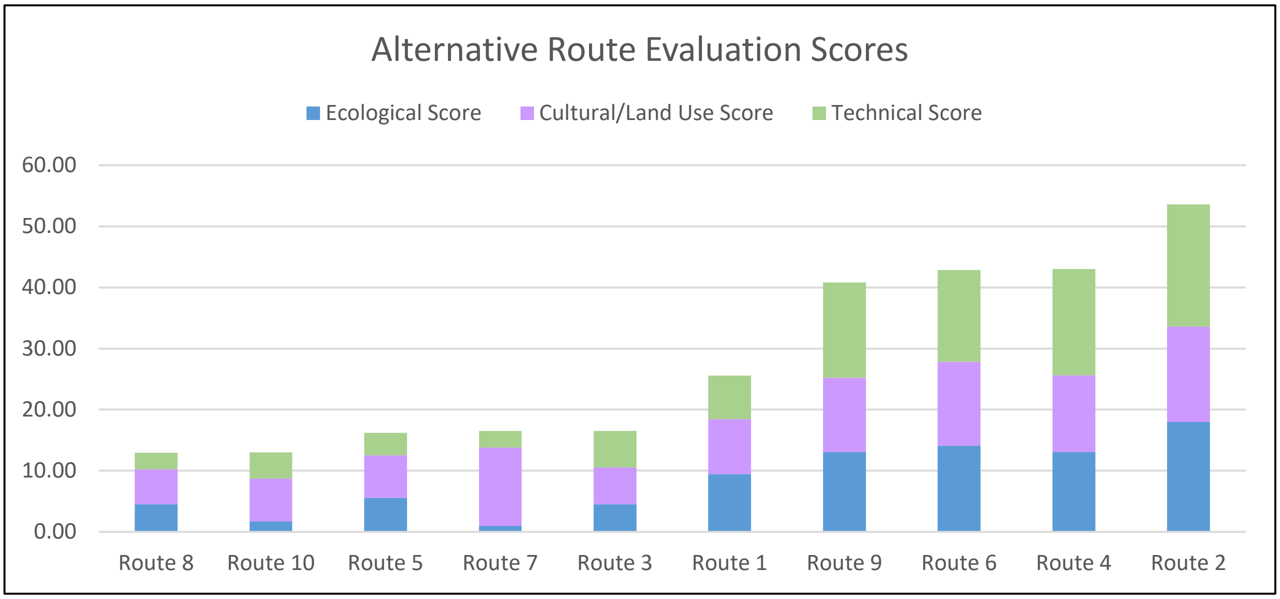
The 10 alternative routes developed from the Project's refined study segment network were evaluated and compared to one another through the quantitative scoring process described in Section 4.1 (Appendix F). Based on the data collected and route scores, the routes were first ranked by individual category (i.e. land use, ecological, technical, and cultural) then ranked by overall score.

Table 4-1 shows the 10 alternative routes sorted by overall score. The scores and ranks by category are also provided. The routes are also presented as a graphic plot in Graph 4-1 which illustrates that the routes ranged in overall score from 12.9 to 53.6. Additionally, Graph 4-1 also shows how each of the routes scored in each of the three categories.

Table 4-1. Brownhelm Section Alternative Route Evaluation Scores

Routes (Study Segments)	Ecological Score	Ecological Rank	Land Use/ Cultural Score	Land Use/ Cultural Rank	Technical Score	Technical Rank	Final Score	Overall Rank
Route 8 (7-10-1)	4.5	3	5.7	1	2.7	2	12.9	1
Route 10 (5-3)	1.7	2	7.0	3	4.3	4	13.0	2
Route 5 (6-7-10-1)	5.6	5	7.0	3	3.6	3	16.2	3
Route 7 (6-4-3)	1.0	1	12.9	8	2.7	1	16.5	4
Route 3 (8-10-1)	4.5	4	6.0	2	6.0	5	16.5	5
Route 1 (9-10-1)	9.5	6	9.0	5	7.1	6	25.6	6
Route 9 (7-10-2)	13.0	7	12.1	6	15.6	8	40.8	7
Route 6 (6-7-10-2)	14.1	9	13.7	9	15.0	7	42.8	8
Route 4 (8-10-2)	13.1	8	12.6	7	17.4	9	43.0	9
Route 2 (9-10-2)	18.0	10	15.6	10	20.0	10	53.6	10

Graph 4-1. Alternative Route Evaluation Scores



Route 8 (study segments 7-10-1) was identified as the top-ranked route resulting from the weighted scoring process. Route 8 is the shortest route at 1.04 miles long and has the least area of woodlot within the right-of-way, no residences are within 100 feet of centerline, and there are fewer residences within 1,000 feet of centerline than most of the routes (74, compared to a range of 64-92). Route 8 also parallels existing transmission lines the entire length of the route. Route 5 (study segments 6-7-10-1) is almost identical to Route 8 but includes an additional 0.06 mile for study segment 6 and an additional turn angle greater than or equal to 45 degrees. Because of these added components, Route 5 scored slightly higher (ranked third).

Route 10 (study segments 5-3) scored second in the ranking. Route 10 has the least amount of NWI wetlands within the right-or-way (0.08 acre), one resident within 100 feet of centerline, fewer residences within 1,000 feet of centerline (71, compared to a range of 64-92), crosses the fewest number of property owners (eight), and parallels an existing 138 kV transmission line for approximately 45 percent of the length.

Routes 9, 6, 4, and 2 were identified as the bottom ranking routes based on results from the scoring process. All four routes had the highest ecological, land use/cultural, and technical scores. This was primarily because these routes including study segment 2, which greatly increased the length and impact of the routes compared to routes without this study segment.

4.2.2 Alternative Routes Discussion

The siting team met on December 2, 2019 to discuss all the alternative routes and select the two alternative routes to advance to the next siting step involving public input in a public information meeting. The team considered both the quantitative scores and ranks as well as qualitative factors.

As discussed in Section 4.2.1, routes 9, 6, 4, and 2 were the bottom ranking routes. Although all four routes avoid the highly congested area of transmission line structures north and south of North Ridge Road, ATSI can feasibly construct a transmission line in this area; however, ATSI could not justify the additional impacts to natural resources and land use/cultural resource as a result of the additional length of these routes. Therefore, these four routes were dropped from consideration.

Based on the weighted scoring, Route 8 is the best ranked route based on quantitative data, as discussed in Section 4.2.1. The siting team also pointed out that Route 8 is located entirely within ATSI's existing easement; therefore, no additional easement would need to be acquired from property owners. Based on these factors, the siting team agreed that Route 8 was one of the two alternatives to present to the public for comment.

Because Route 8 and Route 5 are so similar, the siting team discussed the need for including study segment 6 for further evaluation. Based on feedback from ATSI's transmission engineering team members, study segment 6 includes an area that would replace an existing conductor; therefore, there would be no change in the circuit configuration. Based on this discussion, it was discerned that study segment 6 is not actually "new" infrastructure and the siting team agreed to remove Route 5 from the siting process.

Route 7 (study segments 6-4-3) was identified as the fourth ranked route. The siting team discussed the feasibility of constructing study segment 4 given its proximity to residences and the two existing single circuit transmission lines and structures in the area. Because of the distance between the houses on either side of study segment 4 along Rice Road, there is no room for additional structures; therefore, ATSI would need to construct the transmission line as a triple circuit, combining the two existing single circuits with the proposed transmission line. Based on ATSI's current easement rights, which specify the number of structures and number of circuits allowed in this area, triple circuiting is not feasible along study segment 4. Therefore, Route 7 was removed from consideration.

Route 3 (study segments 8-10-1) and Route 1 (study segments 9-10-1) were identified as the fifth and sixth ranked routes. Both routes are similar to Route 8 except for the southern part of the alignments where both routes cross agricultural fields instead of closer to the residences along Rice Road. Both routes have no residences within 100 feet of centerline but have a higher number of residences within 1,000 feet of centerline (88 and 85, respectively).

As part of the OPSB process and Ohio Administrative Code (OAC) Rule 4906-03-05 which states: two routes shall be considered as alternatives if not more than 20 percent of the routes are in common. The percentage in common shall be calculated based on the shorter of the two routes. Because of this requirement, ATSI is required to identify two route alternatives with less than 20 percent in common. Based on the similarity between Route 3, Route 1, and Route 8, Routes 3 and 1 do not meet the OPSB requirement and therefore were removed from consideration.

The next best scoring route with less than 20 percent in common with Route 8 is Route 10, which ranked second, largely because of the limited environmental impacts and the limited number of houses within 100 feet and 1,000 feet of the centerline. The siting team decided that Route 8 and Route 10 were the best alternative routes to present for comment at the public informational meeting. For the public information meeting, the routes were identified as Alternative 1 (Route 8) and Alternative 2 (Route 10) (Figure 8).

4.3 Public Information Meeting

A public information meeting was conducted for the Project on January 7, 2020 from 6:00 pm to 8:00 pm at the Brownhelm Township Hall, which is approximately 0.28 mile west of the study area. This location was selected because, pursuant to OAC Rule 4906-3-03, the meeting must be held in the area in which the Project is located so that landowners within the Project area could attend. The community was notified about the time and location of the meeting through the following means:

1. All property owners having land crossed by the proposed alternative routes, as well as immediately adjacent landowners were sent letters on December 16, 2019, notifying them of the public information meeting.

2. A notice was also posted in the local newspaper, The Morning Journal, on December 19, 2019, in compliance with OPSB specifications.

The siting team set up stations at the meeting and provided information related to engineering and design of the structures, Project need, real estate and right-of-way information, and the siting process. Detailed maps of the alternative routes were available for viewing and the Project staff members present for questions and listening to comments from the public. Property boundaries were also indicated on the mapping with the unique parcel identification numbers referenced to ownership spreadsheets.

Comment sheets were distributed to all meeting attendees. Attendees were asked to fill out the sheet completely, including contact information. Approximately 32 members of the public attended the public information meeting and 12 comments were collected. Ten additional comments/letters were received by email as of July 10, 2020. The most recent comment was received on April 17, 2020.

Comments from the public information meeting were reviewed and stored in the Project database as a record of meeting attendance and public comments. Public comments received included concerns about impacts on property value, impacts on the community, loss of trees, and questions regarding the possibility of using existing transmission lines in the area (rebuild as double circuit).

4.4 Public Feedback Adjustments

Following the public information meeting, the siting team met on January 20, 2020 to discuss any adjustments based on public feedback. Comments received during the public information meeting took issue with the location of Alternative 2 being within an active agricultural field. The landowners were concerned with the impacts on agricultural operations and natural state of the land that may result from routing the transmission line across the agricultural field. Based on these comments, ATSI reduced the necessary right-of-way width to 65 feet, which minimized the Project's footprint in the agricultural field. Additionally, adjustments were made to Alternate 2 to shift the alignment closer to the existing double circuit 138 kV transmission line to minimize impacts to the agricultural field and forested areas, as well as straighten the alignment within the vacant parcel south of Rice Road to place the transmission line equal distance from neighboring residences. The adjustments made to Alternative 2 are shown on Figure 9.

Because of the adjustments made to Alternative 2 and a reduction in required right-of-way-width to 65 feet, the siting team re-evaluated both Alternative 1 and Alternative 2 by re-calculating the weighted scoring. Based on the revised weighted scoring, Alternative 1 still ranked better than Alternative 2.

4.5 Detailed Engineering Adjustments

Typically, detailed engineering of proposed projects occurs during the OPSB review process and is finalized once the OPSB issues a decision. Often, detailed engineering results in minor route adjustments to the proposed route alignments which may need to be submitted to the OPSB as an amendment, delaying the start of construction. To reduce potential changes to the route alignments following submission of the Application to the OPSB, ATSI began detailed engineering on both route alternatives once adjustments due to landowner feedback were complete.

Minor adjustments made to Alternative 1 and Alternative 2 included the following and are shown on Figure 9.

1. Moved the start of Alternative 1 approximately 660 feet south and the start of Alternative 2 approximately 315 feet south to ATSI's existing Structure 8888. From Structure 8888 to Structure 995, only new conductors and new wires will be installed. There will be no change to the structures.

2. Shifted the section of Alternative 1 that runs east-west approximately 65 feet south to the existing Carlisle-Shinrock 138 kV Transmission Line. This section will now be constructed as double-circuit. This shift avoids boxing in the existing 345 kV structures to the west with 138 kV transmission lines.

3. Shifted the northern section of Alternative 2 approximately 90 feet north and added an additional angle structure for easier take off and connection to the existing transmission line.

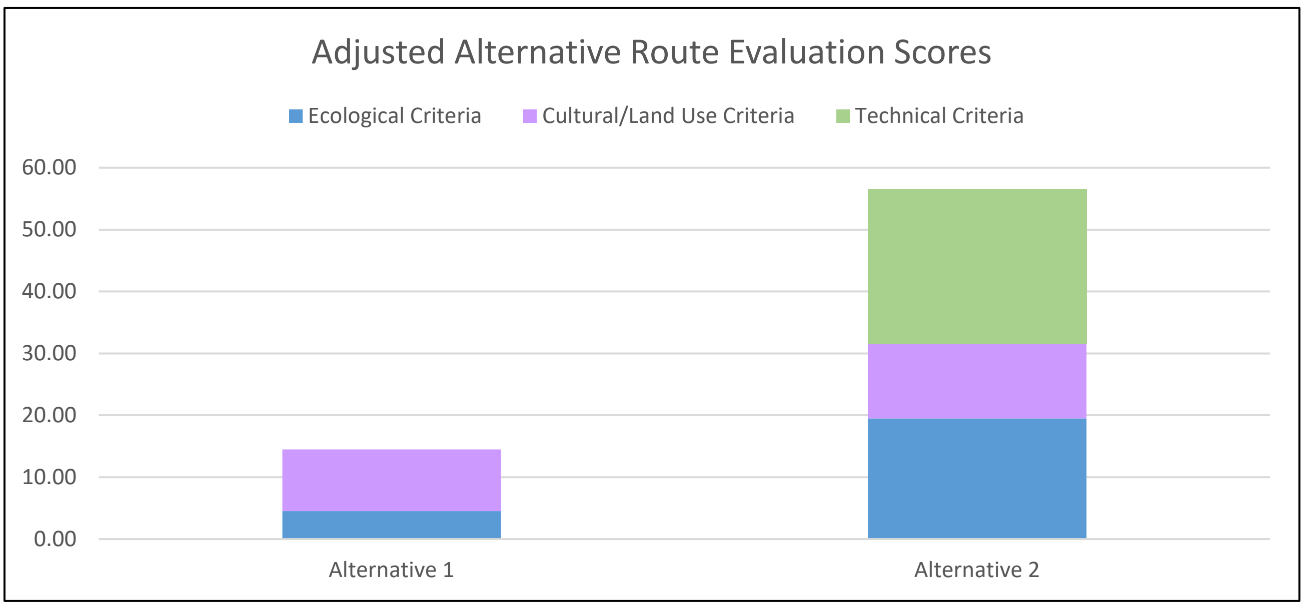
Because of the engineering adjustments made to both Alternative 1 and Alternative 2, the siting team re-evaluated both Alternative 1 and Alternative 2 again by re-calculating the weighted scoring (Appendix F). Up to this point in the siting process, some of the categories were assessed based on desktop data (i.e., NWI wetlands within the ROW, NHD streams crossed). Since ATSI had completed wetland and waterbody surveys along Alternative 1 and Alternative 2 alignments, the siting team choose to use the field survey data to more accurately evaluate and compare the two alternatives.

Table 4-2 shows the alternative routes sorted by overall score. The scores and ranks by category are also provided. The routes are also presented as a graphic plot in Graph 4-2.

Table 4-2. Brownhelm Section Adjusted Alternative Route Evaluation Scores

Route	Ecological Score	Ecological Rank	Land Use/ Cultural Score	Land Use/ Cultural Rank	Technical Score	Technical Rank	Final Score	Overall Rank
Alternative 1	4.5	1	10.0	1	0.0	1	14.5	1
Alternative 2	19.50	2	12.0	2	25.0	2	56.5	2

Graph 4-2. Adjusted Alternative Route Evaluation Scores



Based on the revised weighted scoring, Alternative 1 still ranked better than Alternative 2. Alternative 1 has less woodlot and wetlands within the ROW than Alternative 2 and no residences within 100 feet of centerline. Alternative 1 also parallels more existing transmission line for approximately 90 percent of the route and is the shorter of the two alternatives.

4.6 Selection of the Preferred and Alternate Route

Following the engineering adjustments, the siting team decided on a Preferred Route and an Alternate Route for inclusion in the CECPN application. The siting team selected Alternative 1 as the Preferred Route and Alternative 2 as the Alternate Route (Figure 10). This decision was made based on Alternative 1 having fewer ecological impacts and being located within ASTI's existing right-of-way. The location of Alternative 1 within the existing right-of-way reduces the amount of potential right-of-way that would need to be acquired from landowners. Alternative 1 also has fewer impacts to existing land use (i.e., agricultural, forested) because part of the right-of-way is already maintained for electric transmission lines and the alignment parallels existing electric transmission line for the majority of the length.

4.7 Virtual Public Information Session

Due to delays in filing the Application following the initial public information meeting, ATSI was required to conduct a second public engagement process before filing the Application with the OPSB. Because of the ongoing COVID-19 pandemic and the restrictions on public meetings, ATSI conducted a virtual open house forum (website) between July 15, 2020, and August 14, 2020. This alternative public engagement process was developed and conducted in lieu of an additional in-person public information meeting to maintain a safe environment for everyone involved while providing the community with the chance to gather information and provide feedback on the project. The alternative public engagement process was agreed to by the OPSB on June 1, 2020, through a letter of no objection to ATSI's May 15, 2020 request for waiver of Ohio Administrative Code 4906-3-03(B), and approved by Administrative Law Judge Michael L. Williams on June 9, 2020.

The alternative public engagement process focused on three main components. First, letters were provided to residents and tenants along the proposed project with a basic overview of the project and how it relates to their property. Second, ATSI prepared and posted to the project website a presentation that explores many elements of the project, including identification of the Preferred and Alternate Routes. Finally, ATSI provided several avenues for members of the community to communicate questions and concerns including scheduling an individual conference call with ATSI representatives to discuss the project.

Four comments/questions were received between July 15, 2020, and August 14, 2020, and reviewed by the siting team. Public comments/questions received included requests for additional materials to help identify individual properties in relation to the proposed project, questions regarding right-of-way impacts and questions about upgrading transmission lines. No comments were received during this process that changed the analysis or the basis for the selection of the Preferred and Alternate Routes.

5. Conclusion

The siting team conducted a detailed Route Selection Study to identify and evaluate practical transmission alternatives for the Brownhelm Section of the Beaver-Wellington 138 kV Transmission Line Project. Using detailed constraint and opportunity data and through an iterative process, the siting team developed and evaluated 10 alternative routes. The top two scoring alternative routes with less than 20 percent in common were presented at a public information meeting on January 7, 2020. At this meeting Route 8, designated as the Alternative 1, and Route 10, designated as Alternative 2, were presented for public comment.

Based on input from landowners during the meeting, Alternative 2 was adjusted to parallel existing transmission line for a greater distance, reducing impacts to an agricultural field and forests. Based on detailed engineering, additional adjustments were made to both Alternative 1 and Alternative 2 to shift the southern endpoint to ATSI's existing Structure 8888, double-circuit the Carlisle-Shinrock 138 kV Transmission Line alignment (Alternate 1) and add an additional angle structure for easier take off and connection to the existing transmission line (Alternate 2).

Despite the changes to Alternative 2, Alternative 2's alignment through an active agricultural field would limit the ability of the landowners to continue their production at the same capacity, which was a concern for the landowner. Additionally, Alternative 2 would require the acquisition of all new right-of-way. Alternative 1 is located in areas where ATSI already maintains existing right-of-way; therefore, Alternative 2 would comparatively require significantly more greenfield right-of-way acquisition.

Alternative 1 was selected as the Preferred Route because it limited impacts to existing land uses, paralleled existing transmission infrastructure for the majority of its alignment and was located along a corridor where ATSI maintains existing right-of-way. Alternative 2 was selected as the Alternate Route because it would require more greenfield right-of-way acquisition and have a greater impact on agricultural and forested areas.

The Preferred and Alternate Routes were presented as such during the second public engagement process and no comments were received that changed the analysis of these routes or their location.

Figures

Contains Privileged Information: Do Not Release

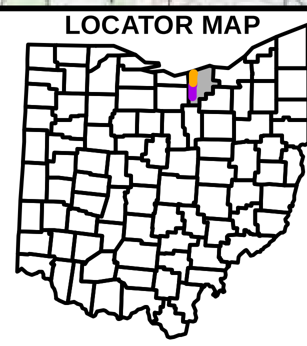
LEGEND:

- Substation
- Preferred Route
- Alternative Route
- Beaver-Henrietta 138kV Transmission Line
- Brookside-Henrietta 138kV Transmission Line
- Study Area

Wellington Substation Expansion

- Proposed Expansion
- Existing Fenceline
- Possible Limits of Disturbance

LOCATOR MAP



N

BASE MAP SOURCE:
Esri USA Topo Map

0 1.5 3
MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project

Figure 1
Overview Map

4/30/2020

Jacobs

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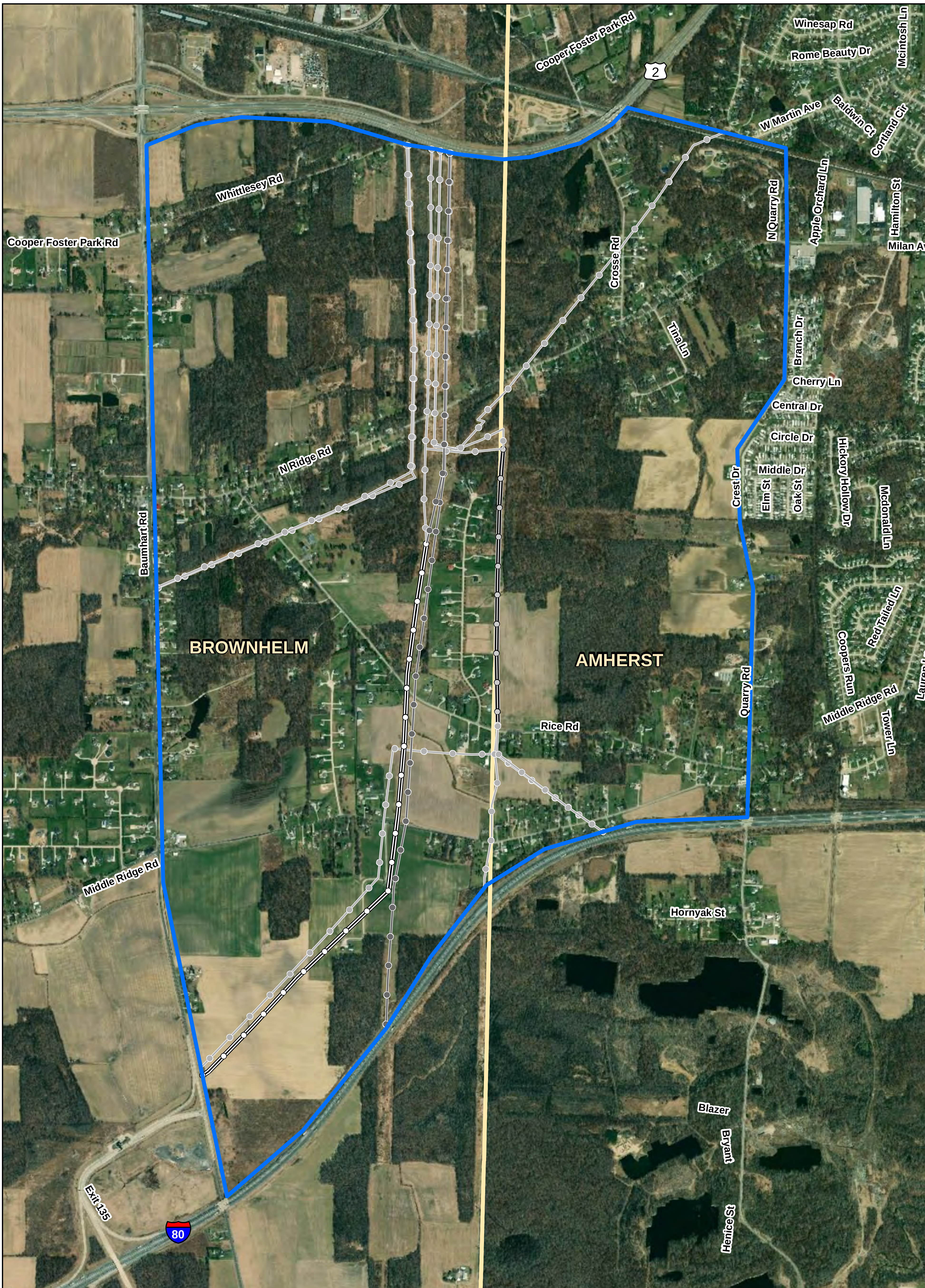


LEGEND:

Study Area

Township Boundary

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

N

0 0.125 0.25 0.5

MILES

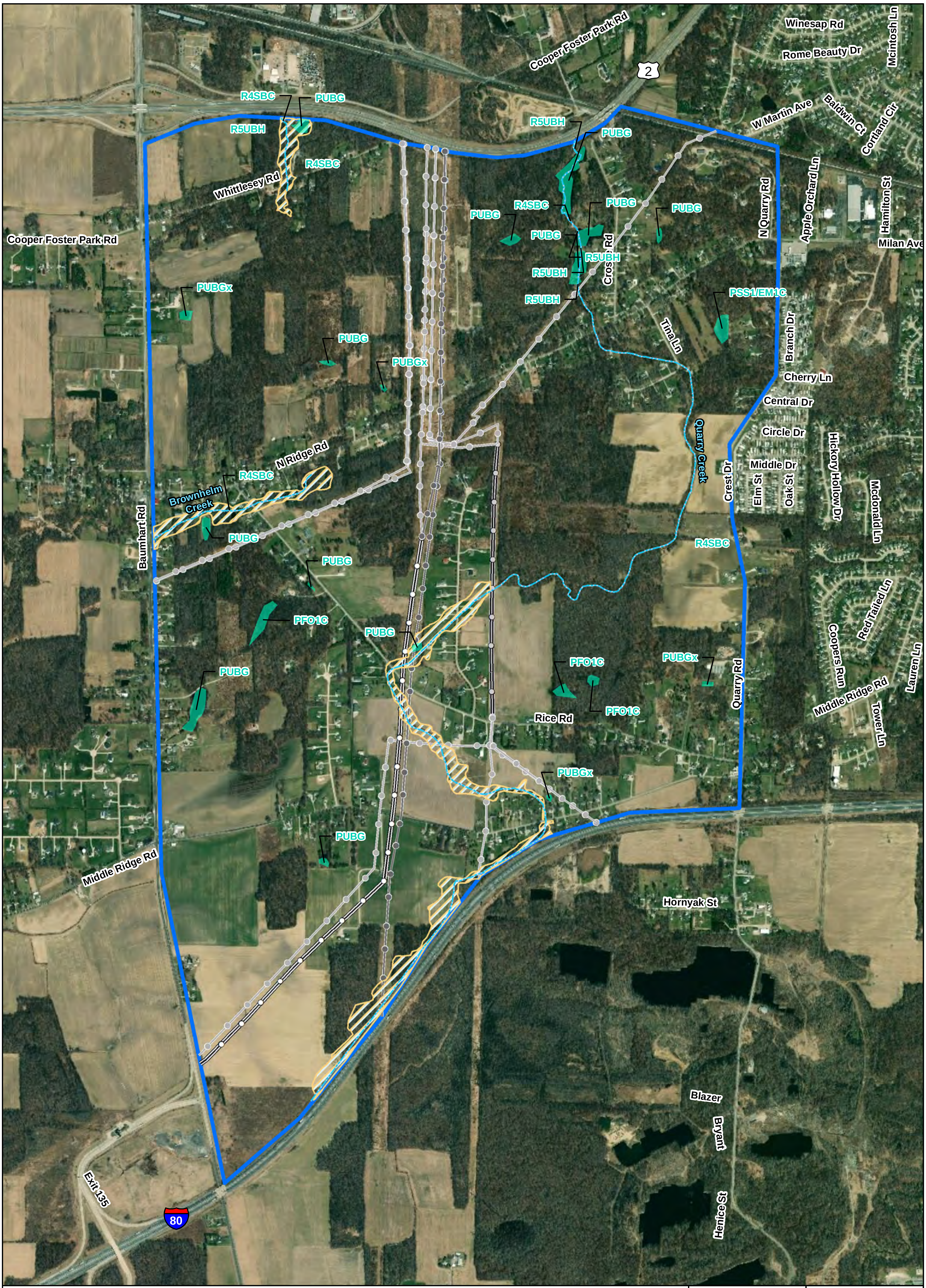
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 2
Study Area

2/17/2020

Jacobs



LEGEND:

- Study Area

Existing Transmission Lines

- 138kV
- 345kV
- Double Circuit - 138kV/345kV
- Double Circuit - 138kV
- NHD
- NWI
- FEMA Floodplain

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 3
Environmental Resources within the Study Area

2/17/2020

Jacobs

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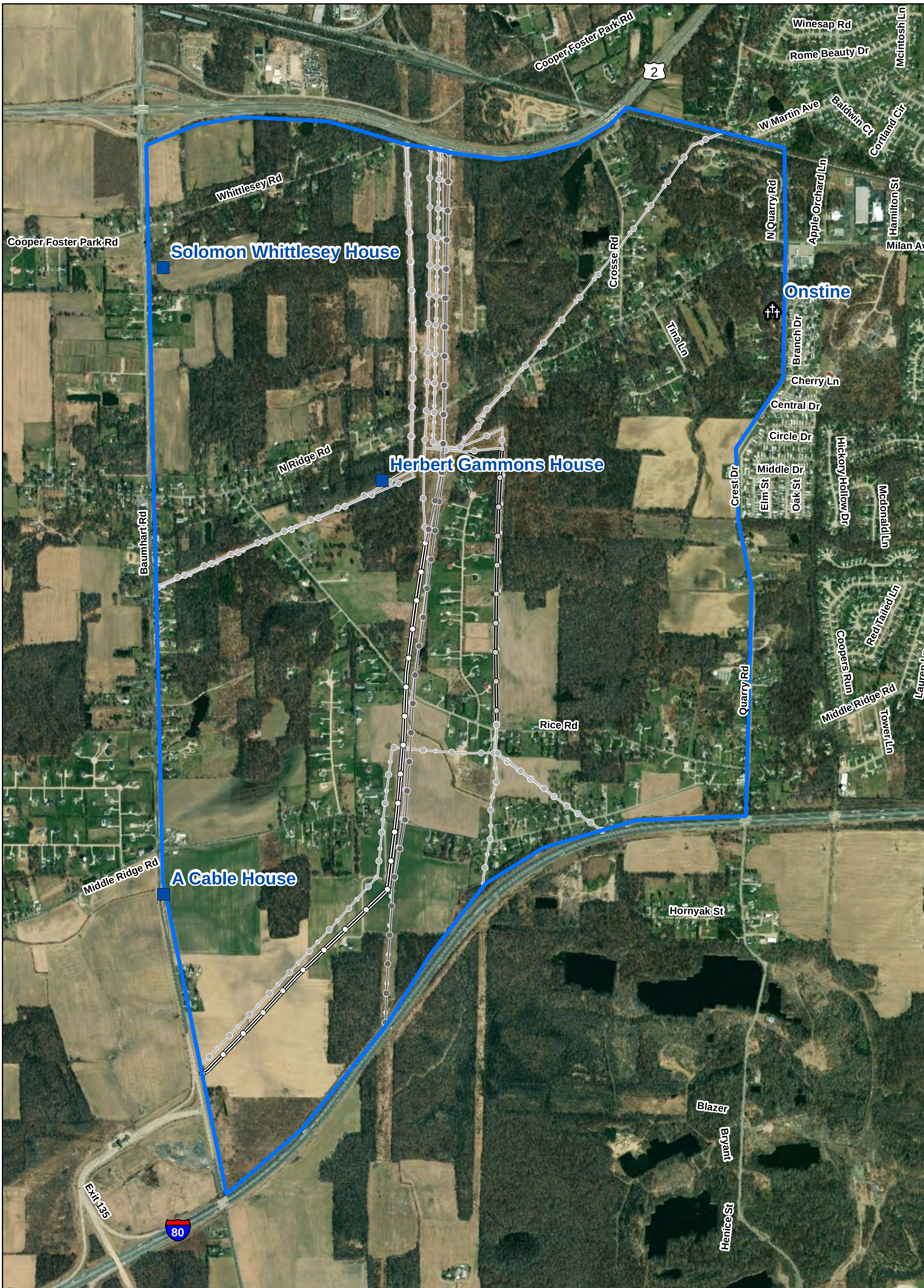

LEGEND:

Study Area

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

Cemetery

Historic Structure

N

0 0.125 0.25 0.5

MILES

Cultural Resources Data:
OHPO Online Mapping System, accessed 10/15/2019

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 4
Architectural and Historic Resources within the Study Area

2/17/2020

Jacobs

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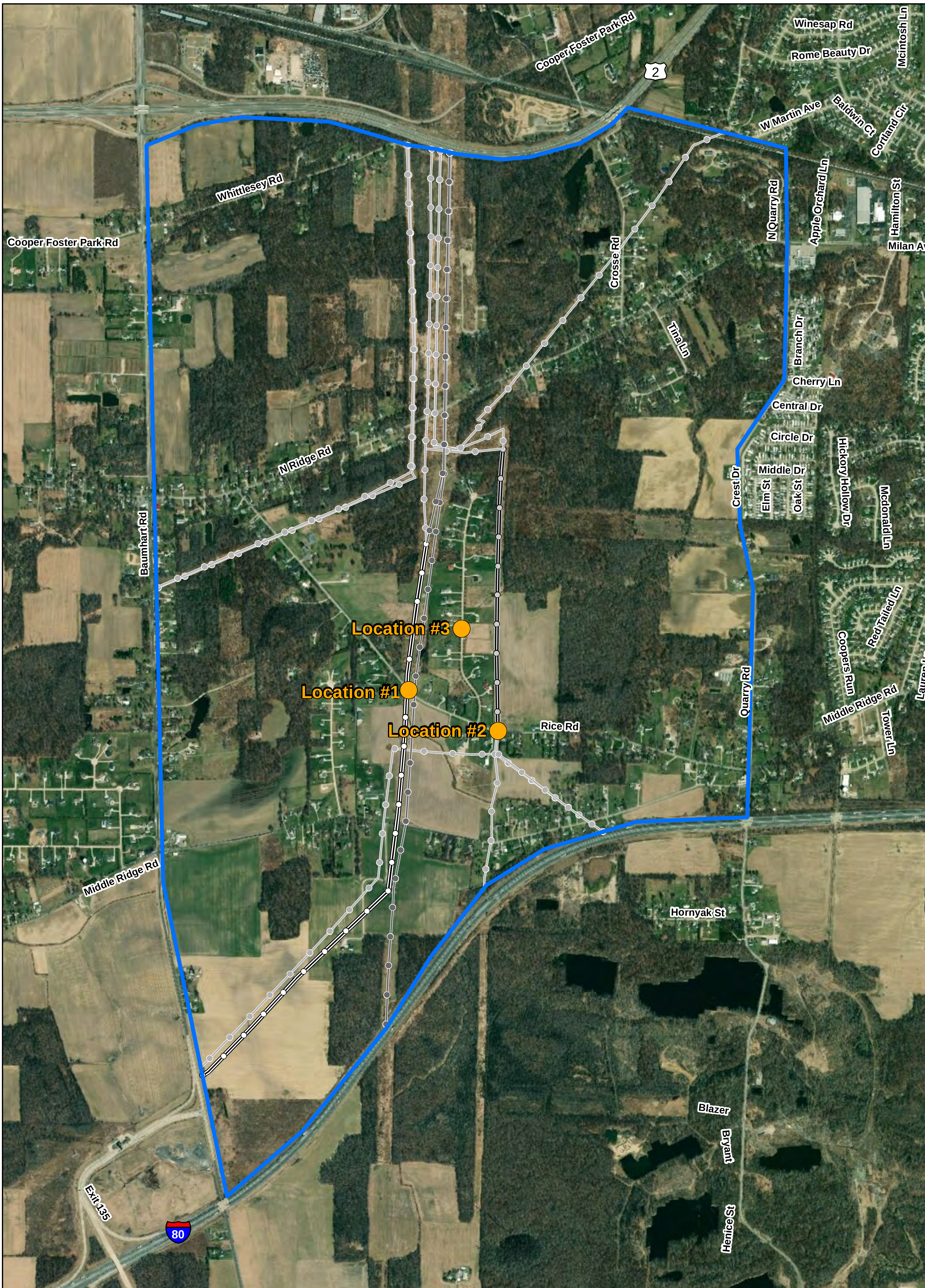

LEGEND:

Study Area

Field Review Locations

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 5
Field Review Locations

2/17/2020

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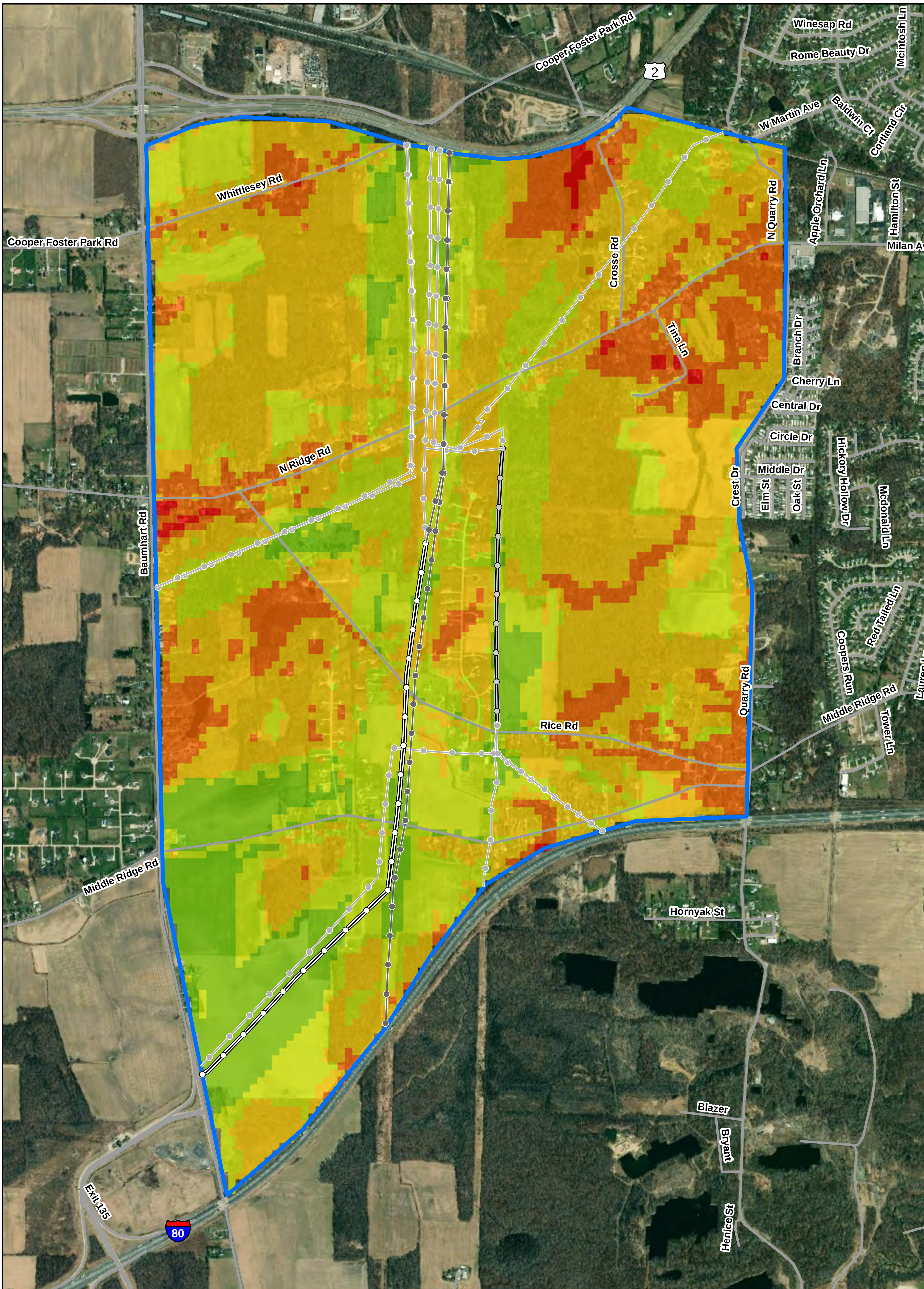

LEGEND:

Study Area

Road

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

Suitability Model

Value

Least Suitable

Most Suitable

N

0 0.15 0.3

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 6
Overall Suitability Model

2/17/2020

Jacobs

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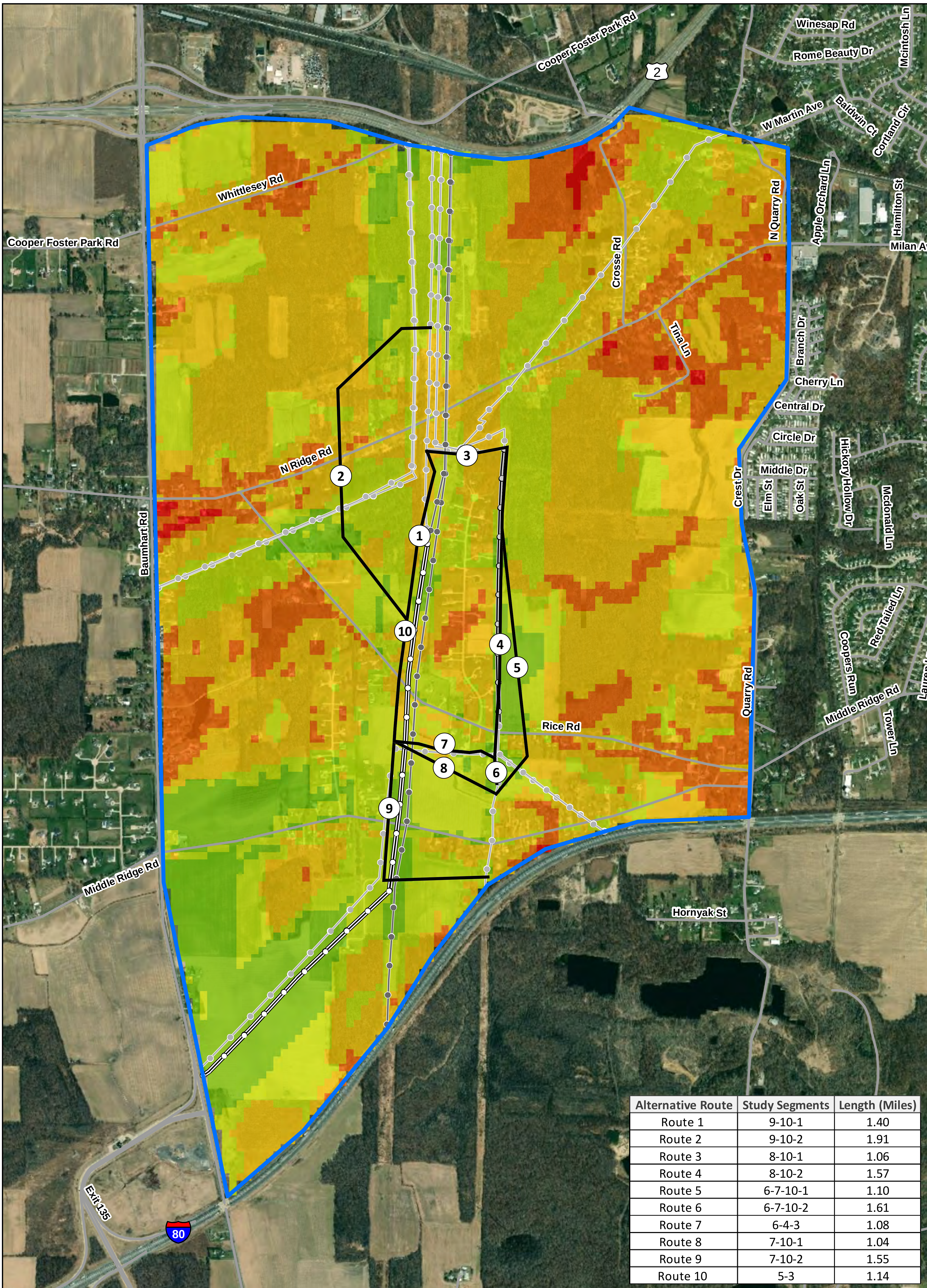

Alternative Route	Study Segments	Length (Miles)
Route 1	9-10-1	1.40
Route 2	9-10-2	1.91
Route 3	8-10-1	1.06
Route 4	8-10-2	1.57
Route 5	6-7-10-1	1.10
Route 6	6-7-10-2	1.61
Route 7	6-4-3	1.08
Route 8	7-10-1	1.04
Route 9	7-10-2	1.55
Route 10	5-3	1.14

LEGEND:

Study Area

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

1 Study Segment Number

Alternative Routes

Road

Suitability Model

Value

Least Suitable

Most Suitable

N

0 0.15 0.3

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 7a
Study Segment Network
and Alternative Routes

2/21/2020

Jacobs

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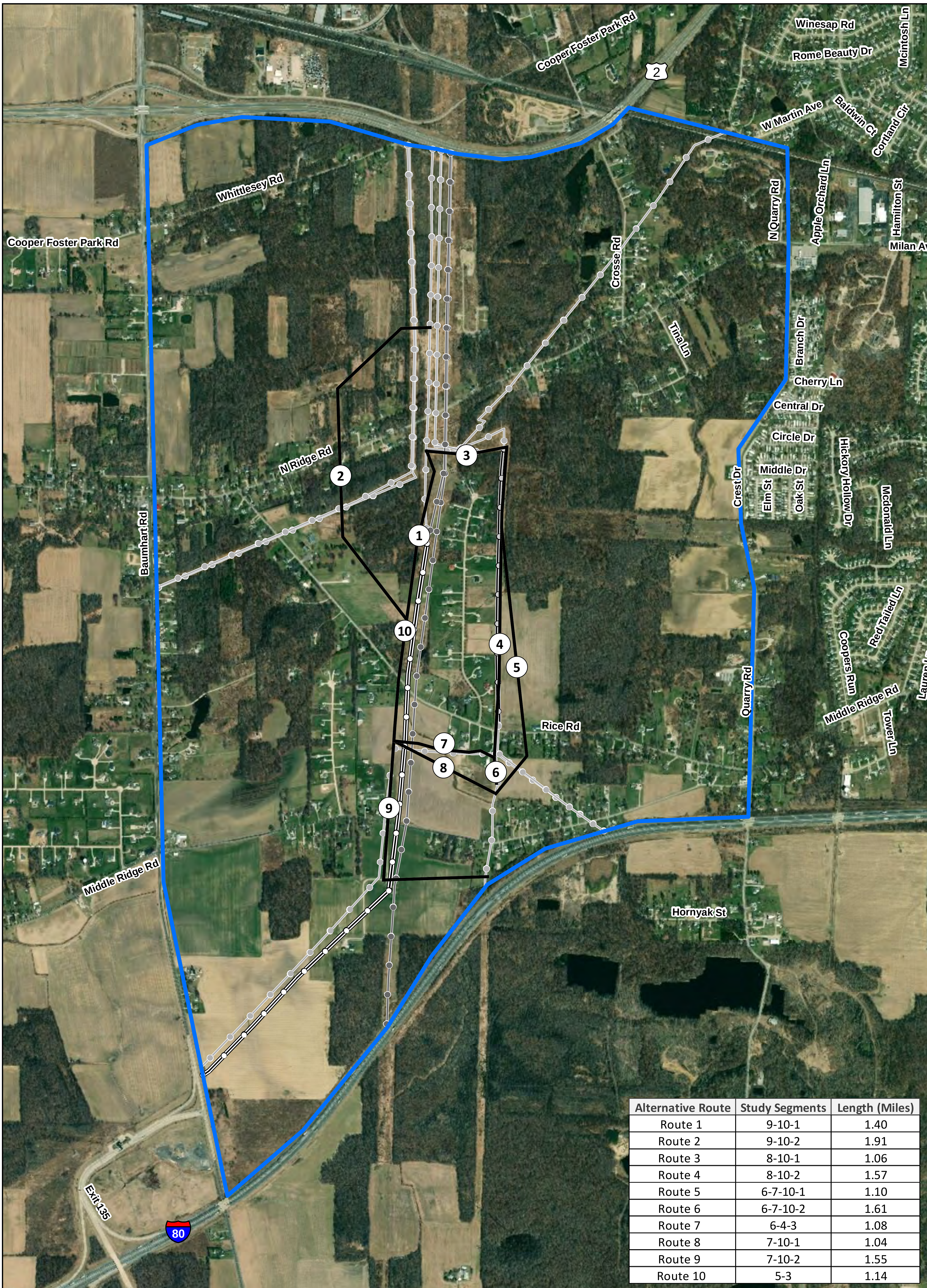

Alternative Route	Study Segments	Length (Miles)
Route 1	9-10-1	1.40
Route 2	9-10-2	1.91
Route 3	8-10-1	1.06
Route 4	8-10-2	1.57
Route 5	6-7-10-1	1.10
Route 6	6-7-10-2	1.61
Route 7	6-4-3	1.08
Route 8	7-10-1	1.04
Route 9	7-10-2	1.55
Route 10	5-3	1.14

LEGEND:

Study Area

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

1 Study Segment Number

Alternative Routes

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 7b
Study Segment Network and Alternative Routes

2/21/2020

Jacobs

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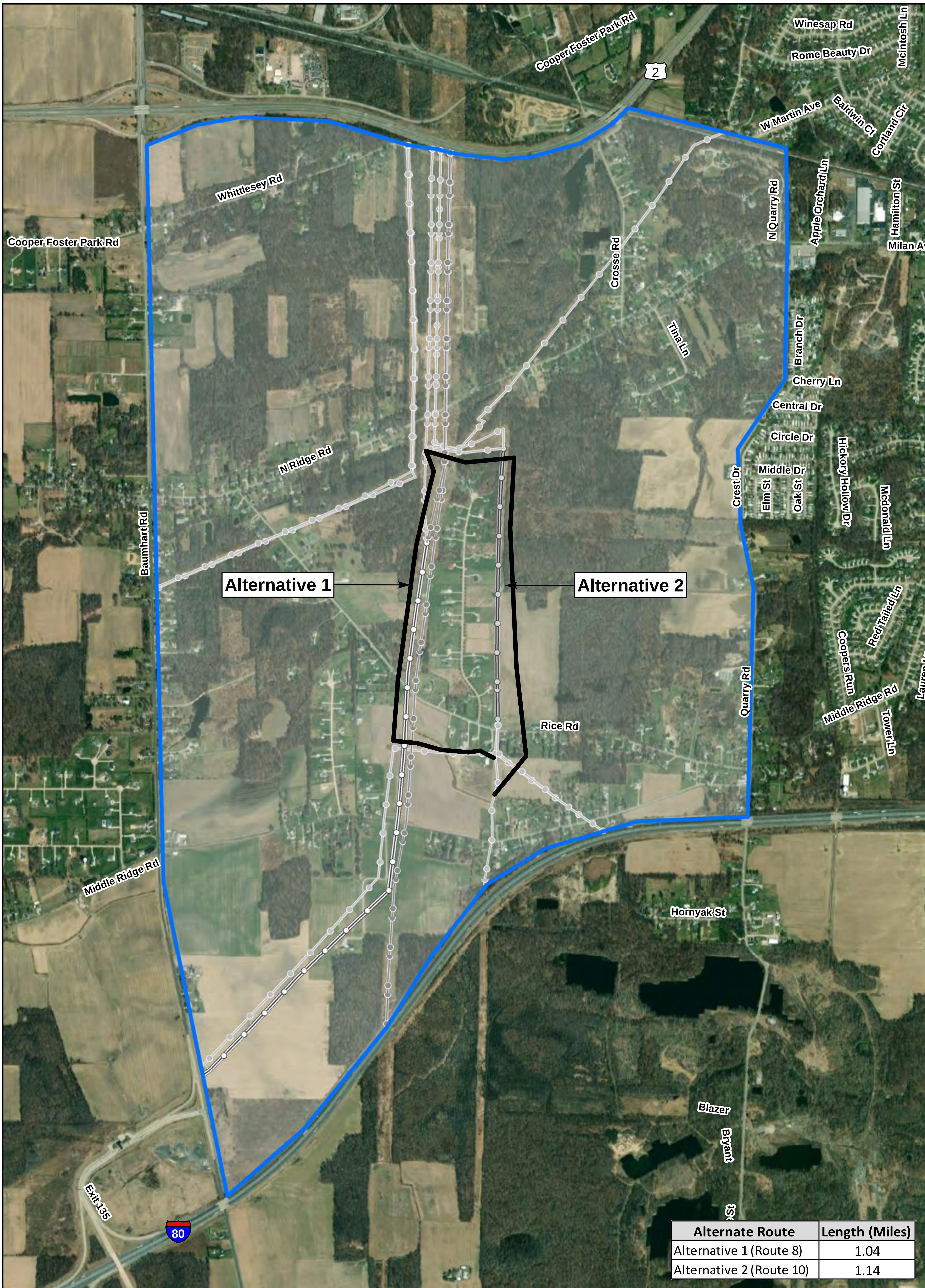

Alternate Route	Length (Miles)
Alternative 1 (Route 8)	1.04
Alternative 2 (Route 10)	1.14

LEGEND:

Study Area

Alternative Routes

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 8

Alternative 1 and Alternative 2

7/8/2020

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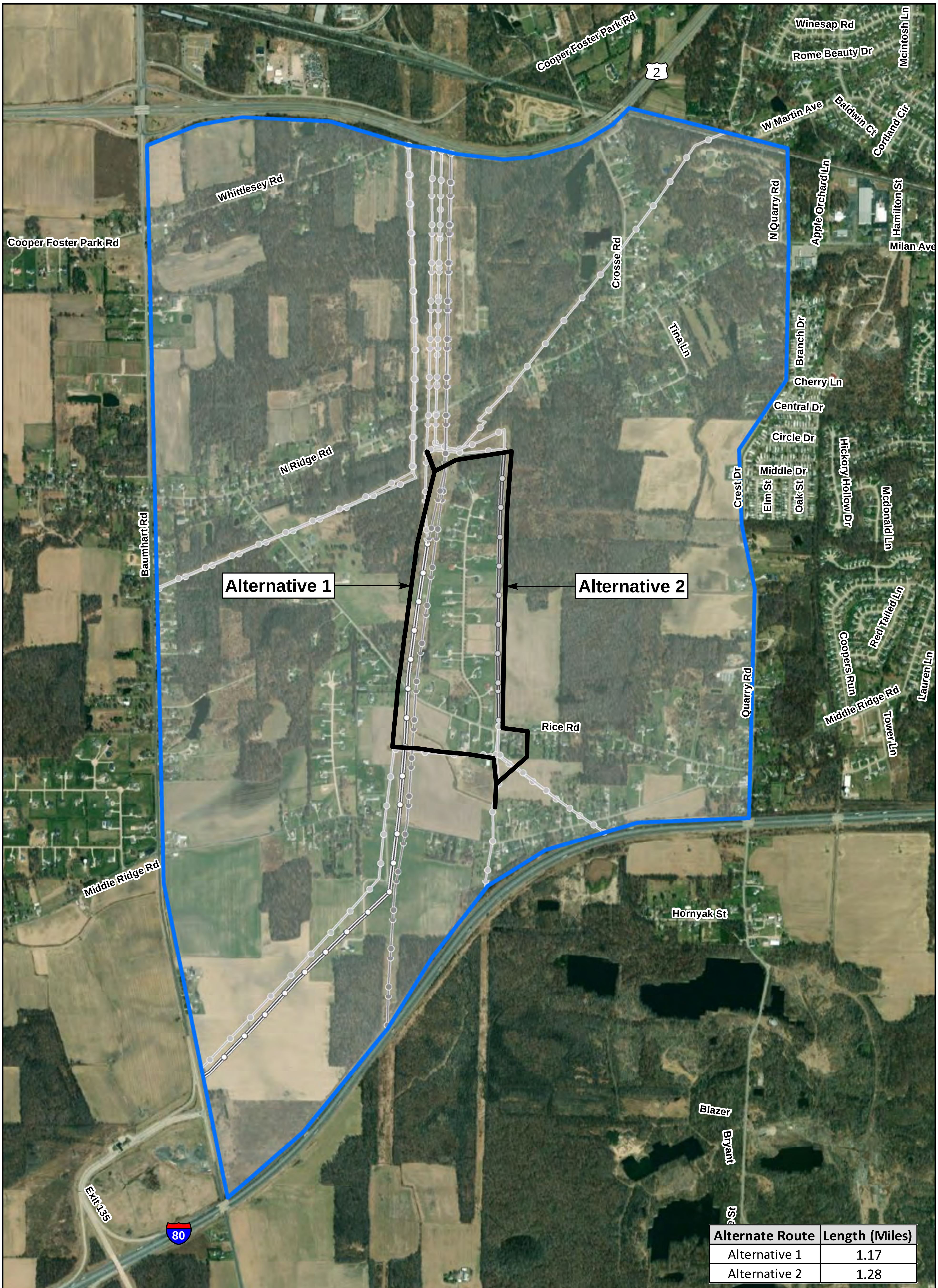

Alternate Route	Length (Miles)
Alternative 1	1.17
Alternative 2	1.28

LEGEND:

Study Area

Alternative Routes

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 9
Alternative 1 and Alternative 2 Adjustments

7/2/2020

Jacobs

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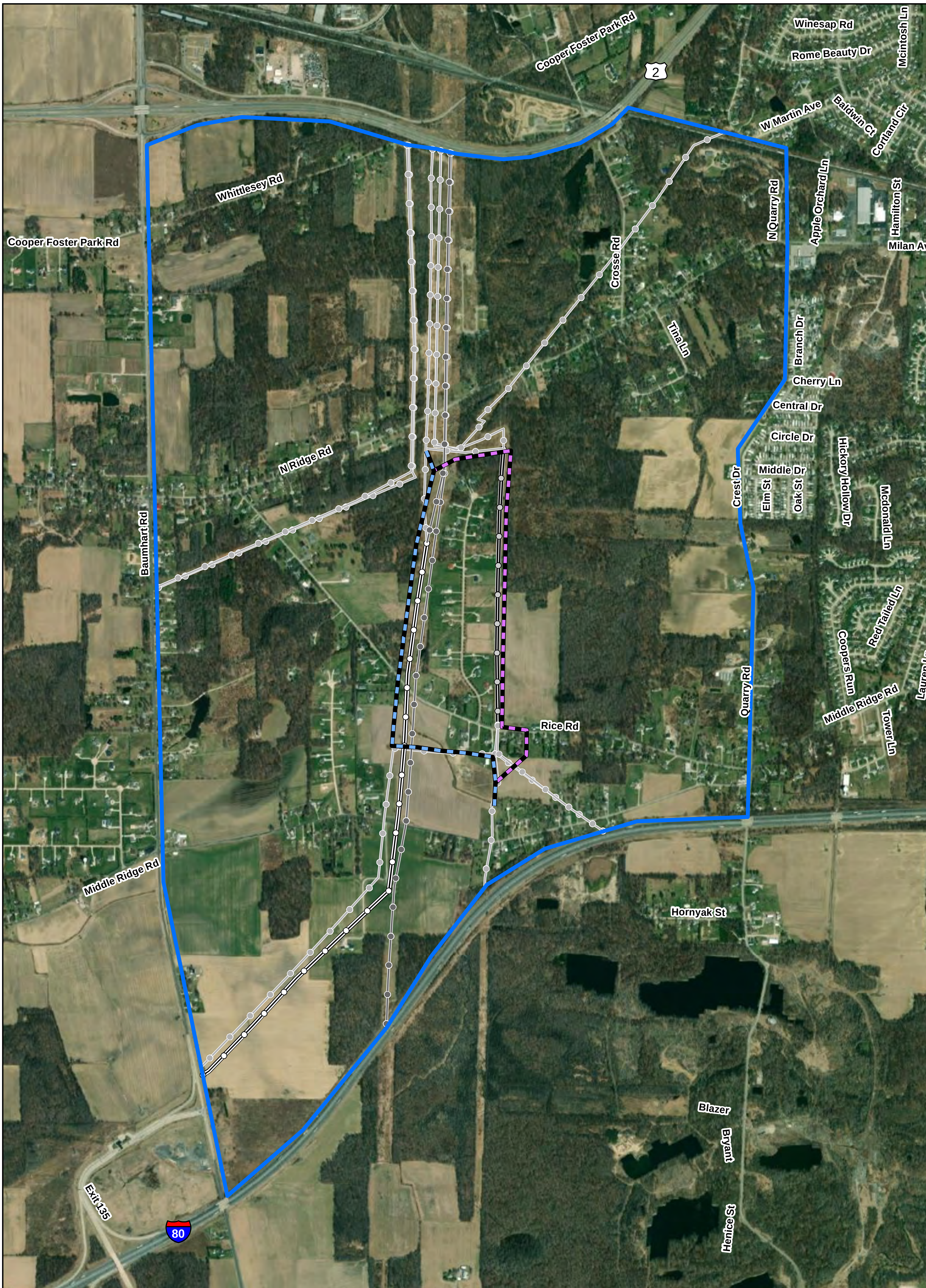

LEGEND:

Study Area

Existing Transmission Lines

138kV

345kV

Double Circuit - 138kV/345kV

Double Circuit - 138kV

Preferred Route

Alternative Route

N

0 0.125 0.25 0.5

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Brownhelm Section)

Figure 10
Preferred and Alternate Routes

7/8/2020

Jacobs

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Appendix A. Siting Team

Appendix A. Beaver-Wellington 138 kV Transmission Line Project Siting Team

Name	Title	Organization	Expertise	Project Role
Nataliya Bryksenkova	Engineer IV Transmission Design	FirstEnergy	Siting	Project Siting Lead
Scott Humphrys	Supervisor, Transmission Siting	FirstEnergy	Siting	Siting Support
Ryann Loomis	Senior Environmental Scientist	Burns & McDonnell	Environmental Permitting	Environmental Lead
Shelly Haugh	Public Engagement Specialist	Burns & McDonnell	Public Engagement	Public Engagement Lead
Jonathan Schultis	Senior Project Manager	Jacobs	Siting, Land Use Planning	Jacobs Siting Lead
Julie Johnson	Environmental Planner	Jacobs	Siting, Land Use Planning	Jacobs Siting Support
Danielle Goetz	GIS Analyst	Jacobs	GIS	Jacobs GIS Lead
Ben Otto	Senior Biologist	Jacobs	Environmental Permitting	Jacobs Environmental Lead
Brian Robertson	Biologist	Jacobs	Environmental Permitting	Jacobs Environmental Support
Amy Favret	Senior Archaeologist	Jacobs	Cultural Resources/ Archaeology	Jacobs Cultural Resources Lead
Jared Tuk	Project Manager	Jacobs	Cultural Resources/ Architectural Resources	Jacobs Cultural Resources Support
Mike Frank	Senior Project Manager	Jacobs	Siting, Environmental Permitting	Jacobs Senior Technical Consultant

Appendix B. GIS Data

Appendix B. GIS Data Sources

Siting Criteria	Source	Description
Land Use		
Parcels	Lorain County Auditors	Land use determination
Residences	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Residences within the study area
Commercial Buildings	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Commercial buildings within the study area.
Land use	National Land Cover Database (2013-2016)	The NLCD (2013-2016) compiled by the Multi-Resolution Land Characteristics Consortium includes 15 classes of land cover from Landsat satellite imagery.
Conservation easements	National Conservation Easement Database (2019)	Private conservation in study areas from the National Conservation Easement Database, which is composed of voluntarily reported conservation easement information from land trusts and public agencies.
Archeological resources	Ohio Historic Preservation Office (OHPO)	Previously identified archeological resources, including those listed or eligible on the NRHP.
Architectural resources	Ohio Historic Preservation Office (OHPO)	Previously identified historic architectural resource sites and districts, including those listed or eligible on the NRHP.
Institutional uses (e.g., schools, places of worship, and cemeteries)	Environmental Systems Research Institute, Lorain County Location Based Response System (LBRS), Google Earth	Places of worship, schools, and cemeteries within the study area.
Airfield and heliports	https://www.faa.gov/ (2019)	Airfields and heliports within study areas
Existing electric transmission lines	FirstEnergy/ Burns and McDonnell Replica	Existing transmission lines within the study area.
Existing pipelines	U.S. Department of Transportation National Pipeline Mapping System	Existing pipelines within the study area.

Natural Environment		
Woodlots	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth) and 2016 NLCD tree canopy	Forest within the study area.
National Hydrography Dataset (NHD) stream and waterbodies	United States Geological Survey National Hydrography Dataset (2019)	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about surface water features such as lakes, ponds, streams, rivers, springs, and wells.
National Wetlands Inventory (NWI) wetlands	United States Fish and Wildlife Services (2019)	NWI produces information on the characteristics, extent, and status of the nation’s wetlands and deepwater habitats.
Floodplains	Federal Emergency Management Agency (2019)	100-year floodplain within the study area
Public lands	The Protected Areas Database of the United States (2019)	Federal, state, and local lands in the study area

Appendix C. USFWS Information for Planning and Conservation (IPaC) and Ohio Threatened and Endangered Species Report

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Lorain County, Ohio

Local office

Ohio Ecological Services Field Office

(614) 416-8993
(614) 416-8994

4625 Morse Road, Suite 104
Columbus, OH 43230-8355

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* This species only needs to be considered if the following condition applies: • Incidental take of the northern long-eared bat is not prohibited at this location. Federal action agencies may conclude consultation using the streamlined process described at https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Endangered
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Bittern Botaurus lentiginosus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 20 to Jul 20

Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Henslow's Sparrow Ammodramus henslowii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds May 1 to Aug 31
Long-eared Owl asio otus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

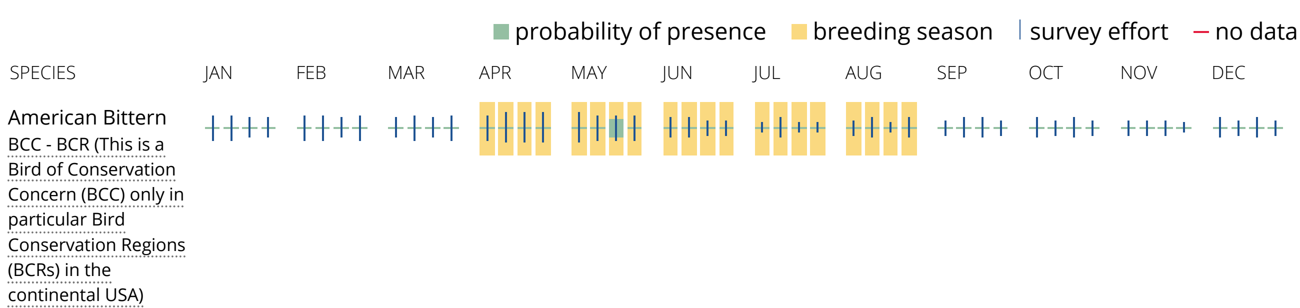
Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

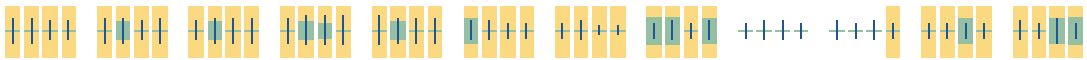
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

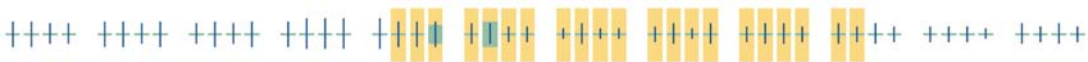
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



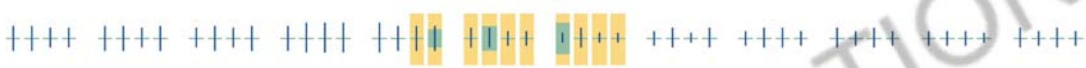
Bald Eagle
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Black-billed Cuckoo
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

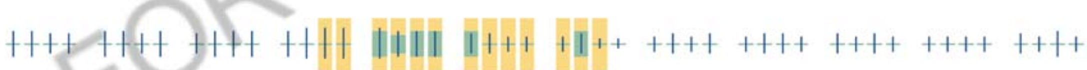


Bobolink
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



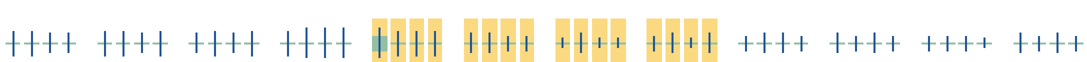
Canada Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Cerulean Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Golden Eagle
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Henslow's Sparrow
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Long-eared Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

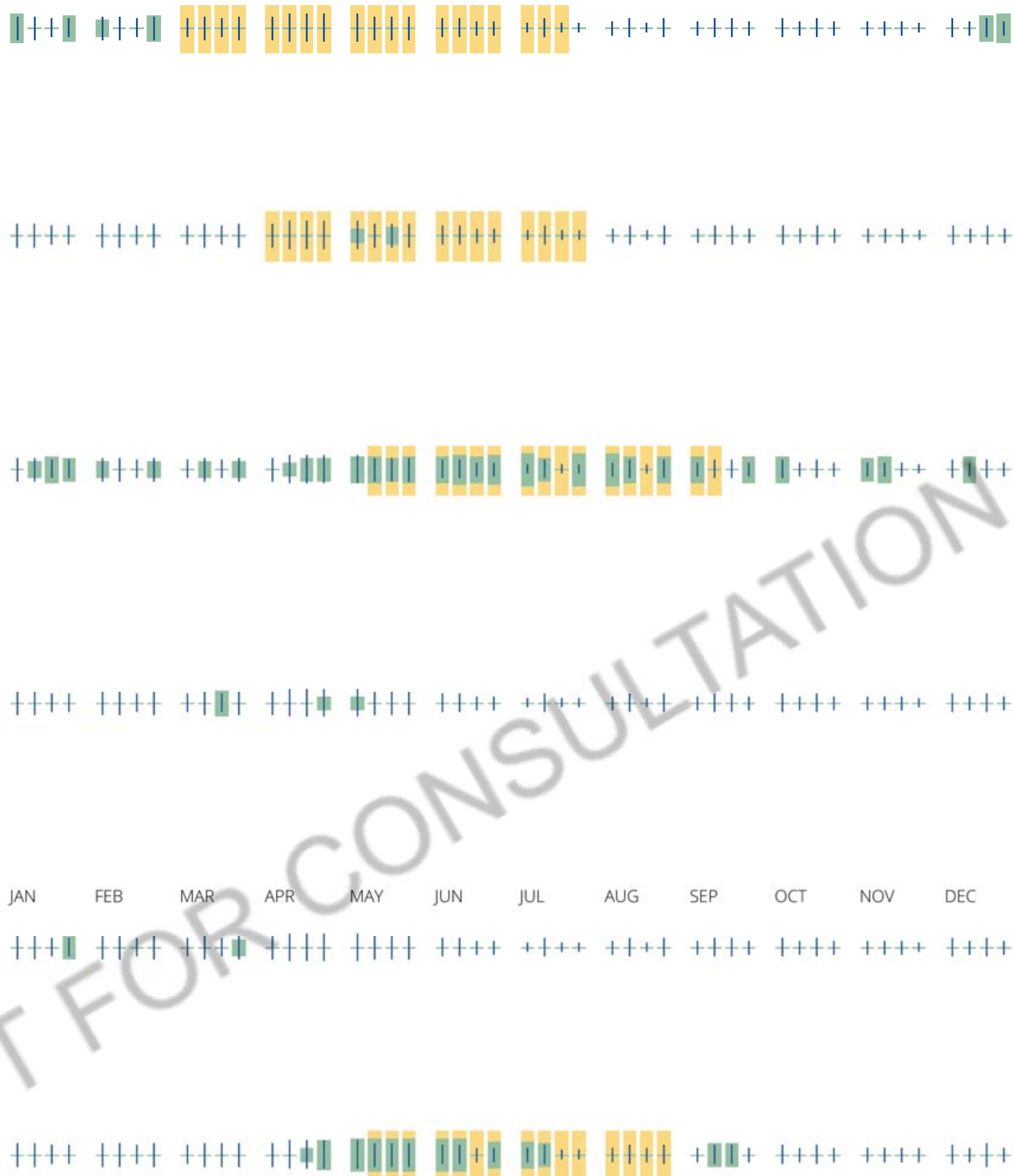
Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

SPECIES

Snowy Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1C
- PSS1/EM1C

FRESHWATER POND
- PUBG
- PUBGx

RIVERINE
- R4SBC
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Lorain County State Listed Animal Species

Scientific Name	Common Name	Group	State Status	Federal Status
Bartramia longicauda	Upland Sandpiper	Bird	Endangered	
Chondestes grammacus	Lark Sparrow	Bird	Endangered	
Acipenser fulvescens	Lake Sturgeon	Fish	Endangered	
Lepisosteus oculatus	Spotted Gar	Fish	Endangered	
Ligumia nasuta	Eastern Pondmussel	Mollusk	Endangered	
Cygnus buccinator	Trumpeter Swan	Bird	Threatened	
Grus canadensis	Sandhill Crane	Bird	Threatened	
Ixobrychus exilis	Least Bittern	Bird	Threatened	
Tyto alba	Barn Owl	Bird	Threatened	
Notropis dorsalis	Bigmouth Shiner	Fish	Threatened	
Percina copelandi	Channel Darter	Fish	Threatened	
Ligumia recta	Black Sandshell	Mollusk	Threatened	
Obliquaria reflexa	Threehorn Wartyback	Mollusk	Threatened	
Clemmys guttata	Spotted Turtle	Reptile	Threatened	
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened	
Hemidactylium scutatum	Four-toed Salamander	Amphibian	Species of Concern	
Cistothorus platensis	Sedge Wren	Bird	Species of Concern	

Data from the Ohio Natural Heritage Database

1/8/2020

Scientific Name	Common Name	Group	State Status	Federal Status
Euphyes bimacula	Two-spotted Skipper	Butterfly	Species of Concern	
Orconectes propinquus	Great Lakes Crayfish	Crayfish	Species of Concern	
Rhinichthys cataractae	Longnose Dace	Fish	Species of Concern	
Lampsilis fasciola	Wavy-rayed Lampmussel	Mollusk	Species of Concern	
Lasmigona compressa	Creek Heelsplitter	Mollusk	Species of Concern	
Catharus guttatus	Hermit Thrush	Bird	Special Interest	
Gallinago delicata	Wilson's Snipe	Bird	Special Interest	
Setophaga magnolia	Magnolia Warbler	Bird	Special Interest	
Vermivora chrysoptera	Golden-winged Warbler	Bird	Special Interest	
Vireo solitarius	Solitary Vireo	Bird	Special Interest	
Wilsonia canadensis	Canada Warbler	Bird	Special Interest	

Appendix D. Field Review Photos

Appendix D. Field Review Photo Log

Location/Description	Photo
Location 1: Existing 345 kV right-of-way corridor looking north from Rice Road. The double-circuit 138 / 345 kV on steel lattice structures are on the west (left) side of the right-of-way. The single circuit 345 kV on wooden poles/H-frame structures is on the east (right) side of the right-of-way. Single-family homes are located on the east and west side of the right-of-way along Rice Road.	
Location 1: Existing 345 kV right-of-way corridor looking south from Rice Road. South of Rice Road, the transmission line right-of-way passes though agricultural fields. Single-family homes are located on the west side of the right-of-way (right side of the photo).	

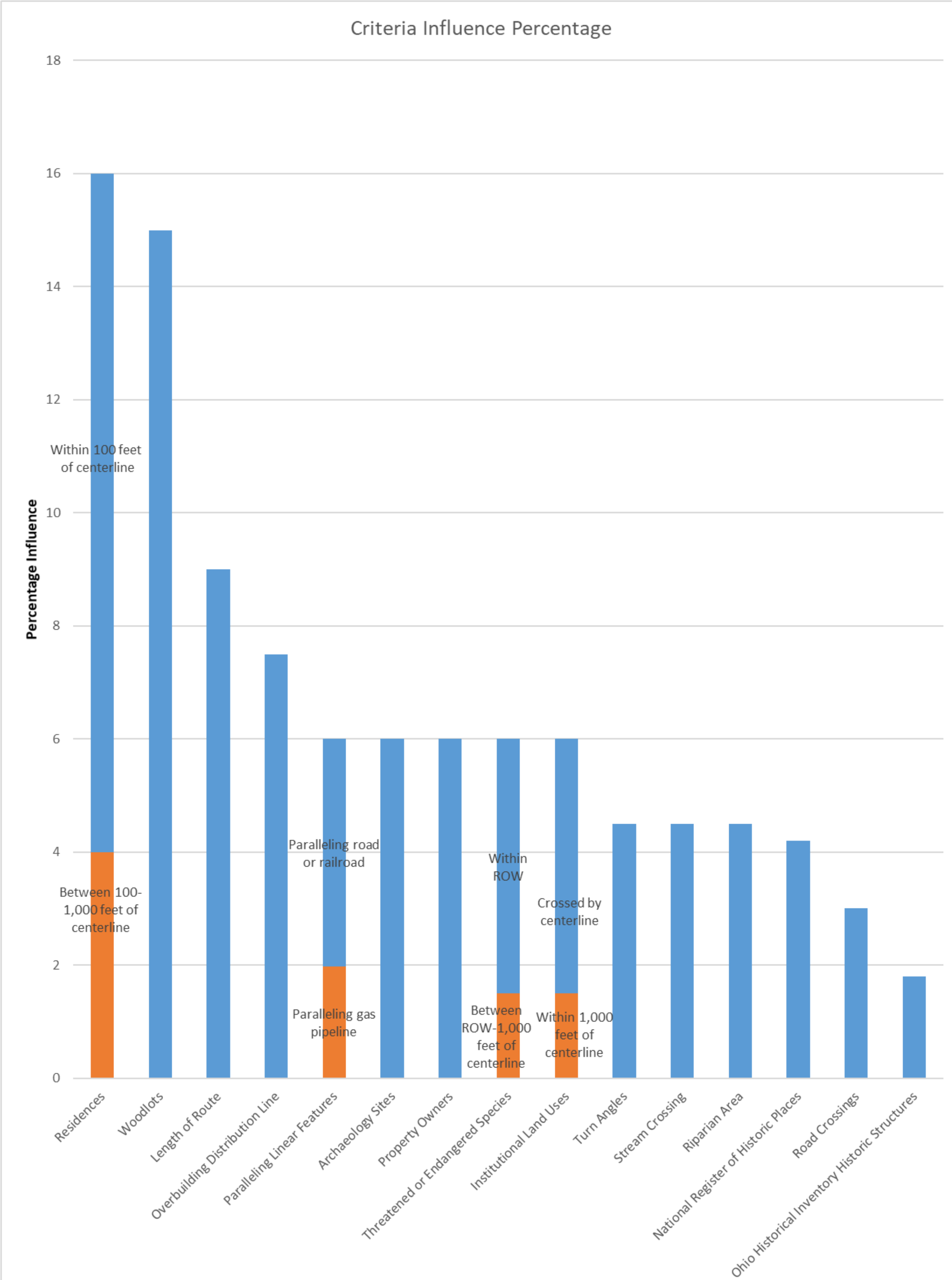
Location/Description	Photo
Location 2: Existing 138 kV right-of-way corridor looking south from Rice Road. South of Rice Road there are a row of single-family residences along Rice Road that are immediately visible in the photo, beyond the homes, the photo shows the transmission corridor continuing into an agricultural area.	
Location 3: Quarry Creek crosses Heritage Way. View to the west. Suburban neighborhood cleared and maintained as residential lawn, including up to the banks of Quarry Creek.	

Appendix E. Evaluation Criteria

Appendix E. Route Selection Study Evaluation Criteria

Criteria	Source	Rational
Ecological		
Area of Woodlots within right-of-way (acres)	2016 National Land Cover Data tree canopy and digitized from Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Trees that would require clearing. OPSB requires report of woodlots, potential loss of habitat, and cost for clearing.
Area of National Wetlands Inventory (NWI) within right-of-way (acres) Delineated wetlands	U.S. Fish and Wildlife Service Jacobs Engineering Group Inc.	Impacts to wetlands triggers additional construction, maintenance, and permitting cost and schedule issues. Agencies seek to avoid, minimize, and then mitigate for impacts to wetlands.
Number of NHD stream crossings Delineated streams	U.S. Geological Survey (USGS) National Hydrography Dataset Jacobs Engineering Group Inc.	May require additional permitting and consultation with Ohio Department of Natural Resources (ODNR).
Number of T&E species within right-of-way and between ROW and 1,000 feet*	ODNR, Division of Wildlife (Ohio Natural Heritage Program)	T&E species and habitat are reviewed by ODNR and OPSB. It is better to avoid known locations in the siting study.
Cultural / Land Use		
National Register of Historic Places (NRHP) within 1,000 feet*	Ohio Historic Preservation Office (OHPO)	OHPO can consider transmission an aesthetic impact to historic structures. Avoid where possible.
Known archaeology sites within 100 feet*	Ohio Historic Preservation Office (OHPO)	Avoidance of archaeological sites minimizes the need for additional archaeological work.
Ohio Historical Inventory structures within 1,000 feet	Ohio Historic Preservation Office (OHPO)	OHPO can consider transmission an aesthetic impact to historic structures. Avoid where possible.
Number of residences within 100 feet and between 100 and 1,000 feet	Digitized from Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Residences and residential areas are avoided where possible; being further away from residences is preferred.
Properties owners crossed by right-of-way	Lorain County Auditor	A lower number of properties crossed is preferred for schedule, cost, and public impact considerations.
Linear feet of institutional land uses crossed* and within 1,000 feet*	Environmental Systems Research Institute (ESRI)	Potential viewshed impacts and required to report on by OPSB.
Technical		
Centerline railroad crossing	ESRI and aerial photograph	Railroad crossing permit during construction.
Turn angles greater than or equal to 45 degrees	Developed from geographic information system (GIS) data	Requires new type of structure and potential for guying.
Length of segment paralleling gas pipeline*	U.S. Department of Transportation National Pipeline Mapping System	Follows existing disturbed corridor and limits fragmentation of property.
Length of segment paralleling road or railroad corridor (in feet)	ESRI	Follows existing disturbed corridor and limits fragmentation of property.
Length of segment paralleling electric transmission line (in feet)	FirstEnergy/ Burns and McDonnell Replica	Follows existing disturbed corridor and limits fragmentation of property.
Length of route (in miles)	Developed from GIS Data	The shorter the length the less to potentially impact and less cost.

*Criteria considered but not within study area for this Project.


Criteria Influence Percentage
Percentage Influence
18
16
14
12
10
8
6
4
2
0
Within 100 feet of centerline
Between 100-1,000 feet of centerline
Paralleling road or railroad
Paralleling gas pipeline
Within ROW
Between ROW-1,000 feet of centerline
Crossed by centerline
Within 1,000 feet of centerline
Residences
Woodlots
Length of Route
Overbuilding Distribution Line
Paralleling Linear Features
Archaeology Sites
Property Owners
Threatened or Endangered Species
Institutional Land Uses
Turn Angles
Stream Crossing
Riparian Area
National Register of Historic Places
Road Crossings
Ohio Historical Inventory Historic Structures

Appendix F. Weighted Scoring Tables

Alternative Route Evaluation

Routes	Study Segments	Ecology: Area of Woodlots within ROW (in acres)	Normalized Score for Area of Woodlots within ROW	Area of NWI within ROW (in acres)	Normalized Score for Area of NWI within ROW	NHD Stream Crossing	Normalized Score for NHD Stream Crossing	Federal or State Endangered or Threatened Species Areas within ROW	Normalized Score for Federal or State Endangered or Threatened Species Areas within ROW (weighted 75%)	Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft	Normalized Score for Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft (weighted 25%)
Route 1	9-10-1	26.19	43	0.26	67	2	0	0	-	0	-
Route 2	9-10-2	35.43	100	0.26	67	2	0	0	-	0	-
Route 3	8-10-1	19.70	3	0.33	90	2	0	0	-	0	-
Route 4	8-10-2	28.94	60	0.33	90	2	0	0	-	0	-
Route 5	6-7-10-1	20.36	7	0.35	100	2	0	0	-	0	-
Route 6	6-7-10-2	29.60	64	0.35	100	2	0	0	-	0	-
Route 7	6-4-3	20.15	6	0.09	2	2	0	0	-	0	-
Route 8	7-10-1	19.22	0	0.35	100	2	0	0	-	0	-
Route 9	7-10-2	28.46	57	0.35	100	2	0	0	-	0	-
Route 10	5-3	21.06	11	0.08	0	2	0	0	-	0	-
	MIN	19.2	0	0.08	0	2	0	0	0	0	0
	MAX	35.4	100	0.35	100	2	0	0	0	0	0
	RANGE	16.2	100	0.27	100	0	0	0	0	0	0

ROW = 150 feet

Routes	Study Segments	Cultural/Land Use: National Register of Historic Places within 1,000-ft of centerline	Normalized Score for National Register of Historic Places within 1,000-ft of centerline	Known Archaeology Sites within 100-ft of centerline	Normalized Score for Known Archaeology Sites within 100-ft of centerline	Ohio Historical Inventory Historic Structures within 1,000 ft of centerline	Normalized Score for Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Residences within 100-ft of centerline	Normalized Score for Residences within 100-ft of centerline (weighted 75%)	Residences between 100 and 1,000-ft of centerline	Normalized Score for Residences between 100 and 1,000-ft of centerline (weighted 25%)	Property Owners Crossed by ROW	Normalized Score for Property Owners Crossed by ROW	Linear Feet of Institutional Land Uses Crossed by centerline**	Normalized Score for Linear Feet of Institutional Land Uses Crossed by centerline (weighted 75%)	Institutional Land Uses within 1,000-ft of centerline**	Normalized Score for Institutional Land Uses within 1,000-ft of centerline (weighted 25%)
Route 1	9-10-1	0	-	0	-	1	0	0	0	85	19	22	100	0	-	0	-
Route 2	9-10-2	0	-	0	-	1	0	1	37.5	89	22	22	100	0	-	0	-
Route 3	8-10-1	0	-	0	-	1	0	0	0	88	21	14	43	0	-	0	-
Route 4	8-10-2	0	-	0	-	1	0	1	37.5	92	25	14	43	0	-	0	-
Route 5	6-7-10-1	0	-	0	-	1	0	0	0	83	17	18	71	0	-	0	-
Route 6	6-7-10-2	0	-	0	-	1	0	1	37.5	88	21	18	71	0	-	0	-
Route 7	6-4-3	0	-	0	-	1	0	2	75	64	0	10	14	0	-	0	-
Route 8	7-10-1	0	-	0	-	1	0	0	0	74	9	18	71	0	-	0	-
Route 9	7-10-2	0	-	0	-	1	0	1	37.5	77	12	18	71	0	-	0	-
Route 10	5-3	0	-	0	-	1	0	1	37.5	71	6	8	0	0	-	0	-
	MIN	0	0	0	0	1	0	0	0	64	0	8	0	0	0	0	0
	MAX	0	0	0	0	1	0	2	75	92	25	22	100	0	0	0	0
	RANGE	0	0	0	0	0	0	2	75	28	25	14	100	0	0	0	0

**Institutional land use includes schools, churches, and hospitals

Routes	Study Segments	Technical: Centerline Road Crossings	Normalized Score for Centerlin Road Crossings	Turn Angles Greater than or Equal to 45 Degrees	Normalized Score for Turn Angles Greater than or Equal to 45 Degrees	Length of Segment Paralleling Exisitng Gas Line ROW (in feet)	Normalized Score for Length of Segment Paralleling Exisitng Gas Line ROW (weighted 33%)	Length of Segment Paralleling Road or Railroad Corridor (in feet)	Normalized Score for Length of Segment Paralleling Road or Railroad Corridor (weighted 67%)	Length of Segment Paralleling Existing Transmission Line (in feet)	Normalized Score for Length of Segment Paralleling Existing Transmission Line	Length of Route (in miles)	Normalized Score for Length of Route	Normalized Ecological Score (30%)	Normalized Cultural/Land Use Score (40%)	Normalized Technical Score (30%)	Final Score	Rank
Route 1	9-10-1	2	50	1	0	0	-	0	-	2716.31	23	1.42	43	9.5	9.0	7.1	25.6	6
Route 2	9-10-2	3	100	3	67	0	-	0	-	1802.51	67	1.93	100	18.0	15.6	20.0	53.6	10
Route 3	8-10-1	1	0	2	33	0	-	0	-	2021.31	57	1.06	3	4.5	6.0	6.0	16.5	5
Route 4	8-10-2	2	50	3	67	0	-	0	-	1107.51	100	1.57	60	13.1	12.6	17.4	43.0	9
Route 5	6-7-10-1	1	0	3	67	0	-	0	-	3209.10	0	1.10	7	5.6	7.0	3.6	16.2	3
Route 6	6-7-10-2	2	50	4	100	0	-	0	-	2295.30	43	1.61	64	14.1	13.7	15.0	42.8	8
Route 7	6-4-3	1	0	1	0	0	-	0	-	2597.68	29	1.09	6	1.0	12.9	2.7	16.5	4
Route 8	7-10-1	1	0	2	33	0	-	0	-	2866.99	16	1.04	0	4.5	5.7	2.7	12.9	1
Route 9	7-10-2	2	50	4	100	0	-	0	-	1953.18	60	1.55	57	13.0	12.1	15.6	40.8	7
Route 10	5-3	1	0	2	33	0	-	0	-	2716.31	23	1.14	11	1.7	7.0	4.3	13.0	2
	MIN	1	0	1	0	0	0	0	0	1108	0	1.0	0					
	MAX	3	100	4	100	0	0	0	0	3209	100	1.9	100					
	RANGE	2	100	3	100	0	0	0	0	2102	100	0.9	100					

Adjusted Alternative Route Evaluation

Routes		Ecology: Area of Woodlots within ROW (in acres)	Normalized Score for Area of Woodlots within ROW	Area of Delineated Wetlands within ROW (in acres)	Normalized Score for Area of NWI within ROW	Delineated Stream Crossing	Normalized Score for NHD Stream Crossing	Federal or State Endangered or Threatened Species Areas within ROW	Normalized Score for Federal or State Endangered or Threatened Species Areas within ROW (weighted 75%)	Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft	Normalized Score for Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft (weighted 25%)
Alternative 1 (Preferred)		1.39	0	0.48	0	4	100	0	-	0	-
Alternative 2 (Alternate)		2.44	100	0.54	100	2	0	0	-	0	-
	MIN	1.4	0	0.48	0	2	0	0	0	0	0
	MAX	2.4	100	0.54	100	4	100	0	0	0	0
	RANGE	1.1	100	0.06	100	2	100	0	0	0	0

ROW = 65 feet

Routes		Cultural/Land Use: National Register of Historic Places within 1,000-ft of centerline	Normalized Score for National Register of Historic Places within 1,000-ft of centerline	Known Archaeology Sites within 100-ft of centerline	Normalized Score for Known Archaeology Sites within 100-ft of centerline	Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Normalized Score for Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Residences within 100-ft of centerline	Normalized Score for Residences within 100-ft of centerline (weighted 75%)	Residences between 100 and 1,000-ft of centerline	Normalized Score for Residences between 100 and 1,000-ft of centerline (weighted 25%)	Property Owners Crossed by ROW	Normalized Score for Property Owners Crossed by ROW	Linear Feet of Institutional Land Uses Crossed by centerline**	Normalized Score for Linear Feet of Institutional Land Uses Crossed by centerline (weighted 75%)	Institutional Land Uses within 1,000-ft of centerline**	Normalized Score for Institutional Land Uses within 1,000-ft of centerline (weighted 25%)
Alternative 1 (Preferred)		0	-	0	-	1	0	0	0	89	25	18	100	0	-	0	-
Alternative 2 (Alternate)		0	-	0	-	1	0	1	75	69	0	9	0	0	-	0	-
	MIN	0	0	0	0	1	0	0	0	69	0	9	0	0	0	0	0
	MAX	0	0	0	0	1	0	1	75	89	25	18	100	0	0	0	0
	RANGE	0	0	0	0	0	0	1	75	20	25	9	100	0	0	0	0

**Institutional land use includes schools, churches, and hospitals

Routes		Technical: Centerline Road Crossings	Normalized Score for Centerlin Road Crossings	Turn Angles Greater than or Equal to 45 Degrees	Normalized Score for Turn Angles Greater than or Equal to 45 Degrees	Length of Segment Paralleling Exisitng Gas Line ROW (in feet)	Normalized Score for Length of Segment Paralleling Exisitng Gas Line ROW (weighted 33%)	Length of Segment Paralleling Road or Railroad Corridor (in feet)	Normalized Score for Length of Segment Paralleling Road or Railroad Corridor (weighted 67%)	Length of Segment Paralleling Existing Transmission Line (in feet)	Normalized Score for Length of Segment Paralleling Existing Transmission Line	Length of Route (in miles)	Normalized Score for Length of Route	Normalized Ecological Score	Normalized Cultural/ Land Use Score	Normalized Technical Score	Final Score	Rank
Alternative 1 (Preferred)		1	0	2	0	0	-	0	0	5580	0	1.17	0	4.5	10.0	0.0	14.5	1
Alternative 2 (Alternate)		1	0	6	100	0	-	341	67	4828	100	1.28	100	19.5	12.0	25.0	56.5	2
	MIN	1	0	2	0	0	0	0	0	4828	0	1.2	0					
	MAX	1	0	6	100	0	0	341	67	5580	100	1.3	100					
	RANGE	0	0	4	100	0	0	341	67	752	100	0.1	100					

Beaver-Wellington 138 kV Transmission Line Project

Route Selection Study (Wellington Section)

August 21, 2020

American Transmission Systems, Incorporated

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Acronyms and Abbreviations

ATSI	American Transmission Systems, Incorporated
CECPN	Certificate of Environmental Compatibility and Public Need
FE	FirstEnergy
FEMA	Federal Emergency Management Agency
GIS	geographic information system
I-	Interstate
IPaC	Information for Planning and Conservation
Jacobs	Jacobs Engineering Group Inc.
kV	kilovolt
MRA	Multiple Resource Area
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
OAI	Ohio Archaeological Inventory
ODNR	Ohio Department of Natural Resources
OGS	Ohio Genealogical Society
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
Project	Wellington Section of the overall project
SR-2	Ohio State Route 2
USCB	U.S. Census Bureau
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1. Introduction and Project Overview

1.1 Nature and Purpose of the Project

American Transmission Systems, Incorporated (ATSI), a FirstEnergy (FE) company, is proposing to develop a new 138 kilovolt (kV) transmission line between the existing Beaver Substation located in the City of Lorain, Lorain County, Ohio, and the existing Wellington Substation, located in Wellington Township, Lorain County, Ohio (Figure 1). The proposed project will be known as the Beaver-Wellington 138 kV Transmission Line and will provide a second 138 kV source to the Wellington Substation. The second transmission source is needed to enhance the reliability, resiliency, efficiency, and operational flexibility of the transmission system in the Wellington, Carlisle, and Seville areas. The project requires an Application for a Certificate of Environmental Compatibility and Public Need (CECPN) be submitted to the Ohio Power Siting Board (OPSB). As part of the CECPN process, a route selection study that analyzes the siting constraints and siting opportunities used to select a Preferred Route and an Alternate Route for the project is required.[1] In accordance with Ohio statutory requirements, this report summarizes the siting process and methodology, and makes a recommendation on a Preferred Route and Alternate Route for Wellington Section of the Project (Project).

Construction of the project consists of three components. These components are:

1. Converting the existing Wellington Substation into a four-breaker ring bus configuration and install a second 138/69 kV transformer. This will require an approximately one-acre expansion to the existing substation.

2. Constructing an approximately one-mile long section (known as the Brownhelm Section) and an approximately six-mile long section (known as the Wellington Section) of new 138 kV transmission line.[2]

3. Reconfiguring (un-six-wire) the existing Brookside-Henrietta 138 kV Transmission Line and Beaver-Henrietta 138 kV Transmission Line to create the new Beaver-Wellington 138 kV Transmission Line.

1.2 Project Area Description

The Project area is located in southwest Lorain County, southwest of the Village of Wellington. According to the U.S. Census Bureau (USCB) 2018 official population estimates, Lorain County had approximately 390,461 people with the primary settlement areas in the northern area of county in the cities of Elyria, Amherst, North Ridgeville, Lorain, Avon, and Avon Lake. The northern area of the county is primarily urban and suburban, in contrast, the southern area of the county has a more rural setting, with fewer high- and medium- density development. The primary population centers in the southern area of the county include Oberlin, LaGrange, Rochester and Wellington. The primary transportation corridors through the southern portion of the county are U.S. Route 20, Ohio State Route 511 (SR-511), Ohio State Route 58 (SR-58), and Ohio State Route 18 (SR-18).

According to data from the USCB, Lorain County has sustained approximately 5 percent growth between the 2000 census and the 2018 population estimate, with population growing by 16,692 people between the 2000 and 2010 census (284,664 to 301,356) and 8,105 people between the 2010 census and the 2018 census estimate (301,356 to 309,461). Most of the population growth is in the Cleveland suburbs whereas population in the southern area of the county is relatively stable. The closest population center to the Project is the Village of Wellington which had a 2010 census population of 4,802 and a 2018 population estimate of 4,914 representing 2.3 percent growth over eight years.

ATSI is proposing to build the Project in the southwest part of Wellington Township to serve future growth in the area and to sustain service reliability. The Project area is generally west of SR-58 and south of SR-18. Existing land

[1] OAC §§ 4906-5-04

[2] A separate route selection study was prepared for the Brownhelm Section that addresses the routing analysis and recommendations for the approximately 1-mile transmission line.

uses surrounding the Project area consist primarily of low-density agricultural residential with higher-density residential and commercial/industrial within the Village of Wellington. Land uses gradually become more rural to the south and west of the Village of Wellington.

Physical attributes in the Project area include terrain that is relatively flat, with gently rolling hills near rivers and streams with elevation ranging from 800 to 930 feet above sea level. There are active agricultural fields and large woodlots throughout the Project area. A number of larger streams run through the area. Findley State Park, Wellington Reservation and Wellington Reservoir Park, known as the Wellington Reservoirs, are three large natural areas in the Project area.

Findley State Park is an 838-acre park that is heavily wooded with stately pines and various hardwoods and includes a 93-acre lake. The Wellington Reservation is made up of a 550-acre park that includes a 21-acre lake (known as the south reservoir) and Wellington Reservoir Park includes a 160-acre upground reservoir. These areas provide opportunities for hiking, biking, strolling, fishing, boating and wildlife observation within and just outside the Village of Wellington. No other major environmental features are in the Project area beyond would what be expected in this landscape.

2. Siting Study Process

2.1 Siting Process Overview

In compliance with the OPSB requirements, the Project siting team, which consists of a multi-disciplinary siting staff from ATSI, Burns & McDonnell, Inc., and Jacobs (as described in Appendix A), used a common siting methodology that is routinely utilized to site transmission projects in Ohio and other states. Although core siting processes and goals remain the same across all projects, there are unique elements to each project related to geography and setting, the type of project, the political and regulatory climate, and the project schedule. These unique elements influence the siting criteria and their relative weighting (or emphasis).

Transmission line projects can encounter a suite of competing technical, environmental, and land use criteria, requiring a comprehensive, relevant, and effective siting study design. That design should use appropriate data at the appropriate scale to focus quickly on those areas and corridors with the greatest potential for success. The siting process and methodology must also be transparent and effectively communicated.

The siting process provides a layered process employing appropriate methods for the siting team to determine the preferred and alternate routes for the Project. The process used for this Project consisted of the following primary task:

1. **Identifying a Project-specific study area:** The first step in the siting process was to develop a Project-specific study area that identifies an appropriate geographic boundary where the siting team can collect detailed constraint and opportunity data. The study area should include a large enough area to investigate reasonable routing alternatives for the Project. As part of the identification of a study area, the siting team reviewed publicly available environmental, land use, and socioeconomic information and determined the boundaries of the study area based on the initial opportunity (e.g., locations where a new transmission line may have least impacts) review and constraint (e.g., existing land or man-made features that are less suitable for a transmission line siting) review.

2. **Mapping of constraint and opportunity data:** After the siting team developed the study area, further constraint and opportunity data was collected under three broad headings; ecological, land use/cultural, and technical. Detailed data was collected under these broad headings based on their relevance to the Project, the study area, and the availability and quality of the dataset. Once collected, the data was analyzed by way of the following:

    a. The data was mapped within the study area to produce an overall constraint and opportunity map. This initial mapping gave the siting team insight into all the constraints located within the study area generally.

    b. After the data mapping was complete, the opportunity and constraint information was converted into raster-based (or grid cell) layers and assigned a suitability value related to its suitability to host a transmission line. For example, an existing utility right-of-way would be assigned a high suitability score, while a residential area or wooded wetland would be assigned a low score. These individual suitability layers were combined to form an overall suitability surface, which assists the siting team with developing a study segment network.

3. **Develop a study segment network and identification of alternative routes:** Once the suitability mapping and raster-based layers were completed, the information gleaned from the data analysis was used to develop a study segment network. Study segments were developed by using corridors that were the most conducive to electric transmission line development. Once the study segments were developed, each segment was scored based on the suitability model created under task 2 and reviewed to determine whether any segments should be removed based on more suitable segments.

The siting team then developed unique alternative routes for the Project by combining study segments. Before moving on to the next step in the siting process, all routes were reviewed, and minor adjustments made to confirm all routes proposed were feasible from a construction and operational standpoint.

4. **Comparing alternative routes:** Once the alternative routes were identified, and routing adjustments were incorporated, the siting team established a further set of metrics to compare and rank the alternative routes. These advanced metrics were based on opportunities and constraints identified within the study area and weighted based on the specific Project area setting and primary land uses, as well as the professional judgement of the siting team's experience routing projects in a similar setting.

   Based on quantitative scores and qualitative factors, the siting team identified two route alternatives to present at the public information meeting. As part of this process, the siting team chose routes that met the OPSB requirement that alternative routes submitted as part of the CECPN application have no more than 20 percent in common. [3]

5. **Official public information meeting:** The Project team held a public information meeting in the area in which the Project is located to present the Project, the two alternative routes and solicit written comments from the public to incorporate in the siting process. The initial public information meeting was supplemented in July and August of 2020 with an additional public engagement process.

6. **Route adjustments and re-evaluations**: The Project team made route adjustments based on applicable and relevant feedback from property owners at the initial public information meeting, the supplemental public engagement process, as well as detailed engineering and re-evaluated the two alternative routes. Because of the nature of the data collection and analysis process used in the review of siting options, the siting team was (and remains) able to reevaluate routes, corridors, and data with minimal additional processing of data inputs.

7. **Selection of a Preferred and Alternate route:** In addition to the quantitative evaluation, qualitative factors also play a crucial role in the selection of a Preferred Route and Alternate Route for the CEPCN application. The qualitative factors vary from project to project and could include visual impacts, local public perception and preferences, current land use, and proposed future land use. The siting team used their respective experiences to determine what, and how much qualitative data influenced routing decisions. Further record of qualitative information gleaned through the project is discussed in other sections of this document. Once the qualitative and quantitative analysis was considered, the siting team selected the Preferred and Alternate Routes presented in the Application.

2.2 Siting Study Timeline

The following provides a brief summation of the steps that the siting team followed through the route selection process:

- Field Review – October 9, 2019
- Study Segment Network Developed– November 4, 2019
- Identification of Alternative Routes – November 15, 2019
- Evaluation of Alternative Routes – November 27, 2019
- Siting Team Meeting: Decision on Alternative Routes– December 2, 2019
- Public Information Meeting – January 8, 2020
- Alternative Route Adjustments – Spring 2020
- Decision on Preferred and Alternate Route for OPSB Application – June 2020

[3] OAC § 4906-3-05

3. Detailed Siting Study Steps

3.1 Identifying a Project Specific Study Area

The study area's boundaries were determined by the geographic area encompassing the area between the Wellington Substation and the existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. The study area was defined to include a reasonable area where potential routes could be identified. Given these considerations, the siting team identified a study area encompassing approximately 7,533 acres (11.77 square miles) in Lorain County as shown on Figure 2.

The eastern boundary of the study area extends approximately 1.26 miles along Hawley Road between Cemetery Road and Findley State Park. The southern boundary parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line and runs north of Findley State Park for approximately 1.95 miles through agricultural and forested fields, then pivots to the south for approximately 1.5 miles, crossing Griggs Road, and then runs west for another 1.95 miles through agricultural and forested fields until it meets the western boundary. The western boundary extends approximately 4.2 miles along ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor, crossing Griggs Road, Jones Road, and Norwalk Road, until it meets the northern boundary in the middle of Echo Valley Golf Course. The northern boundary runs east for approximately 1.9 miles through forested and agricultural fields, then southeast for approximately 1.8 miles, cutting through the Village of Wellington on the east side of the Wheeling & Lake Erie Railway Company railroad, then runs east for approximately 1.2 miles along Cemetery Road where it meets the eastern boundary.

The siting team believed that extending the study area past these boundaries would add unnecessary area without significant benefit. The northern boundary allows the siting team to evaluate potentially paralleling the Wheeling & Lake Erie Railway Company railroad while limiting impacts to dense residential areas associated with the Village of Wellington. The southern boundary avoids crossing Findley State Park while still capturing opportunities to parallel existing linear infrastructure. Extending the study area east or west of the identified boundaries would have added unnecessary length to the Project.

3.2 Mapping of Constraint and Opportunity Data

Once the study area was determined, Jacobs reviewed publicly available data specific to the study area to identify opportunities and constraints that could affect the viability of a proposed transmission line route. Typical constraints evaluated included the following:

- **Environmental constraints:** wetlands, waterbodies, floodplains, and records of the presence of threatened and endangered species.
- **Cultural resources constraints:** resources listed on the National Register of Historic Places and historic districts, state-listed historical resources, architectural resources, and known archaeology sites.
- **Land use constraints:** existing residential, commercial and industrial uses, federal, state, or local lands, railroads, interstate highways, potential right-of-way encroachments, and potential for future land uses.

The sections below summarize the information identified within the study area. Appendix B presents a list of the geographic information system (GIS) data sources used for this study. GIS data sources vary with respect to accuracy and precision. For this reason, GIS-based calculations and maps presented throughout this study should be considered reasonable approximations of the resource or geographic feature they represent and should not be considered absolute measurements or counts.

3.2.1 Constraints and Opportunity Data

Environmental Resources

Environmental resource data was reviewed before the siting of electric transmission lines so that environmental constraints could be identified, and routing corridors could be developed to avoid and/or minimize potential impacts on environmental resources. Environmental data and information collected within the study area was used to examine different aspects of the project in ways that were environmentally and economically prudent.

Environmental resources can present constraints to routing electric transmission lines. Large water features, such as lakes, wetlands, or floodplains, can present routing constraints that limit the siting team's ability to develop study segments and routing alternatives in certain areas. The siting team used the environmental data to develop study segments and routing alternatives that avoid these features to the extent practicable. The following environmental resources were reviewed within the study area as resources that could present routing constraints.

Wetlands

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) was reviewed to identify the abundance, characteristics, and distribution of wetlands within the study area. Based on the data, there are a greater quantity and larger surface area of forested and shrub wetlands compared to that of emergent wetlands. Most of the wetlands are located along the named streams within the study area. A series of small forested wetlands are mapped in the northern part of the study area along West Branch Black River. An approximately 32-acre forested wetland is mapped along Charlemont Creek in the middle/southern part of the study area. A series of large emergent wetlands are mapped along a tributary that flows to Wellington Creek in the eastern part of the study area. Table 3-1 summarizes the extent of wetland features identified within the study area and Figure 3 shows NWI feature locations. No wetlands of state/national significance are located within the study area.

Table 3-1. Wetland Resources within the Study Area

Wetland Type	NWI Codes	Number of Features	Area (acres)
Freshwater Emergent Wetland	PEM1A, PEM1C	13	35.9
Freshwater Forested/Shrub Wetland	PFO1/SS1C, PFO1A, PFO1C, PSS1/EM1C, PSS1C	38	126.9
Total		**51**	**162.8**

Source: USFWS 2019

Wetland crossings are commonplace for overhead electric transmission facilities and may occur within a route corridor. Wetland permitting would be required before installing temporary access roads, temporary work pads, and/or temporary pulling pads. ATSI would look to avoid placing permanent structures within wetlands where possible. Based on the location and size of wetlands within the study area, wetlands were considered a constraint to siting a transmission line in the study area.

Waterbodies

U.S. Geological Survey (USGS) topographical maps and National Hydrography Dataset (NHD) were reviewed to identify major perennial and intermittent streams within the study area that could potentially impact feasibility of a transmission line because of required span length (distance between two transmission structures) needed to cross the waterbody or waterbody crossings require additional permitting/coordination with federal and state agencies. Three named streams and their associated unnamed tributaries run through the study area; Charlemont Creek, Wellington Creek, and West Branch Black River. None of the streams within the study area qualify as a Section 10 waterway as designated by the U.S. Army Corps of Engineers.

Two lakes associated with the Wellington Reservoirs and several small unnamed lakes and ponds are located within the study area. Smaller unnamed lakes and ponds are scattered throughout the study area and are located primarily within forested areas and on the edge of residential properties. The upground reservoir is located south of the county fairgrounds and east of Pitts Road. The southern reservoir lake is located south of Jones Road directly south of the upground reservoir. Figure 3 shows waterbody locations within the study area.

Like wetlands, stream crossings are commonplace for overhead electric transmission facilities and may occur within a route corridor. Based on the location of the streams within the study area, a stream crossing would likely occur within a route corridor, though the span length would not impact feasibility of the transmission line; therefore, streams were considered a minor constraint to siting a transmission line within the study area.

Lake crossing are not commonplace for overhead electric transmission facilities due to the distance required to span these features. The size and location of the Wellington Reservoirs and associated lakes were considered major constraints to siting a transmission line in the study area.

Floodplains

Federal Emergency Management Agency (FEMA) floodplain maps were reviewed to identify floodplains within the study area. Based on the information gathered from FEMA, floodplains occur along Charlemont Creek, Wellington Creek, West Branch Black River and several tributaries that flow into those streams throughout the study area (Figure 3). The floodplain surrounding West Branch Black River on the northern side of the study area appears to be the widest floodplain at approximately 1,350 feet.

The floodplains within the study area are associated with the listed streams; therefore, a floodplain crossing would likely occur within a route corridor. FEMA floodplain permitting would be required before installing temporary access roads, temporary work pads, and/or temporary pulling pads and ATSI would look to avoid placing permanent structures within the floodplain where possible. Based on the width of the floodplains and ATSI's ability to avoid work within the floodplain, floodplains in conjunction with stream crossings were considered a constraint on the Project.

Threatened and Endangered Species

USFWS Information for Planning and Conservation (IPaC) and Ohio Department of Natural Resources (ODNR) State Listed Wildlife Species was reviewed to determine federally and state-listed endangered, threatened, rare, special concern, and species of concern that have the potential to occur within the study area. Based on these reports, the Indiana bat, northern long-eared bat, sandhill crane, northern harrier, and upland sandpiper have potential to occur within the study area (Appendix C). No areas of high-quality habitat were identified within the study area.

At this stage in the Project, the available data on threatened and endangered species does not limit the opportunities for siting potential routes within the study area and therefore were not considered a constraint on the Project. Jacobs understands that project activities will likely be planned such that potentially suitable habitat areas will be avoided entirely or staged such that effects to federally and state-listed species are unlikely or completely avoided.

Cultural Resources

Cultural resources data was reviewed to identify and examine the locations and types of previously recorded cultural resources within the study area. Cultural resources can present a major constraint for transmission line routing where there are resources of exceptional significance, groupings of resources, or large districts that may deter transmission line corridors from crossing specific sections of a study area. Analyzing and mapping cultural resources enables the siting team to develop study segments and routing alternatives that avoid, minimize, or mitigate impacts to known cultural resources within the study area.

Jacobs conducted background research using the Ohio Historic Preservation Office (OHPO) online mapping database in September 2019, to locate previously recorded cultural resources and surveys within the study area. This investigation revealed no Ohio Archaeological Inventory (OAI)-listed archaeology sites, five Ohio Historic Inventory (OHI)-listed architectural and historical resources, three individual National Register of Historic Places (NRHP)-listed resources, one NRHP-listed Multiple Resource Area (MRA), and one historic district within the study area. The architectural and historical resources within the study area are shown on Figure 4.

Archaeological Sites & Architectural and Historical Resources

The five OHI-listed resources located within the study area include four single dwellings and one former hotel/inn. Three of these resources are listed on the NRHP (as components of an MRA) and are detailed in Table 3-2, including: The Gunn House (LOR0135223), the Sprague House (LOR0180223), and the Mosher House (LOR0180323). The fourth OHI-listed resource is the Sherman-Ray House (LOR0131523), which is not eligible for NRHP listing. Finally, the Jud Wadsworth House (LOR0179923) is eligible for individual listing on the NRHP and is within the NRHP-listed Wellington Historic District.

National Register of Historic Places

Surveyed cultural resources are evaluated for potential significance according to the NRHP Criteria for Evaluation, which are used as the basis for evaluating significance for state-funded or –permitted projects in Ohio. The presence of NRHP-listed or –eligible cultural resources could be a constraint to a study segment or route alternative, as adverse impacts would require mitigation, in consultation with the OHPO, Native American tribes, and/or other local historical organizations.

Three individual NRHP-listed resources, one MRA, and one historic district are located within the study area. One NRHP-eligible resource, the Jud Wadsworth House (LOR0179923), is within the Wellington Historic District which is located in the northeastern area of the study area within the Village of Wellington. The NRHP-listed resources are detailed in Table 3-2. The three individually NRHP-listed resources are residences located along South Main Street/ South Ashland-Oberlin Road (SR 58): the Sprague House, the Mosher House, and the Gunn House all within the Village of Wellington. All three resources are listed under Criterion C, for their architectural significance.

The Wellington-Huntington Road MRA is a non-contiguous resource area on South Main Street/South Ashland-Oberlin Road, and Clark Road at New London-Lafayette Road. The Wellington-Huntington Road MRA includes 22 resources, with the three aforementioned individual properties being the only contributing resources within the study area. The MRA is listed under Criterion C as a collection of architecturally significant resources.

The NRHP-listed Wellington Historic District is located along South Main Street, includes a total of 80 resources, and completely envelops the smaller Wellington Center Historic District. Only the southern end of the historic district is located within the study area. The historic district is listed on the NRHP under Criterion A, for its association with events that have made a significant contribution to the broad patterns of our history; and under Criterion C for its collection of significant architecture.

Table 3-2. NRHP-Listed and Architectural and Historical Resources in Study Area

Number	Resource Name	Location	Date	NRHP Criteria
NR79003894	Sprague House	24060 SR 58 Wellington	1830	Criterion C
NR79003887	Mosher House	23467 SR 58, Wellington	1903	Criterion C
NR79003883	Gunn House	24350 SR 58, Wellington	1840	Criterion C
NR64000656	Wellington-Huntington Road MRA	Non-contiguous resource area S Ashland-Oberlain Road and Clark Road at New London-Lafayette Road	1800-1900	Criterion C
NR79001891	Wellington Historic District (includes Jud Wadsworth House)	Irregular boundary along Main Street, From Kelly Street to W and L E RR, Wellington	1800-1900	Criteria A and C

Source: National Register of Historic Places Database and Ohio Historic Preservation Office

Jacobs' research of the NRHP-listed resources revealed that they are located along South Main Street/South Ashland-Oberlin Road (SR 58) within the study area. At this phase of the routing process, Jacobs' siting team determined that these resources pose a risk to developing electric transmission line corridors because the transmission line needs to cross this road in order to span from the Wellington Substation to the existing Brookside-Henrietta 138 kV transmission corridor. These resources were therefore considered a siting constraint for routing of the transmission line.

Land Use

Land use impacts include direct and indirect impacts to residential, commercial, recreational, industrial development, and institutional uses (e.g., schools, places of worship, cemeteries, and hospitals) and can limit the potential for a transmission line corridor to be constructed in highly developed areas. As part of this siting study, Jacobs analyzed existing land use features within the study area and whether these existing land uses provide opportunities or constraints to route an electric transmission line within the study area.

The built environment in the study area includes areas of low-density residential areas along county roads, higher-density residential areas associated with the Village of Wellington, and commercial and industrial buildings on the outer edge of the Village of Wellington. Most of the study area is contiguous open lands (agricultural and forested) which are more conducive to routing transmission lines.

Residential, Commercial, Institutional, and Industrial Development

Low-density agricultural residential and higher-density residential are the primary land uses within the study area. Low-density agricultural residential include residences on large agricultural parcels and can be found throughout most of the study area, with residences along Griggs Road, Jones Road, Norwalk Road, Quarry Road, Pitts Road and Hawley Road. Higher-density residential includes single-family residences on smaller parcels within community developments and is found along the northeast edge of the study area within the Village of Wellington.

Commercial and industrial uses are primarily located along the northeast edge of the study area along South Main Street, Norwalk Road, and adjacent to the railway tracks within the Village of Wellington. No institutional uses (e.g. schools) are located within the study area. Residential, commercial and industrial development in the study area were considered a moderate constraint.

Recreation Areas

Numerous recreational areas are located within the study area. The most prominent and largest recreation area is the Wellington Reservation located in the middle of the study area, southwest of the Village of Wellington. This 550-acre park was developed in 2005 and includes a 21-acre lake (known as the southern reservoir), grassland fields, forests, and wetland, providing opportunities for hiking, biking, strolling, fishing, boating and wildlife observation. This area was considered a major constraint within the study area and the siting team sought to avoid this area with study segments and alternative routes.

Wellington Reservoir Park includes the 160-acre Wellington Upground Reservoir and is located north of Jones Road and the Wellington Reservoir. The reservoir provides opportunities for fishing, boating powered by sail, paddle, oars, or electric motor, and wildlife observation. The reservoir itself was considered a major constraint within the study area and the siting team developed study segments and alternative routes that avoided the reservoir.

The Lorain County Fairground is located along the northern edge of the study area, south of SR-18 and east of Pitts Road. The fairground includes a large racetrack and grandstand, several horse-riding rings, a Ferris wheel, numerous halls and buildings, camp ground, parking, showers and restrooms, and food and drink services. The fairground hosts a number of events throughout the year including wedding receptions, graduation parties, conventions, auctions, and more. The largest event is the Lorain County Fair, Ohio’s second largest county fair, which is held in the middle of August each year and attracts approximately 125,000 people. Due to the high number of people that visit the fairgrounds and numerous events held throughout the year, this area was considered a constraint within the study area.

Wellington Community Park is located along the northeast boundary of the study area, north of Norwalk Road within the Village of Wellington. This park includes lighted ball diamonds, batting cages, basketball and tennis courts, horseshoe pits, soccer fields, sand volleyball court, picnic pavilions, a two-mile wooded boardwalk, and a number of playground areas. Echo Valley 18-hole public golf course is located in the northeast corner of the study area. Based on the location of these recreational areas within the study area, these areas were considered a minor constraint on the Project.

The abundance and size of recreational features within the study area presented a unique constraint as the fairgrounds, Wellington Reservoir Park and Wellington Reservation are located in a line, north to south, across the study area, thereby creating few viable east to west corridors for siting a proposed transmission line route.

Transportation and Utilities (Major Roads, Railroads, Airports, and Transmission Corridors)

The study area is crossed by state routes, county roads and local streets. The primary roadway in the study area is Norwalk Road (SR-18), which runs east to west across the northern half of the study area, and South Ashland-Oberlin Road (SR-58), which runs north to south across the eastern half of the study area. SR-18 connects the Village of Wellington to Medina to the east. SR-58 connects the Village of Wellington to the northern part of the county. SR-58 is an important state highway in Lorain county, as it connects the population centers of Lorain and Elyria in the northern part of the county with the villages and towns located in the rural southern area of the county.

Other important roads in the study area include Hawley Road which runs north to south on the east side of the study area, Pitts Road which runs north to south on the west site of the Village of Wellington, Quarry Road which runs north to south across the west side of the study area, Jones Road which runs east to west across the middle of the study area, and Griggs Road which runs east to west across the southern part of the study area. These secondary roads connect with the larger arterials in the area and serve the residential areas in the study area. The primary and secondary roads serve the majority of the development in the study area, with residences and commercial/industrial buildings located on either side of the road.

The roadways identified within the study area were considered a moderate constraint to routing a transmission line because most of the residential and commercial uses are located alongside these corridors. The secondary roads are generally not as developed as the primary roads with residences spaced further apart and residences set back from the road right-of-way. Secondary roads were considered an opportunity to routing a transmission line because they present opportunities for paralleling areas with existing linear disturbance thereby minimizing impacts to natural resources and land use. The siting team sought to develop study segments that avoided the state routes and primary roads with concentrations of land uses in favor of using routing opportunities along secondary roads with fewer land uses to the extent practicable.

Three railroads are located within the study area. CSX Transportation maintains a railroad that runs southwest to northeast across the middle of the study area, Lorain and West Virginia Railroad runs north to south in the northern part of the study area, and Wheeling & Lake Erie Railway Company runs east to west along the northern edge of the study area. These railroads presented routing opportunities for transmission line corridors within the study area.

No airports are located within the study area. The closest airport is Lorain County Regional Airport located approximately 12 miles north of the study area's eastern boundary. This airport is noted in this study; however, it is not located in the study area, and therefore does not present a risk to the routing of potential transmission line corridors within the study area.

Five 69 kV to 138 kV electric transmission lines owned by ATSI are located within the study area. Most of these lines run along the perimeter of the study area except for the Brookside-Wellington 138 kV Transmission Line which cuts across the middle of the study area:

- Brookside-Henrietta 138 kV
- Brookside-Wellington 138 kV
- Carlisle-Wellington 69 kV
- Hanville-Wellington 69 kV
- Homer-Wellington 69 kV

Existing transmission line corridors, especially those owned and operated by ATSI, were considered an opportunity because they present opportunities for co-locating the proposed 138 kV transmission line within or adjacent to an existing transmission line corridor, potentially minimizing impacts to natural resources and land use.

3.2.2 Field Review

A field review of the site is an important way for the siting team to glean information about the opportunities and constraints identified during the routing development phase of the Project. Members of the siting team conducted a field review on October 9, 2019. Before the site visit, the siting team determined locations within the study area that the team would visit, photograph, and document opportunities and constraints. All these locations were located within public rights-of-way. Right-of-entry was not requested from property owners due to the preliminary nature of the research.

The following describes what the siting team observed within the Project study area. Figure 5 shows the locations visited by the siting team. Appendix D includes photographs taken at each of the field review locations.

- **Location #1:** Wellington Substation. The Wellington Substation is located on the west side of Hawley Road just north of the intersection with Jones Road. As shown in the photograph, the area surrounding the substation to the west and south is active agricultural farmland. To the north of the substation, there are single-family homes located along the west side of Hawley Road. The siting team did not observe any constraints that would prohibit the expansion of the substation.

- **Location #2:** Existing Brookside-Wellington 138 kV Transmission Line corridor crossing South Main Street. The existing right-of-way crosses South Main Street at this location. To the south, east, and west, there are active agricultural fields. North of the transmission line crossing there are commercial uses including a Dollar General. The parcel that the transmission line is located on is currently for sale for commercial use. The siting team did not observe any existing development that would limit transmission line routing in this area.

- **Location #3:** Existing Brookside-Wellington 138 kV Transmission Line corridor crossing Parkside Street. The existing transmission line crosses Parkside Drive in a medium/high density residential area. The siting team observed habitable primary structures located adjacent to the transmission line right-of-way on both sides. The existing development constrains potential routing opportunities in this area, confining potential study segments to be located within ATSI's existing right-of-way.

- **Location #4:** Existing Brookside-Wellington 138 kV Transmission Line at Wellington Upper Reservoir. The existing 138 kV transmission line runs adjacent to the reservoir at this photo location. The reservoir is located on the north side of the exiting line, forested areas are located to the south. The reservoir presents a major constraint in this area, limiting potential routing corridors to the south of the reservoir.

3.2.3 Raster-Based Suitability Modeling

Constraint and opportunity data gathered in Section 3.2.1 were scored by the siting team, based on relative importance, then in conjunction with the National Land Cover Data set (2013-2016), used to create a raster-based suitability surface in the form of a grid over the study area. The purpose of this suitability surface was to aid in identifying potential route corridors within the study area. The suitability model analysis resulted in three levels of detail, or tiers of suitability surfaces:

- **Tier 1:** Individual criteria or layers (for example, woodlots, wetlands, soils, and threatened and endangered species were collected and mapped individually). Each data layer was converted to raster format where each grid cell measured 100 feet by 100 feet and was assigned a "suitability" score between 1 and 10, where 1 is "best" and 10 is "worst." The scores were determined by the Project team using professional experience with similar projects and regulatory guidelines.

- **Tier 2:** Related Tier 1 surfaces were combined into one of three categories (technical, ecological, and land use/cultural) and given a category score. For example, woodlands, wetlands, endangered species and protected areas were combined to form an "ecological" suitability surface. In addition to serving as the foundational pieces of the suitability model, these grouped layers are useful in communicating the siting process to interested parties.

- **Tier 3:** Tier 3 surfaces were generated by combining and applying statistical weights to the three Tier 2 surfaces. The result was an overall suitability surface model which is color-coded using a progressive chromatic scale from red (least suitable) to green (most suitable).

The overall suitability model (Figure 6) includes a color-coded display that allows for an easy visual assessment of routing constraints and opportunities. Additionally, geospatial algorithms can be applied to determine the suitability of potential study segments and corridors.

This model allows for an accurate and reproducible assessment of the data because it employs mathematical principles to arrive at a scientifically-sound conclusion, with minimal impact from human error and bias. The purpose of creating the suitability model for this Project was to clearly identify areas that would be the most suitable for developing a routing corridor network. The suitability model also shows areas where routing constraints would limit the development of routing corridors.

3.3 Develop a Study Segment Network and Identification of Alternative Routes

Developing routes is an iterative process that allows for re-assessment and adjustment of routes to be made throughout the process as a result of the identification of new constraints. As a result of the evolving nature of the route development process, the siting team used specific vocabulary to describe the routes at different stages of route development.

Initial route development efforts start with identification of constraints and opportunities within the study area, as discussed in Section 3.2. Based on the raster-based suitability model developed, the siting team first develops an array of conceptual routes for the Project utilizing areas of the suitability model that highlight areas that are favorable to siting a transmission line and avoiding areas that are less favorable. Where two or more of these conceptual routes intersect, study segments are formed between points of intersection. Together, the assemblage of study segments and their intersecting points are referred to as the Study Segment Network.

As the route development process progresses, the siting team continued to evaluate new data and modify, if necessary, the study segments included in the network to develop a Refined Study Segment Network. Eventually, formal Alternative Routes are developed by assembling the study segments in all possible arrangements that connect the start and end points of the Project.

3.3.1 Developing a Study Segment Network

Using the overall suitability model and review of aerial photography, topographic maps, and the collected attribute and constraint data, Jacobs developed conceptual routes. The intent when developing the conceptual routes was to avoid less suitable areas (i.e., urban areas, wetlands, forested areas) and follow more suitable areas (i.e., existing developed corridors such as roads and existing transmission/distribution lines). Based on the siting process, the Project started with 28 study segments. The initial study segments developed for the Project are described below and shown on Figure 7a-7b.

Study Segment 1 is in the middle of the study area and runs for 1.56 miles between Pitts Road and ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line. This study segment parallels ATSI's existing Brookside-Wellington 138 kV Transmission Line within ATSI's existing right-of-way.

Study Segment 2 is in the northwest corner of the study area. This study segment runs northwest to southeast for approximately 0.58 mile, connecting with ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This study segment crosses agricultural fields and Quarry Road.

Study Segment 3 is in the northwest corner of the study area. This study segment runs east to west for approximately 0.54 mile through open fields and crosses Quarry Road. This study segment connects with the east end of study segment 2 and ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor.

Study Segment 4 is in the northwest corner of the study area and runs northwest to southeast for approximately 0.32 mile through agricultural fields and forested areas. This study segment connects study segments 5 and 6 to study segments 2 and 3.

Study Segment 5 is in the northwest corner of the study area and travels east to west for approximately 0.76 mile across agricultural fields between ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor and the southern end of Study Segment 4.

Study Segment 6 is in the northwest corner of the study area and runs northwest to southeast for approximately 0.19 mile through agricultural fields between the intersection of study segment 4 and 5 and Norwalk Road.

Study Segment 7 runs north to south for 0.1 mile through an agricultural field between the south side of Norwalk Road and the Wheeling & Lake Erie Railway Company railroad.

Study Segment 8 parallels Norwalk Road east to west for approximately 0.61 mile and travels north to south for approximately 0.1 mile, crossing over the Wheeling & Lake Erie Railway Company railroad.

Study Segment 9 is in the northwest corner of the study area. This study segment runs east for approximately 0.90 mile between ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor and the southern end of Study Segment 7. This study segment parallels the Wheeling & Lake Erie Railway Company railroad.

Study Segment 10 runs east to west for approximately 0.61 mile, paralleling the Wheeling & Lake Erie Railway Company railroad between the southern ends of study segments 7 and 8.

Study Segment 11 travels east to west for approximately 0.06 mile, beginning at the southern end of Study Segment 8, paralleling the Wheeling & Lake Erie Railway Company railroad south of Norwalk Road and west of Pitts Road, and located between study segments 10, 12 and 13.

Study Segment 12 runs east to west then northwest to southeast for approximately 1.52 miles between Pitts Road and east of Prospect Street. This study segment parallels the Wheeling & Lake Erie Railway Company railroad through the Village of Wellington.

Study Segment 13 travels north to south for approximately 0.92 mile along the west side of Pitts Road between the Wheeling & Lake Erie Railway Company railroad and ATSI's existing Brookside-Wellington 138 kV Transmission Line. This study segments connects to study segments 11, 12, 1 and 16.

Study Segment 14 is located along the northern and eastern boundary of the study area and runs east to west along Cemetery Road for approximately 1.35 miles and north to south along Hawley Road for approximately 0.71 mile, stopping at the Wellington Substation. This study segment connects with the Wellington Substation and study segments 12 and 15.

Study Segment 15 runs northwest to southeast for approximately 0.61 mile along the Wheeling & Lake Erie Railway Company railroad between east of Prospect Street and ATSI's existing Brookside-Wellington 138 kV Transmission Line. This study segment connects to study segments 12, 14, 17, and 19.

Study Segment 16 runs northwest to southeast for approximately 0.72 mile between Pitts Road and the parking lot for Wellington Reservoir Park in the middle of the study area. This study segment connects with study segments 17, 18, 13, and 1, and parallels ATSI's existing Brookside-Wellington 138 kV Transmission Line within ATSI's existing right-of-way directly south of the Wellington Reservoir.

Study Segment 17 travels east to west for approximately 0.98 mile between the parking lot for Wellington Reservoir Park and the Wheeling & Lake Erie Railway Company railroad. This study segment parallels ATSI's existing Brookside-Wellington 138 kV Transmission Line within ATSI's existing right-of-way and cuts between the neighborhoods along Parkside Street. This study segment connects study segments 15, 19, 16, and 18.

Study Segment 18 runs north to south for approximately 0.3 mile between the parking lot for Wellington Reservoir Park and Jones Road. This study segment parallels the access road to Wellington Reservoir Park and connects to study segments 16, 17, 20 and 21.

Study Segment 19 travels northwest to southeast for approximately 0.47 mile, paralleling the Wheeling & Lake Erie Railway Company railroad between Study Segment 17 and Jones Road and connecting study segments 15, 17, 22, and 23.

Study Segment 20 runs east to west for approximately 2.28 miles along Jones Road between ATSI's north-south Brookside-Henrietta 138 kV Transmission Line corridor and the access road to Wellington Reservoir Park. This study segment connects to study segments 18 and 21.

Study Segment 21 travels east to west for approximately 0.06 mile along Jones Road east of the access road to Wellington Reservoir Park. This short study segment connects study segments 18 and 20 to study segments 22 and 24.

Study Segment 22 runs east to west for approximately 1.32 miles along Jones Road between the access road to Wellington Reservoir Park and the Wheeling & Lake Erie Railway Company railroad. This study segment connects to study segments 19, 23, 21, and 24.

Study Segment 23 travels east to west for approximately 0.46 mile through an agricultural field and crosses over the Wheeling & Lake Erie Railway Company railroad. This study segments parallels ATSI's existing Brookside-Wellington 138 kV Transmission Line within ATSI's existing right-of-way and ends at the Wellington Substation. This study segment connects the Wellington Substation to study segments 19 and 22.

Study Segment 24 runs north to south for approximately 0.57 mile along the east side of the Wellington Reservoir through an agricultural field and forested area. This study segment connects study segments 21, 22, 25, and 26.

Study Segment 25 travels along the eastern and southern boundary of the study area. This study segment runs north to south for approximately 0.55 mile along Hawley Road then runs east to west for approximately 1.94 miles north of Findley State Park. This study segment parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line and connects the Wellington Substation to study segments 24 and 26.

Study Segment 26 runs north to south for approximately 0.81 mile through forested and agricultural fields along the southeastern boundary of the study area. This study segment parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line and connects to study segments 24, 25, 27 and 28.

Study Segment 27 travels east to west for approximately 2.04 miles between ATSI's north-south Brookside-Henrietta 138 kV Transmission Line corridor and ATSI's Hanville-Wellington 69 kV Transmission Line. This study segment parallels Griggs Road and connects to study segments 26 and 28.

Study Segment 28 runs north to south then east to west for approximately 2.56 miles between ATSI's north-south Brookside-Henrietta 138 kV Transmission Line corridor and just east of Clark Road. This study segment runs along the southern boundary of the study area through agricultural and forested fields, parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line and connects to study segments 26 and 27.

3.3.2 Study Segment Evaluation and Refining the Study Segment Network

Once the initial study segments were developed, geospatial algorithms were applied to determine the suitability scores of each study segment (see Table 3-3). Suitability scores were calculated for each of the three categories (ecological, land use/cultural, and technical) as well as an overall suitability score which took into account the aforementioned categories collectively to assist the siting team in comparing similar study segments. By reviewing and comparing the suitability scores, the siting team was able to remove study segments that were less suitable (poor scoring), creating a Refined Study Segment Network, and advancing the better scoring study segments onto the next stage in the route development process, resulting in more refined, optimal routes. As a verification check, the siting team also reviewed the study segment constraint data and maps prior to removing study segments to confirm that the numerical scoring results were reasonable and realistic based on professional judgement.

Table 3-3. Wellington Section Study Segment Suitability Scoring

Study Segment	Length (miles)	Ecological Suitability Score	Land Use Suitability Score	Technical Suitability Score	Overall Suitability Score	Notes
1	1.56	3.52	1.89	3.13	2.67	Retained
2	0.58	2.94	2.24	6.57	3.66	Removed
3	0.54	3.07	2.43	6.52	3.89	Removed
4	0.32	2.26	1.75	7.00	3.68	Removed
5	0.76	1.97	2.18	6.49	3.59	Retained
6	0.19	3.56	2.82	6.80	4.22	Retained
7	0.10	1.60	2.40	6.80	3.60	Retained
8	0.71	3.16	4.21	7.18	4.62	Removed
9	0.90	2.17	2.42	6.35	3.34	Retained
10	0.61	2.71	2.45	6.94	3.81	Retained
11	0.06	1.00	2.00	8.00	3.67	Retained
12	1.52	2.78	4.15	5.15	3.99	Retained
13	0.92	1.79	2.55	6.25	3.51	Retained
14	2.06	3.90	3.78	3.15	3.65	Retained
15	0.61	2.44	3.94	5.23	3.66	Retained
16	0.72	3.49	1.78	2.95	2.49	Retained
17	0.98	2.69	3.56	3.00	2.96	Retained
18	0.30	3.31	2.50	5.81	3.50	Retained
19	0.47	3.07	1.65	3.00	2.44	Retained
20	2.28	3.50	3.18	5.93	4.03	Removed
21	0.06	1.67	3.00	7.00	4.00	Retained
22	1.32	2.84	3.52	5.62	3.70	Retained
23	0.46	1.50	1.83	2.96	2.13	Retained
24	0.57	3.50	2.03	6.50	3.90	Removed
25	2.49	2.35	1.56	3.16	2.39	Retained
26	0.81	4.50	1.60	4.00	3.07	Retained
27	2.04	2.94	3.07	5.89	3.98	Retained
28	2.56	3.47	1.72	3.61	2.82	Retained

In the northern part of the study area, three combinations of four study segments connect with the existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. Study segments 4 and 2, study segments 4 and 3, and study segment 5 were compared against each other. Of the four study segments, study segments 2, 3, and 4 had higher overall suitability scores (meaning they are less suitable) than Study Segment 5. Therefore, study segments 2, 3, and 4 were removed from consideration.

Study segments 10 and 7 and Study Segment 8 both connect Study Segment 11 with Study Segment 7. These study segments were compared and Study Segment 8 had a higher overall suitability score than study segments 10 and 7. Therefore, Study Segment 8 was also removed from consideration.

In the middle of the study area, study segments 16 and 1 and Study Segment 20 both connect with the existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. Study Segment 20 had a much higher suitability score than study segments 16 and 1, therefore, Study Segment 20 was removed from consideration.

Study segment combination 23-22-24 and Study Segment 25 both connect to Study Segment 26 near the southern part of the study area. These study segments were compared and Study Segment 25 had a lower overall suitability score than study segments 22 and 24. Although Study Segment 22 scored higher, it is needed to connect to Study Segment 21 and therefore was retained. Study Segment 24 does not connect to any other study segments and was removed from consideration.

Before moving on to the next step in the route development process, all study segments were reviewed, and minor adjustments were made along the following segments to confirm all routes proposed were feasible from a construction and operational standpoint.

- **Study Segment 7 –** Shifted approximately 40 feet east to run closer to edge of agricultural field so that ATSI's right-of-way doesn't occupy more land than is necessary on an active agricultural field.
- **Study Segment 18 –** Shifted approximately 17 feet east to run parallel to the access road to Wellington Reservoir. This study segment previously ran over top of road.
- **Study Segment 25 –** Shifted away from ATSI's Hanville-Wellington 69 kV Transmission Line right-of-way. Shifting the alignment ensures the right-of way for the proposed 138 kV transmission line does not overlap with the existing right-of-way for the 69 kV transmission line.
- **Study Segment 26 –** Shifted away from ATSI's Hanville-Wellington 69 kV Transmission Line right-of-way. Shifting the alignment ensures the right-of way for the proposed 138 kV transmission line does not overlap with the existing right-of-way for the 69 kV transmission line.
- **Study Segment 27 –** Shifted south away from Griggs Road and moved a section of the study segment to the north side of the road to avoid a residence within ATSI's proposed right-of-way.
- **Study Segment 28 –** Shifted away from ATSI's Hanville-Wellington 69 kV Transmission Line right-of-way. Shifting the alignment ensures the right-of way for the proposed 138 kV transmission line does not overlap with the existing right-of-way for the 69 kV transmission line.

Analyzing the study segment network allowed the siting team to get a comprehensive look at the viability of segments considered for the Project. By making the adjustments to existing study segments and removing those that were not considered as viable for the reasons described, the siting team was able to narrow the scope of their investigation to those sections providing the most viable options to create alternative routes.

3.3.3 Developing Alternative Routes

Using the Refined Study Segment Network, the siting team compiled the remaining and refined study segments into ten alternative routes (see Table 3-4) for analysis and comparison. The alternative routes described in Table 3-4 represented the most logical, unique combinations of study segments developed for the Project. The alternative routes are shown on Figure 7b.

Table 3-4. Wellington Section Alternative Routes

Alternative Route	Study Segments	Length (miles)
1	25-26-28	5.86
2	25-26-27	5.35
3	23-22-21-18-16-1	4.41
4	23-19-17-16-1	4.19
5	23-19-17-16-13-11-10-9	5.12
6	23-19-17-16-13-11-10-7-6-5	5.27
7	23-19-15-12-11-10-9	4.63
8	23-19-15-12-11-10-7-6-5	4.78
9	14-12-11-10-9	5.14
10	14-12-11-10-7-6-5	5.29

Alternative Route 1 is approximately 5.86 miles long and is the longest alternative route. From the Wellington Substation, the route runs south for approximately 0.55 mile along Hawley Road, then west for approximately 1.94 miles, then southwest for approximately 1.45 miles, then west for approximately 1.92 miles connecting to ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route uses open agricultural fields, avoids residential structures and parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line but runs close to Findley State Park and the Wellington Reservoir.

Alternative Route 2 is approximately 5.35 miles long. From the Wellington Substation, the route runs south for approximately 0.55 mile along Hawley Road, then west for approximately 1.94 miles, then southwest for approximately 0.82 mile, then west for approximately 2.04 miles along Griggs Road and connecting to ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route uses open agricultural fields, parallels existing linear disturbance and parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line but it also runs close to Findlay State Park and the Wellington Reservoir.

Alternative Route 3 is approximately 4.41 miles long. From the Wellington Substation, the alternative route runs west along Jones Road for approximately 1.84 miles, then runs north along the access road to the Wellington Upground Reservoir for approximately 0.30 mile. The alternative route then runs northwest for approximately 2.27 miles, paralleling ATSI's Brookside-Wellington 138 kV Transmission Line within ATSI's existing right-of-way and ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route runs south of the Village of Wellington's medium density residential area but runs close to the Wellington Reservoir.

Alternative Route 4 is approximately 4.19 miles long and is the shortest route alternative. From the Wellington Substation, the alternative route runs west for approximately 0.46 mile north of Jones Road, then runs northwest for approximately 0.47 mile along the Wheeling & Lake Erie Railway Company railroad, then west for approximately 0.98 mile across agricultural field and between two residential communities, before running northwest for approximately 2.28 miles and ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route parallels ATSI's Brookside-Wellington 138 kV Transmission Line and is located within ATSI's existing right-of-way the entire length of the alternative route but does cut through a medium density residential area within the Village of Wellington.

Alternative Route 5 is approximately 5.12 miles long. From the Wellington Substation, the alternative route runs west for approximately 0.46 mile, north of Jones Road, then runs northwest for approximately 0.47 mile along the

Wheeling & Lake Erie Railway Company railroad, then west for approximately 0.98 mile across agricultural field and between two residential communities, then northwest for approximately 0.72 mile, crossing Pitts Road. The alternative route then runs north along Pitts Road for approximately 0.92 mile to the south side of the Wheeling & Lake Erie Railway Company railroad. The alternative route then runs west for approximately 1.57 miles, ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route parallels ATSI's Brookside-Wellington 138 kV Transmission Line and is located within ATSI's existing right-of-way for over half of the entire length of the alternative route but also cuts through a medium density residential area within the Village of Wellington.

Alternative Route 6 is approximately 5.27 miles long. From the Wellington Substation, the alternative route runs west for approximately 0.46 mile north of Jones Road, then runs northwest for approximately 0.47 mile along the Wheeling & Lake Erie Railway Company railroad, then west for approximately 0.98 mile across agricultural field and between two residential communities, then northwest for approximately 0.72 mile, crossing Pitts Road. The alternative route then runs north along Pitts Road for approximately 0.92 mile to the south side of the Wheeling & Lake Erie Railway Company railroad. The alternative route then runs west along the south side of the Wheeling & Lake Erie Railway Company railroad for approximately 0.61 mile before turning north, crossing the railroad and Norwalk Road and running west through agricultural fields ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route parallels ATSI's Brookside-Wellington 138 kV Transmission Line and is located within ATSI's existing right-of-way for first half of the alternative route but does cut through a medium density residential area within the Village of Wellington.

Alternative Route 7 is approximately 4.63 miles long. From the Wellington Substation, the alternative route runs west for approximately 0.46 mile, north of Jones Road, then runs northwest for approximately 1.83 miles along the Wheeling and Lake Erie Railroad Company railroad and cutting through the Village of Wellington near the Lorain County Fairground. The alternative route then runs west for approximately 2.34 miles along the south side of the Wheeling and Lake Erie Railroad Company railroad ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route parallels the railroad for almost the entire length of the route but cuts through the Village of Wellington and runs along the northern edge of the fairground.

Alternative Route 8 is approximately 4.78 miles long. From the Wellington Substation, the alternative route runs west for approximately 0.46 mile, north of Jones Road, then runs northwest for approximately 1.83 miles along the Wheeling and Lake Erie Railroad Company railroad and cutting through the Village of Wellington near the County Fair Grounds. The alternative route then runs west for approximately 1.44 miles along the south side of the Wheeling and Lake Erie Railroad Company railroad before turning north, crossing the railroad and Norwalk Road and running west through agricultural fields ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route also parallels the railroad for the majority of the route and also cuts through the Village of Wellington, running along the northern edge of the fairground

Alternative Route 9 is approximately 5.14 miles long. From the Wellington Substation, the alternative route runs north along Hawley Road for approximately 0.71 mile then west along Cemetery Road for approximately 1.35 miles. The alternative route then crosses of the railroad and runs northwest for approximately 0.75 mile along the Wheeling and Lake Erie Railroad Company railroad and cutting through the Village of Wellington near the County Fair Grounds. The alternative route then runs west for approximately 2.33 miles along the south side of the Wheeling and Lake Erie Railroad Company railroad ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route also parallels the railroad but cuts through the southern end of the NRHP-listed Wellington Historic District as well as across the northern edge of the fairground.

Alternative Route 10 is approximately 5.29 miles long. From the Wellington Substation, the alternative route runs north along Hawley Road for approximately 0.71 mile then west along Cemetery Road for approximately 1.35 miles. The alternative route then crosses of the railroad and runs northwest for approximately 0.75 mile along the Wheeling and Lake Erie Railroad Company railroad and cutting through the Village of Wellington near the County

Fair Grounds. The alternative route then runs west for approximately 1.43 miles along the south side of the Wheeling and Lake Erie Railroad Company railroad before turning north for approximately 0.1 mile, crossing the railroad and Norwalk Road and running west for approximately 0.95 mile through agricultural fields ending at ATSI's existing north-south Brookside-Henrietta 138 kV Transmission Line corridor. This route also parallels the railroad but cuts through the southern end of the NRHP-listed Wellington Historic District as well as across the northern edge of the fairground.

3.3.4 Suitability Score of Alternative Routes

After the alternative routes were developed, the siting team chose to complete an extra level of analysis using the raster-based suitability model to determine the suitability scores of each alternative route to identify routes that may be less suitable for a transmission line corridor than others. Completing this extra level of analysis allows for alternative routes that may be less suitable to be dropped earlier in the siting process, allowing the siting team to focus on the more suitable routes, based on suitability data scores. This extra level of analysis is feasible on this transmission line, and not the Brownhelm Section of the overall project, due to the larger study area and differences in the types of land area crossed between the ten alternative routes. The ten alternative routes are spread out, crossing the southern, middle and northern sections of the study area. Different constraints and opportunities are present in these areas resulting in areas that are more/less suitable for a proposed transmission line. Table 3-5 presents the suitability scoring for the ten alternative routes.

Table 3-5. Wellington Section Alternative Routes Suitability Scoring

Alternative Route	Study Segments	Ecological Suitability Score	Land Use Suitability Score	Technical Suitability Score	Overall Suitability Score	Rank (Based on Overall Suitability Score)
1	25-26-28	3.14	1.63	3.49	2.67	2
2	25-26-27	2.91	2.14	4.41	3.10	5
3	23-22-21-18-16-1	3.06	2.42	4.03	2.95	3
4	23-19-17-16-1	3.05	2.25	3.04	2.62	1
5	23-19-17-16-13-11-10-9	2.45	2.46	4.68	3.03	4
6	23-19-17-16-13-11-10-7-6-5	2.45	2.44	4.78	3.11	6
7	23-19-15-12-11-10-9	2.48	3.06	5.21	3.44	7
8	23-19-15-12-11-10-7-6-5	2.48	3.02	5.30	3.51	8
9	14-12-11-10-9	2.81	3.41	5.00	3.74	9
10	14-12-11-10-7-6-5	2.80	3.34	5.10	3.82	10

Based on the overall suitability scores, Route 7, Route 8, Route 9, and Route 10 were the lowest ranked routes largely due to higher land use and technical suitability scores compared to the other six alternative routes. Jacobs reviewed these four alternative routes and identified that they all included a combination of study segments 12, 14, and 15, which run close to higher density residential areas and the NRHP-listed Wellington Historic District within the Village of Wellington. Further, these routes also cross over the Wheeling and Lake Erie Railroad Company railroad numerous times and run along the northern part of the Lorain County Fairgrounds. For these reasons, the siting team determined Route 7, Route 8, Route 9, and Route 10 were less suitable for a transmission line corridor than the other six routes and were removed from the siting process.

4. Comparing Alternative Routes and Selection of a Preferred and Alternate Route

The previous section discussed the incremental process used to develop alternative routes for the Project. In this section, alternative routes were assessed and compared with natural and cultural resources, land uses, and engineering and construction concerns considered. Ultimately, through a quantitative and qualitative analysis and comparison of the alternative routes, including public feedback, the siting team identified a preferred route and an alternate route for inclusion in the CECPN application to the OPSB.

4.1 Weighted Scoring Evaluation Process

Based on the publicly available data assembled to identify opportunities and constraints for the study area, the siting team developed a set of evaluation criteria to quantitatively compare the six remaining alternative routes to one another (Appendix E). The data collected and used to evaluate and compare the routes was chosen based on its relevance to siting a transmission line within the Project's study area.

For comparison of the alternative routes, raw data for each route was collected, quantified, and then normalized to a dimensionless parameter (a "score," as described below). Lower scores indicate "better," higher scores indicate "worse."

Normalizing the data into a score is vital so that all the constraints are directly compared according to the same scale. It also allows the data categories to be weighted as the siting team determines, based on experience in siting numerous transmission projects and the constraints and opportunities identified within the study area. The following formula was used to normalize the raw data:

Normalized Score = ((Xij – Min Valuej) / Range) *100

where: i = xth value in constraint and j = constraint

This normalizing method uses the established range of collected data in a particular category to compare all route options to one another and avoids one constraint category being unintentionally influential.

The next step in this process was to weight the criteria within each category (ecological, land use/cultural, and technical) and across the three categories. Weighting recognizes that under certain circumstances, one evaluation criterion is more important, or relevant, in determining an outcome than another. The criteria weighting values were determined by consensus of the siting team and based on the specific Project area setting and primary land uses, and professional judgement of the siting team members' experience routing projects in a similar setting.

Based on the constraints and opportunities identified within the Project area, the siting team determined the following criteria to be most important: number of residences near the route, woodlots (removal), length of route, and paralleling existing transmission lines. These criteria were assigned weighting values that yield the most influence on the final route scores. Additional criteria comprising the final route scores can be seen in the graph in Appendix E.

The criteria were measured and calculated to assess potential impacts and benefits. For ecological constraints, impacts to woodlots and NWI wetlands were measured within the proposed right-of-way to account for construction and clearing of trees, while stream impacts were measured by the number of crossings to account for potential permitting requirements. Residences were counted within 100 feet and out to 1,000 feet from the route centerlines to reflect potential direct impacts from the alternative route as well as potential aesthetic impacts. Length of route and paralleling existing transmission line were both measured in units of distance to account for costs and reducing impacts to current land use. In addition, there were various other constraints and attributes that were measured (either in units of distance or total occurrences) along the centerline.

4.2 Comparing Alternative Routes

Once the weighted scoring evaluation process was complete, the siting team evaluated the scoring results, and started evaluating the best candidates for the Preferred and Alternate route for the Project. This process required the most collaboration among the different professional skill sets represented on the team. The route evaluation conducted during this phase of the process combined both the quantitative review as described in the previous section (4.1) as well as a qualitative process, where factors not necessarily represented in the weighted scoring process are evaluated.

4.2.1 Weighted Scoring Results

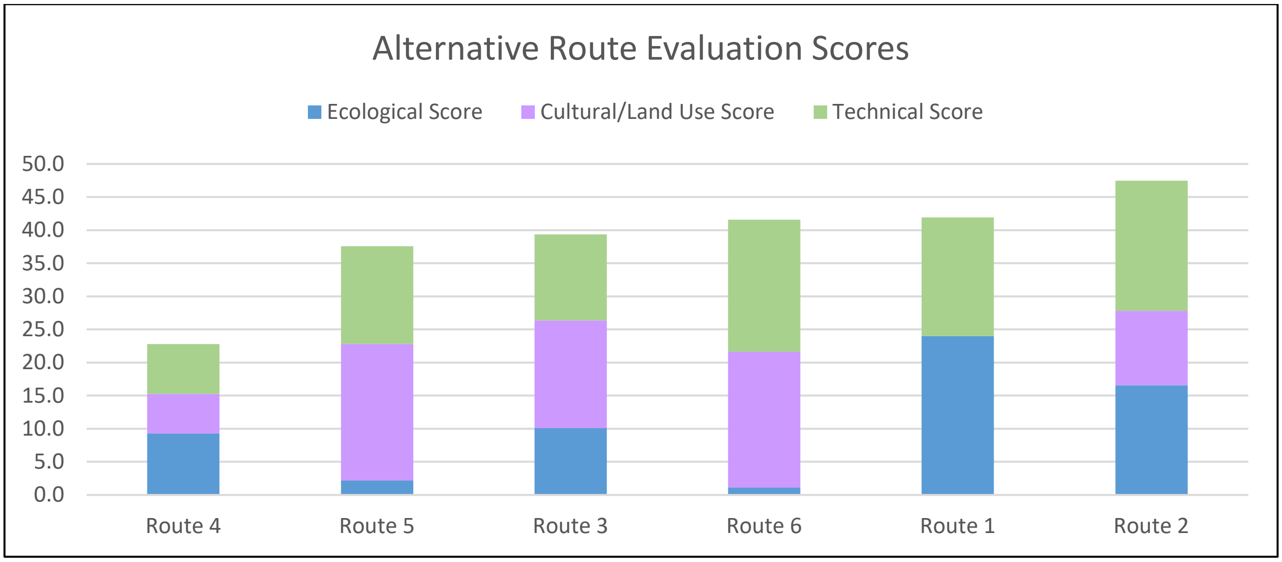
The six alternative routes developed from the Project's refined study segment network were evaluated and compared to one another through the quantitative scoring process described in Section 4.1 (Appendix F). Based on the data collected and route scores, the routes were first ranked by individual category (i.e. land use, ecological, technical, and cultural) then ranked by overall score.

Table 4-1 shows the six alternative routes sorted by overall score. The scores and ranks by category are also provided. The routes are also presented as a graphic plot in Graph 4-1 which illustrates that the routes ranged in overall score from 22.8 to 47.5. Additionally, Graph 4-1 also shows how each of the routes scored in each of the three categories.

Table 4-1. Wellington Section Alternative Route Evaluation Scores

Routes (Study Segments)	Ecological Score	Ecological Rank	Land Use/ Cultural Score	Land Use/ Cultural Rank	Technical Score	Technical Rank	Final Score	Overall Rank
Route 4 (23-19-17-16-1)	9.3	3	6.0	2	7.5	1	22.8	1
Route 5 (23-19-17-16-13-11-10-9)	2.2	2	20.6	6	14.8	3	37.6	2
Route 3 (23-22-21-18-16-1)	10.1	4	16.3	4	13.0	2	39.4	3
Route 6 (23-19-17-16-13-11-10-7-6-5)	1.1	1	20.5	5	19.9	6	41.6	4
Route 1 (25-26-28)	24.0	6	0.0	1	17.9	4	41.9	5
Route 2 (25-26-27)	16.5	5	11.3	3	19.7	5	47.5	6

Graph 4-1. Alternative Route Evaluation Scores



Route 4 (study segments 23-19-17-16-1) was identified as the top-ranked route resulting from the weighted scoring process due to its low cultural/land use score and low technical score. Route 4 is the shortest route at 4.19 miles long and has the second least number of residences within 100 feet of centerline, and fewer property owners are crossed by the right-of-way than most of the routes (29, compared to a range of 28-61). Route 4 also parallels ATSI's Brookside-Wellington 138 kV Transmission Line the entire length of the route.

Route 5 (study segments 23-19-17-16-13-11-10-9) scored second in the ranking from the weighted scoring process due to its low ecological score and low technical score. Route 5 has less acres of woodlots within the right-of-way (22.9 acres, compared to a range of 19.4 acres to 43.4 acres), the smallest area of NWI wetlands within the right-or-way (1.17 acres), and the fewest number of stream crossings (3) when compared to other routes. Route 5 parallels the existing Brookside-Wellington 138 kV Transmission Line for approximately 50 percent of the length then parallels roadway and the Wheeling and Lake Erie Railroad Company railroad for the remainder of the length.

4.2.2 Alternative Routes Discussion

The siting team met on December 2, 2019 to discuss all the alternative routes and select the two alternative routes to advance to the next siting step involving public input in a public information meeting. The team considered both the quantitative scores and ranks as well as qualitative factors through professional judgement.

Route 4 and Route 5 were briefly discussed based on the information presented in Section 4.2.1. Route 4 is the shortest route and top-ranked route based on the weighted scoring, but it passes through the medium-density residential area within the Village of Wellington. The siting team took into consideration that Route 4 is located entirely within ATSI's existing right-of-way; therefore, no additional right-of-way would need to be acquired from property owners. Route 5 ranked second and had one of the lowest ecological scores due to avoiding a large forested area by paralleling the railroad. Similar to Route 4, Route 5 also passes through the medium-density residential area within the Village of Wellington.

Route 3 (study segments 23-22-21-18-16-1) was identified as the third ranked route. This route runs along Jones Road then north towards the reservoir before paralleling ATSI's Brookside-Wellington 138 kV Transmission Line. This route avoids the medium-density residential area within the Village of Wellington but instead runs along the southern edge of the residential area resulting in 138 kV transmission lines on the north, west, and south side of the neighborhood.

Route 6 (study segments 23-19-17-16-13-11-10-7-6-5) was identified as the fourth ranked route. This route is similar to Route 5 except that it passes through agricultural fields rather than parallel to the Wheeling and Lake Erie Railroad Company railroad at the western end of the route. Route 6 had the lowest ecological score because it avoids forested areas but similar to Route 4 and Route 5, Route 6, it passes through the medium-density residential area within the Village of Wellington.

Route 1 (study segments 25-26-28) and Route 2 (study segments 25-26-27) were identified as the fifth and sixth ranked routes. Both routes have higher ecological impacts and longer in length compared to the other alternative routes. Route 1 scored better than Route 2 because it has no residences within 100 feet of centerline, has the fewest residences within 1,000 feet of centerline (14), and crosses the fewest number of property owners. Route 2 also parallels ATSI's existing Hanville-Wellington 69 kV Transmission Line for the entire length of the route.

The Ohio Administrative Code (OAC) Rule 4906-03-05 states: "two routes shall be considered as alternatives if not more than 20 percent of the routes are in common. The percentage in common shall be calculated based on the shorter of the two routes." Because of this requirement, ATSI was required to identify two alternative routes for selection as the Preferred and Alternate Route, each having less than 20 percent in common.

Based on the weighted scoring and qualitative factors previously discussed, Route 4 was the best ranked route and the siting team agreed that Route 4 was one of the two route alternatives to present to the public for comment. Route 3, Route 5, and Route 6 had more than 20 percent in common with Route 4; therefore, these routes did not meet the OPSB requirement and were removed from consideration.

Route 1 was the next best scoring route with less than 20 percent in common with Route 4. Since Route 1 was ranked lower than most of the other alternative routes, the siting team reviewed all the alternative routes and study segments and identified another alternative route option (Route 11 – study segments 23-22-21-18-16-13-11-10-9) that met OAC Rule 4906-03-05. The siting team evaluated Route 11 by re-running the weighted scoring and determined that Route 11 ranked last due to having the most residences within 100 feet (11) and 1,000 feet (216) of centerline as well as crossing the highest number of property owners (77). Based on this information, the siting team selected Route 1 as the other route to present to the public. For the public information meeting, the routes were identified as Alternative 1 (Route 4) and Alternative 2 (Route 1) (Figure 8).

4.3 Public Information Meeting

A public information meeting was conducted for the Project on January 8, 2020 from 6:00 pm to 8:00 pm at the Wellington High School, which is approximately 1.94 miles west of the middle of the study area. This location was selected because, pursuant to OAC Rule 4906-3-03, the meeting must be held in the area in which the Project is located so that landowners within the Project area could attend. The community was notified about the time and location of the meeting through the following means:

1. All property owners having land crossed by the proposed alternative routes, as well as immediately adjacent landowners were sent letters on December 16, 2019, notifying them of the public information meeting.

2. A notice was also posted in the local newspaper, The Morning Journal, on December 19, 2019, in compliance with OPSB specifications.

The siting team set up stations at the meeting and provided information related to engineering and design of the structures, Project need, real estate and right-of-way information, and the siting process. Detailed maps of the alternative routes were available for viewing and the Project staff members present for questions and listening to comments from the public. Property boundaries were also indicated on the mapping with the unique parcel identification numbers referenced to ownership spreadsheets.

Comment sheets were distributed to all meeting attendees. Attendees were asked to fill out the sheet completely, including contact information. Approximately 28 members of the public attended the public information meeting and 14 comments were collected. Some attendees requested the project email address in order to submit comments after the meeting and were provided with cards featuring the email address and hotline. Six additional comments were received by email and three additional comments were filed with the OPSB as of July 10, 2020. The most recent comment was received on April 13, 2020.

Comments from the public information meeting were reviewed and stored in the Project database as a record of meeting attendance and public comments. Public comments received included concerns about impacts on property value, electric and magnetic fields, impacts on farmland, impacts on wetlands and trees, and questions regarding the possibility of rebuilding the existing Hanville-Wellington 69 kV Transmission Line as a double circuit.

4.4 Public Feedback Adjustments

Following the public information meeting, the siting team met on January 20, 2020 to discuss any adjustments based on public feedback. Comments received during the public information meeting took issue with the location of Alternative 2 paralleling the existing Hanville-Wellington 69 kV Transmission Line. The landowners were concerned with the additional environmental impact that may result from routing the transmission line parallel to an existing transmission line. Many of the residents along Alternative 2 mentioned they would rather see the existing 69 kV line rebuilt to accommodate a 138 kV circuit than construct a new parallel line. ATSI reviewed the future plans for the Hanville-Wellington 69 kV Transmission Line and determined that it is scheduled for rebuild as a double circuit line with the existing 69 kV transmission line on one side and open arms for a future 138 kV transmission line on the other side.

Based on this information, ATSI decided to shift Alternative 2’s alignment to the existing Hanville-Wellington 69 kV Transmission Line alignment and use the open arms for the 138 kV circuit. ATSI also reviewed right-of-way width and determined the right-of-way width could be reduced to 65 feet, minimizing the Project’s footprint in the area. The adjustments made to Alternative 2 are shown on Figure 9.

Because of the adjustments made to Alternative 2 (now the Hanville-Wellington 69 kV rebuild alignment) and a reduction in required right-of-way-width to 65 feet, the siting team re-evaluated both alternatives by re-running the weighted scoring and reviewing the qualitative data for each alternative route. Based on the revised weighted scoring, Alternative 1 still ranked better than Alternative 2.

4.5 Detailed Engineering Adjustments

Typically, detailed engineering of proposed projects occurs during the OPSB review process and is finalized once the OPSB issues a decision. Often, detailed engineering results in minor route adjustments to the proposed route alignments which may need to be submitted to the OPSB as an amendment, delaying the start of construction. To reduce potential changes to the route alignments following submission of the Application to the OPSB, ATSI began detailed engineering on both route alternatives once adjustments due to landowner feedback were complete.

No adjustments were made to Alternative 1. One minor adjustment was made to Alternative 2 to move the transmission line out of the Wellington Substation to the east side of the substation. The transmission line now exits the substation heading east then immediately turns south, crossing Jones Road. The transmission line then runs parallel to Jones Road for approximately 340 feet before turning south on the Hanville-Wellington 69 kV rebuild alignment. This adjustment is shown on Figure 9.

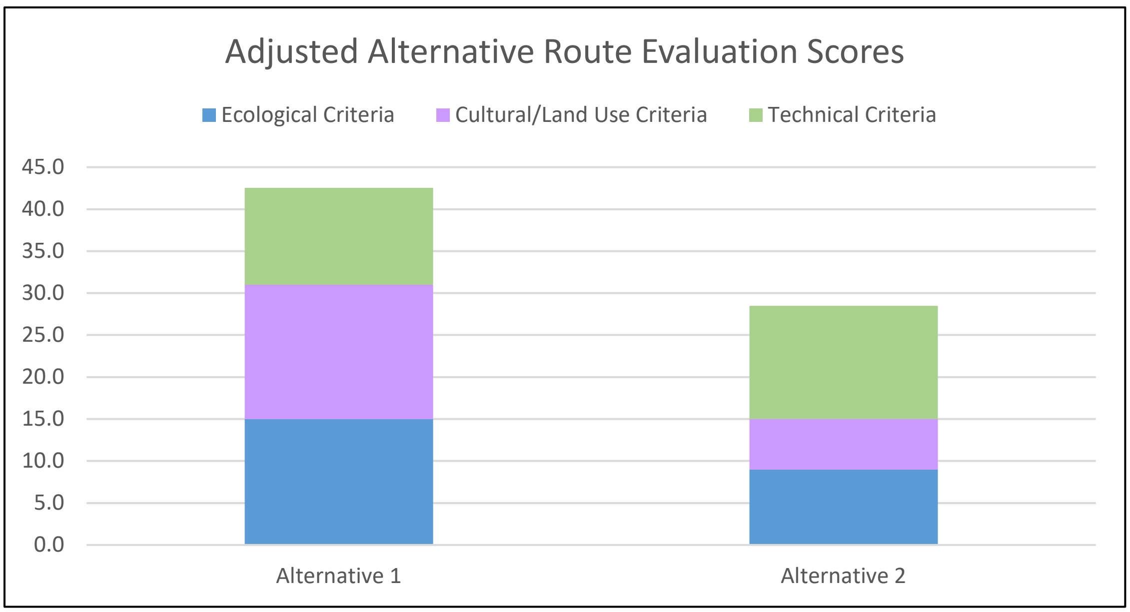
Because of the engineering adjustments made to Alternative 2, the siting team re-evaluated both Alternative 1 and Alternative 2 again by re-calculating the weighted scoring (Appendix F). Up to this point in the siting process, some of the categories were assessed based on desktop data (i.e., NWI wetlands within the ROW, NHD streams crossed). Since ATSI had completed wetland and waterbody surveys along Alternative 1 and Alternative 2 alignments, the siting team choose to use the field survey data to more accurately evaluate and compare the two alternatives.

Table 4-2 shows the alternative routes sorted by overall score. The scores and ranks by category are also provided. The routes are also presented as a graphic plot in Graph 4-2.

Table 4-2. Wellington Section Adjusted Alternative Route Evaluation Scores

Route	Ecological Score	Ecological Rank	Land Use/ Cultural Score	Land Use/ Cultural Rank	Technical Score	Technical Rank	Final Score	Overall Rank
Alternative 1	15.0	2	16.0	2	11.5	1	42.5	2
Alternative 2	9.0	1	6.0	1	13.5	2	28.5	1

Graph 4-2. Adjusted Alternative Route Evaluation Scores



Alternative 1:

Based on the revised weighted scoring, Alternative 1 ranked number 2. Alternative 1 has more woodlots within the right-of-way compared to Alternative 2. Alternative 1 also has residences within 100 feet of centerline (2) and more residences within 1,000 feet from centerline compared to Alternative 2 because this alternative runs through the southern part of the Village of Wellington.

Alternative 1 would be constructed as a single circuit 138 kV line paralleling an existing 138 kV transmission line. This alternative does not require the acquisition of additional right-of-way; however, new structures will need to be installed. Alternative 1 will have a greater visual impact because, if constructed, there would be two single-circuit transmission lines and structures located next to each other, as opposed to one structure using double-circuit construction in the case of Alternative 2. Additionally, this alternative would occupy more land, crossing through a residential neighborhood and agricultural fields. Since ATSI already has right-of-way along Alternative 1, no new right-of-way will need be required.

Alternative 2:

Based on the revised weighted scoring, Alternative 2 ranked number 1. Alternative 2 has less woodlots within the right-of-way compared to Alternative 1 because it utilizes the existing maintained right-of-way for the Hanville-Wellington 69 kV Transmission Line. Alternative 2 also has no residences within 100 feet of centerline and fewer residences within 1,000 feet of centerline compared to Alternative 1.

Alternative 2 would require rebuilding the existing single-circuit 69 kV structures to double circuit 69/138 kV structures but would utilize the existing right-of-way, reducing impacts to surrounding land use. Currently the existing right-of-way width for the existing 69 kV line is 50 feet. A double circuit 69/138 kV would require a 65-foot right-of-way width and therefore, ATSI would need to acquire an additional 15 feet of right-of-way to operate the transmission line within ATSI standards. Since ATSI would be rebuilding on existing centerline, there would only be a minor visual impact as the structures would be slightly larger and taller.

4.6 Selection of the Preferred and Alternate Route

Following the engineering adjustments, the siting team decided on a Preferred Route and an Alternate Route for inclusion in the CECPN application. After a comprehensive review of the alternatives, the siting team selected Alternative 2 as the Preferred Route and Alternative 1 as the Alternate Route (Figure 10). This decision was made based on quantitative and qualitative factors.

The metrics of the revised weighted scoring ranks Alternative 2 better than Alternative 1 primarily because Alternative 2 has less woodlot within the right-of-way. The quantitative data measured in the scoring does not consider several major qualitative factors that further support the improved ranking of Alternative 2. These qualitative factors include visual impacts, land owner feedback from the public open house, and the fact that Alternative 2 would utilize a common structure to carry the proposed 138 kV line as well as the existing 69 kV line.

Visual Impacts. Alternative 1 proposes the new 138 kV transmission line to be located on single circuit structures adjacent to existing H-frame 138 kV structures. Per ATSI's planning guidelines, the existing corridor would not be rebuilt with common double-circuit 138 kV structures that accommodate both the existing and proposed line; therefore, a wider right-of-way to accommodate both individual structures would be needed. The wider right-of-way will require a larger swath of tree clearing as the existing right-of-way is not cleared to its full extent. Additionally, adjacent structures within the right-of-way will have a more pronounced visual impact and presence within the residential area. As the numeric scoring shows, Alternative 1 is adjacent to seven times more residences than Alternative 2.

In contrast, Alternative 2 is proposed to rebuild an existing 69 kV transmission line with a double-circuit common structure that would carry both the 138 kV and 69 kV circuits. The use of a common structure requires only 65 feet of right-of-way width when compared to the 130 foot of right-of-way needed for Alternative 1 which is needed to accommodate two adjacent 138 kV circuits. Alternative 2 passes near fewer residences; therefore, though the double-circuit structures would be slightly taller than the existing single-circuit 69 kV structures, there would be fewer residences impacted in terms of residents' viewshed. Lastly, and perhaps the most prominent, only one set of structures would be located within the right-of-way, as opposed to two adjacent sets of structures.

Though the quantitative scoring method captures the number of residential properties crossed, it does not capture Alternative 2's superiority with regard to right-of-way width, and common structure usage. The aforementioned would give Alternative 2 the advantage over Alternative 1 because Alternative 2 would reduce the visual impact of the Project on the community.

Landowner Feedback. ATSI held one open house in the Project study area on January 8, 2020. It was the siting team's observation that the public overwhelmingly supported Alternative 2 for many of the same reasons already noted. The landowners along Alternative 1 noted the increased visual impacts that would derive from having two adjacent structures along a wide right-of-way, especially through the residential area. Land owners along Alternative 2 suggested rebuilding the existing 69 kV line within the existing right-of-way because it would not alter the location or have a significant visual change in the area.

4.7 Virtual Public Information Session

Due to delays in filing the Application following the initial public information meeting, ATSI was required to conduct a second public engagement process before filing the Application with the OPSB. Because of the ongoing COVID-19 pandemic and the restrictions on public meetings, ATSI conducted a virtual open house forum (website) between July 15, 2020, and August 14, 2020. This alternative public engagement process was developed and conducted in lieu of an additional in-person public information meeting to maintain a safe environment for everyone involved while providing the community with the chance to gather information and provide feedback on the project. The alternative public engagement process was agreed to by the OPSB on June 1, 2020, through a letter of no objection to ATSI's May 15, 2020 request for waiver of Ohio Administrative Code 4906-3-03(B), and approved by Administrative Law Judge Michael L. Williams on June 9, 2020.

The alternative public engagement process focused on three main components. First, letters were provided to residents and tenants along the proposed project with a basic overview of the project and how it relates to their property. Second, ATSI prepared and posted to the project website a presentation that explores many elements of the project, including identification of the Preferred and Alternate Routes. Finally, ATSI provided several avenues for members of the community to communicate questions and concerns including scheduling an individual conference call with ATSI representatives to discuss the project.

Four comments/questions were received between July 15, 2020, and August 14, 2020, and reviewed by the siting team. Public comments/questions received included requests for additional materials to help identify individual properties in relation to the proposed project, questions regarding right-of-way impacts and questions about upgrading transmission lines. No comments were received during this process that changed the analysis or the basis for the selection of the Preferred and Alternate Routes.

5. Conclusion

The siting team conducted a detailed Route Selection Study to identify and evaluate practical transmission alternatives for the Wellington Section of the Beaver-Wellington 138 kV Transmission Line Project. Using detailed constraint and opportunity data and through an iterative process, the siting team developed and evaluated 11 alternative routes. The top two scoring alternative routes with less than 20 percent in common were presented at a public information meeting on January 8, 2020. At this meeting, Route 4, designated as Alternative 1, and Route 1, designated as Alternative 2, were presented for public comment.

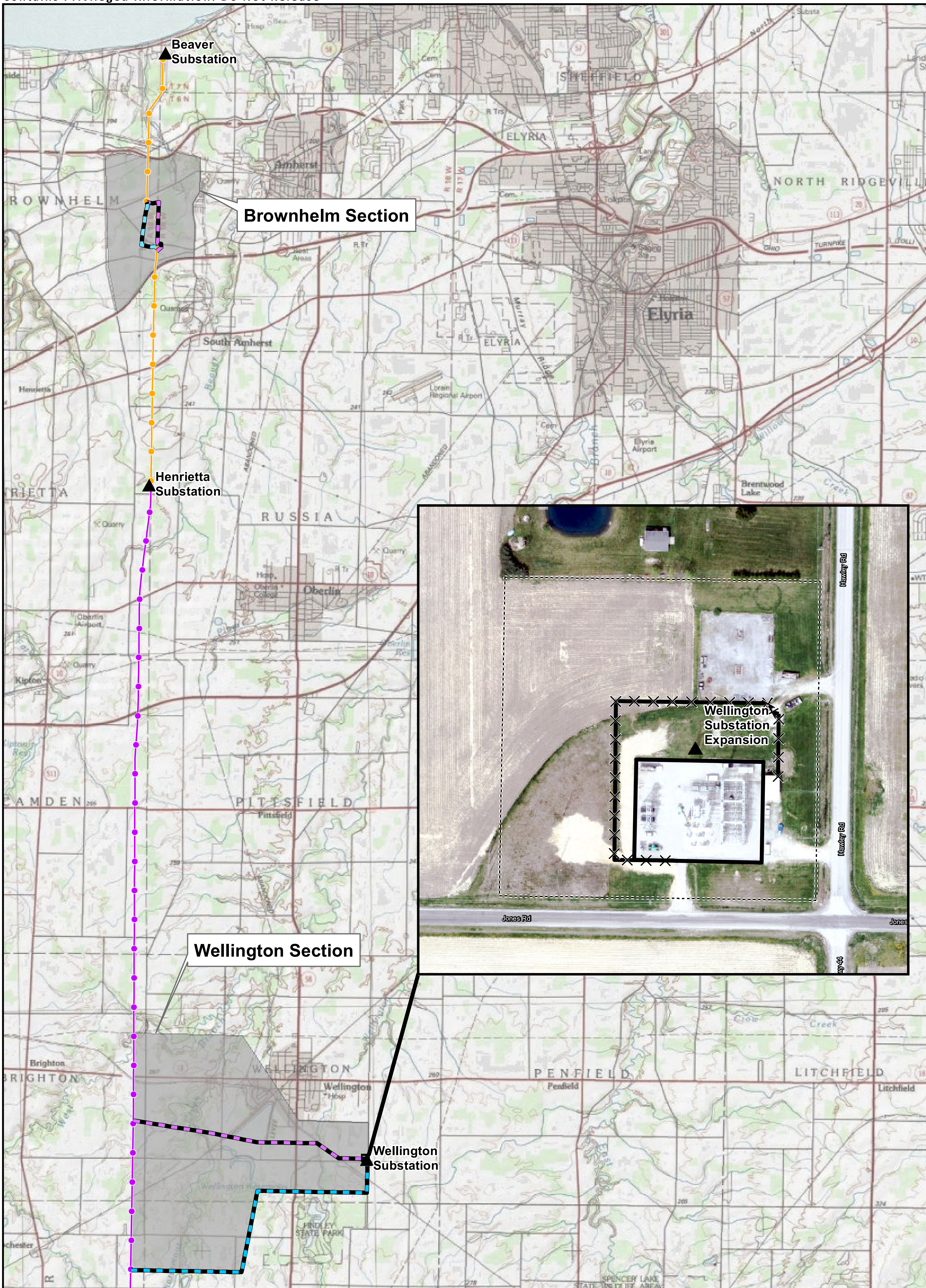
Based on input from landowners during the meeting, Alternative 2 was adjusted for rebuilding the existing Hanville-Wellington 69 kV Transmission Line as a double circuit 69/138 kV transmission line (rather than paralleling the existing 69 kV transmission line). Minor engineering adjustments were also made to Alternative 2 to change the alignment into the Wellington Substation to the east side of the substation. With the changes incorporated into Alternative 2, the siting team selected Alternative 2 as the Preferred Route. Several qualitative factors listed below were taken into consideration, along with the quantitative scoring. The qualitative factors taken into consideration included:

- less viewshed and visual impact from the new transmission structures on residents,
- property owners along Alternative 2 suggested the rebuilding of the existing 69 kV line within the existing right-of-way because it would not alter the location or have significant visual impacts to residents; and
- Alternative 2 would utilize a common structure to carry both the proposed 138 kV line and the existing 69 kV line as well as utilize the existing right-of-way rather than adding additional transmission line structures to the landscape.

Based on the information presented above, the siting team selected Alternative 2 as the Preferred Route and Alternative 1 as the Alternate Route.

The Preferred and Alternate Routes were presented as such during the second public engagement process and no comments were received that changed the analysis of these routes or their location.

Figures



LEGEND:

- Substation
- Preferred Route
- Alternative Route
- Beaver-Henrietta 138kV Transmission Line
- Brookside-Henrietta 138kV Transmission Line
- Study Area

Wellington Substation Expansion

- Proposed Expansion
- Existing Fenceline
- Possible Limits of Disturbance

LOCATOR MAP

N

BASE MAP SOURCE: Esri USA Topo Map

0 1.5 3

MILES

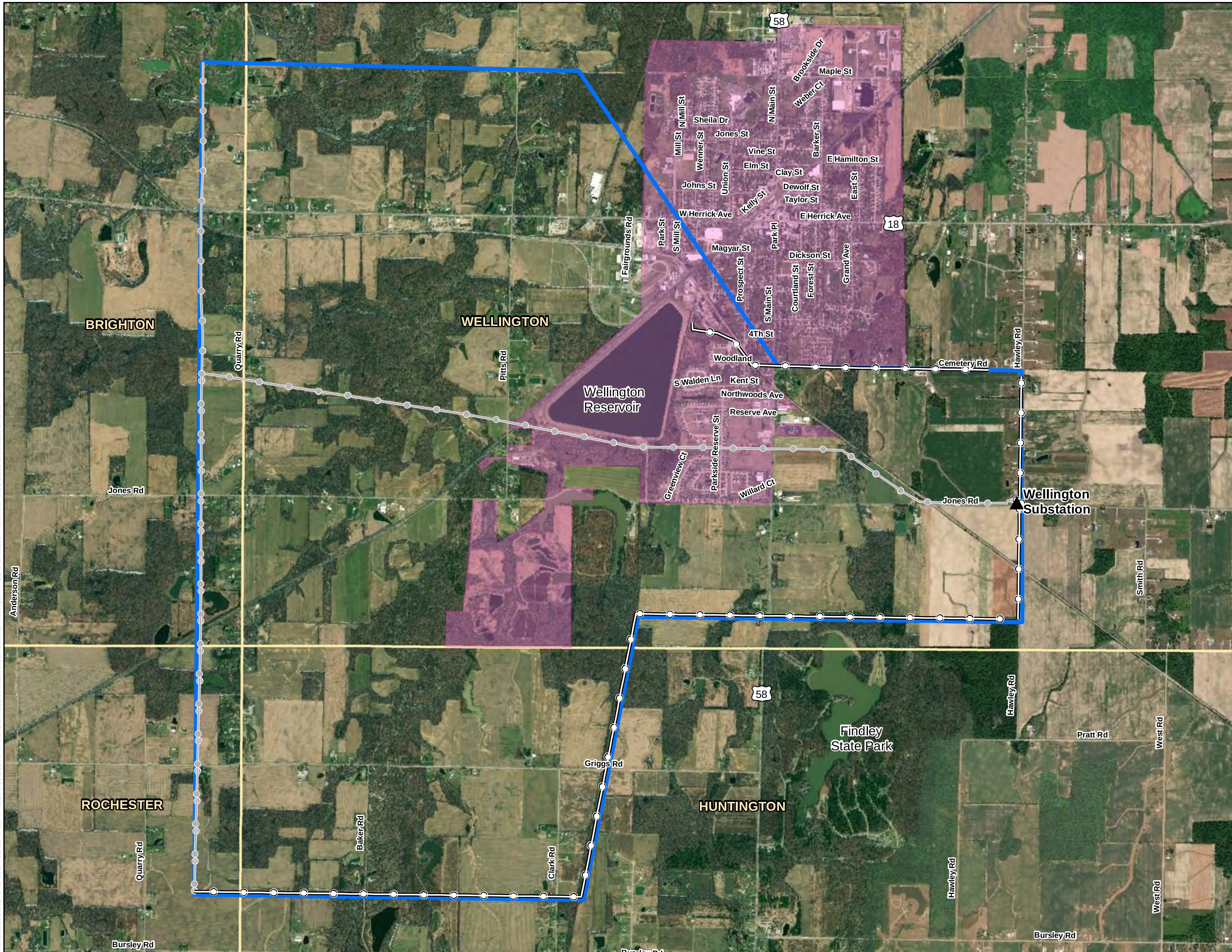
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project

Figure 1
Overview Map

4/30/2020

Jacobs



LEGEND:

- Substation
- Village of Wellington Boundary
- Township Boundary
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1
MILES

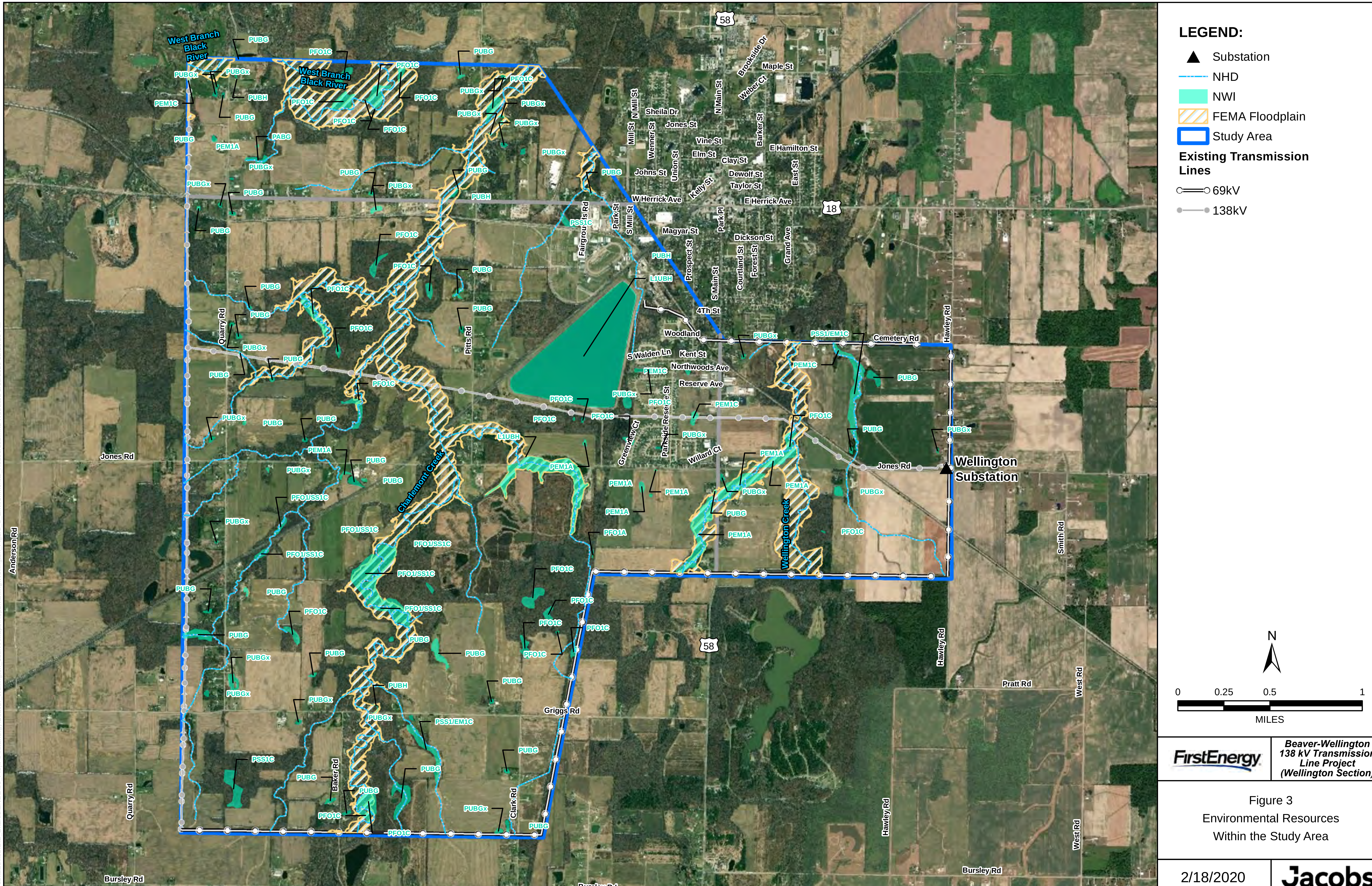
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 2
Study Area

2/18/2020

Jacobs



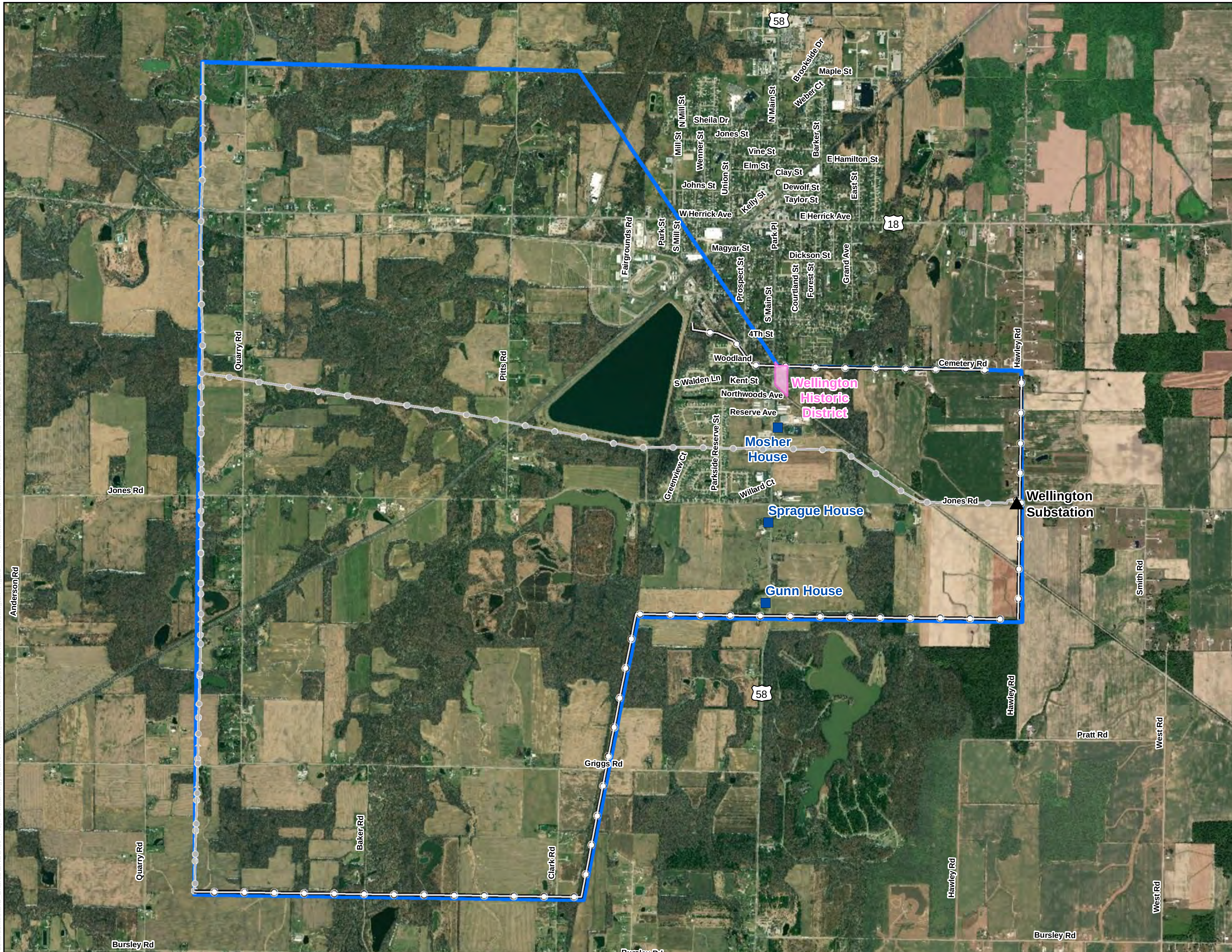
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 3
Environmental Resources
Within the Study Area

2/18/2020

Jacobs



LEGEND:

- Substation
- Historic Structure
- NRHP District Boundary
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1
MILES

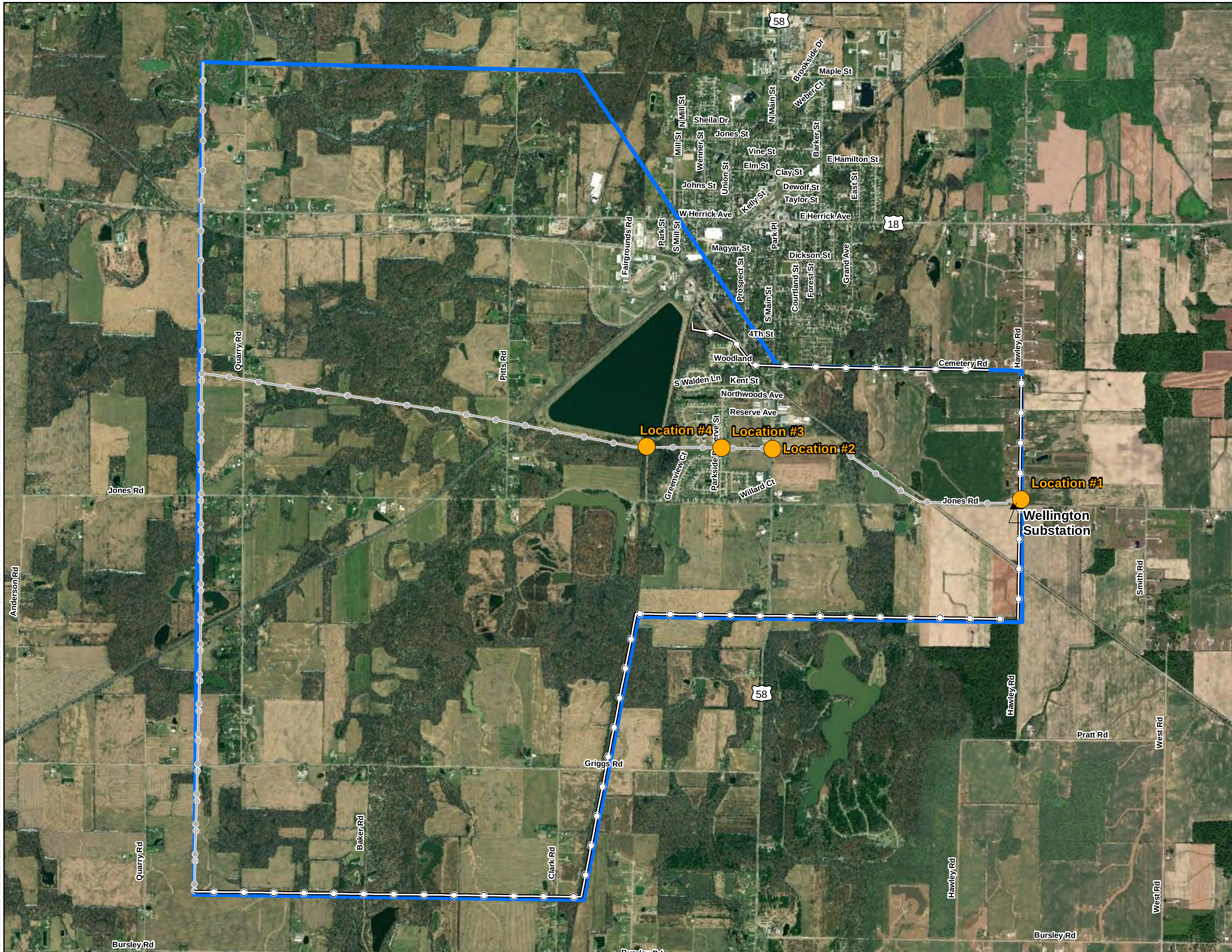
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 4
Architectural and Historic Resources within the Study Area

2/18/2020

Jacobs



LEGEND:

- Substation
- Field Review Location
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1

MILES

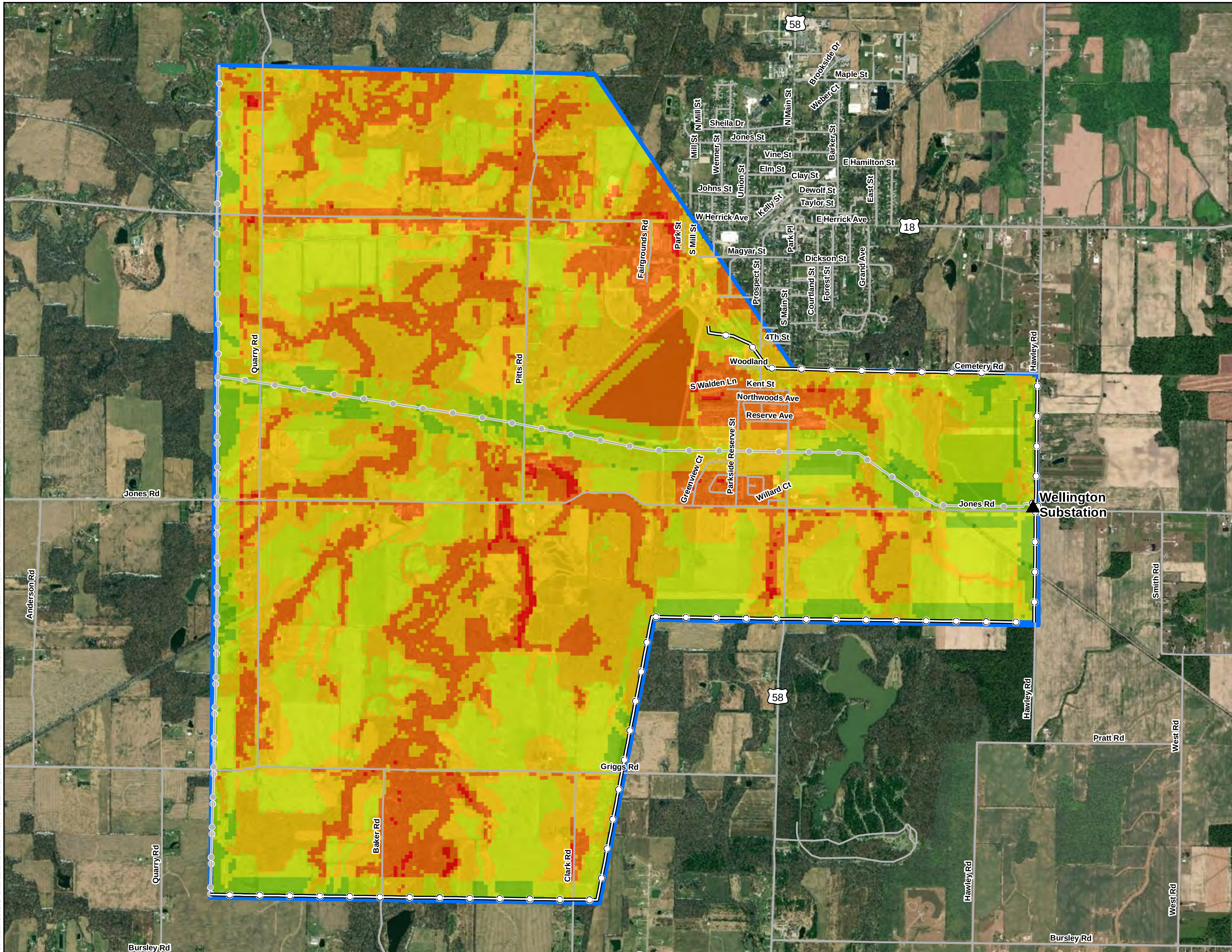
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 5
Field Review Locations

2/18/2020

Jacobs



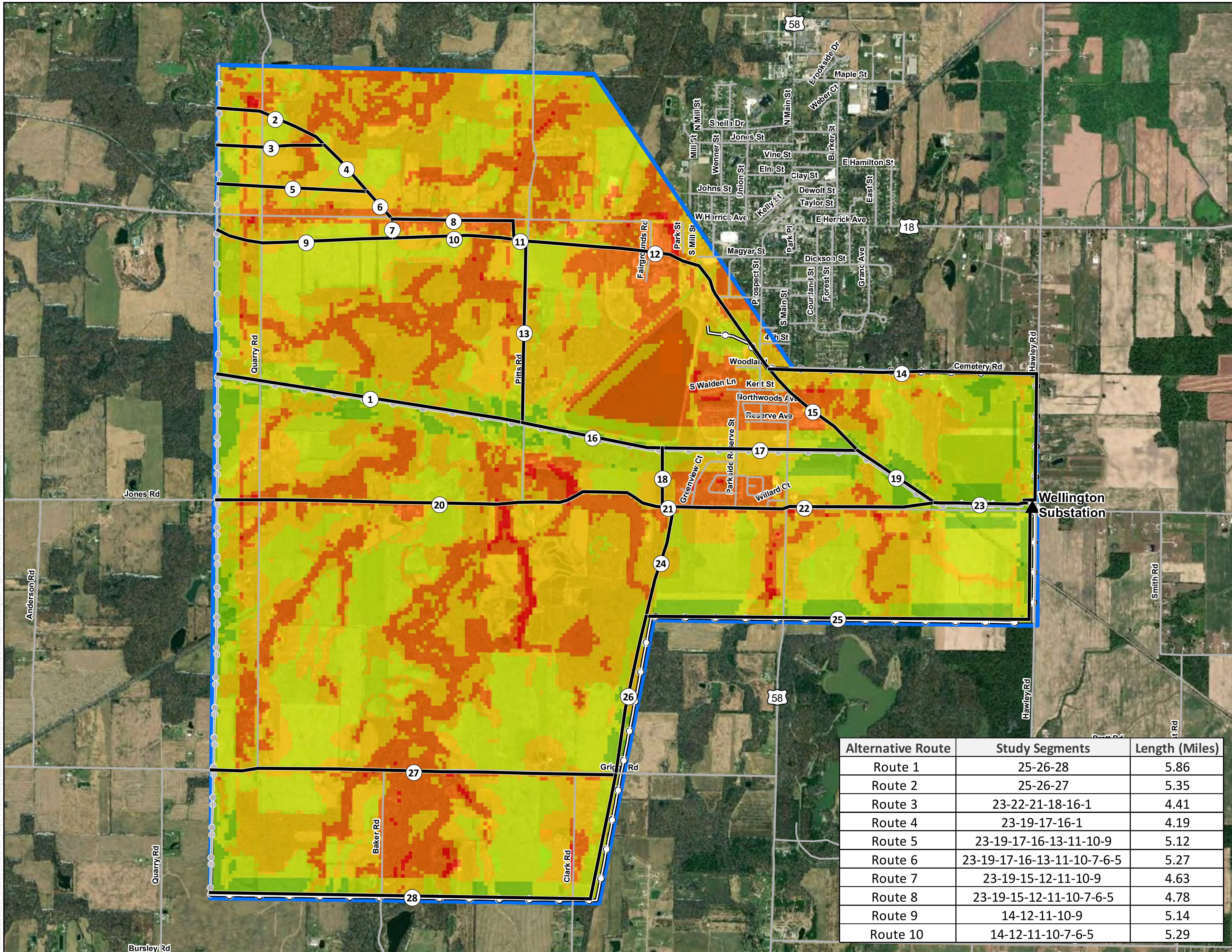
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 6
Overall Suitability Model

2/18/2020

Jacobs



Alternative Route	Study Segments	Length (Miles)
Route 1	25-26-28	5.86
Route 2	25-26-27	5.35
Route 3	23-22-21-18-16-1	4.41
Route 4	23-19-17-16-1	4.19
Route 5	23-19-17-16-13-11-10-9	5.12
Route 6	23-19-17-16-13-11-10-7-6-5	5.27
Route 7	23-19-15-12-11-10-9	4.63
Route 8	23-19-15-12-11-10-7-6-5	4.78
Route 9	14-12-11-10-9	5.14
Route 10	14-12-11-10-7-6-5	5.29

LEGEND:

- Substation
- Study Segment Number
- Study Segments
- Road
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

Suitability Model Value

Least Suitable

Most Suitable

N

0 0.25 0.5 1

MILES

FirstEnergy

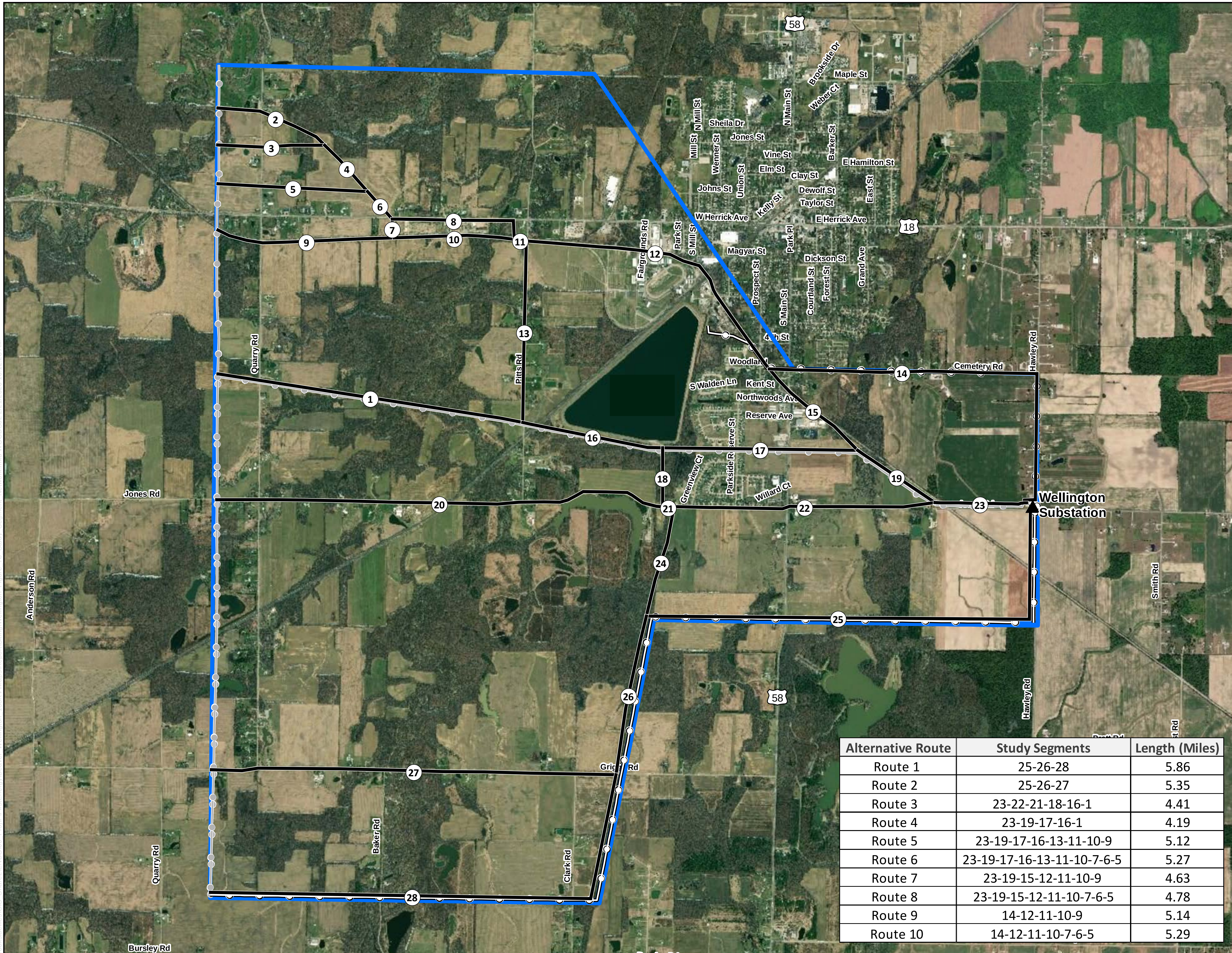
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 7a

Study Segment Network and Alternative Routes

2/19/2020

Jacobs



Alternative Route	Study Segments	Length (Miles)
Route 1	25-26-28	5.86
Route 2	25-26-27	5.35
Route 3	23-22-21-18-16-1	4.41
Route 4	23-19-17-16-1	4.19
Route 5	23-19-17-16-13-11-10-9	5.12
Route 6	23-19-17-16-13-11-10-7-6-5	5.27
Route 7	23-19-15-12-11-10-9	4.63
Route 8	23-19-15-12-11-10-7-6-5	4.78
Route 9	14-12-11-10-9	5.14
Route 10	14-12-11-10-7-6-5	5.29

LEGEND:

- Substation
- Study Segment Number
- Study Segment
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1

MILES

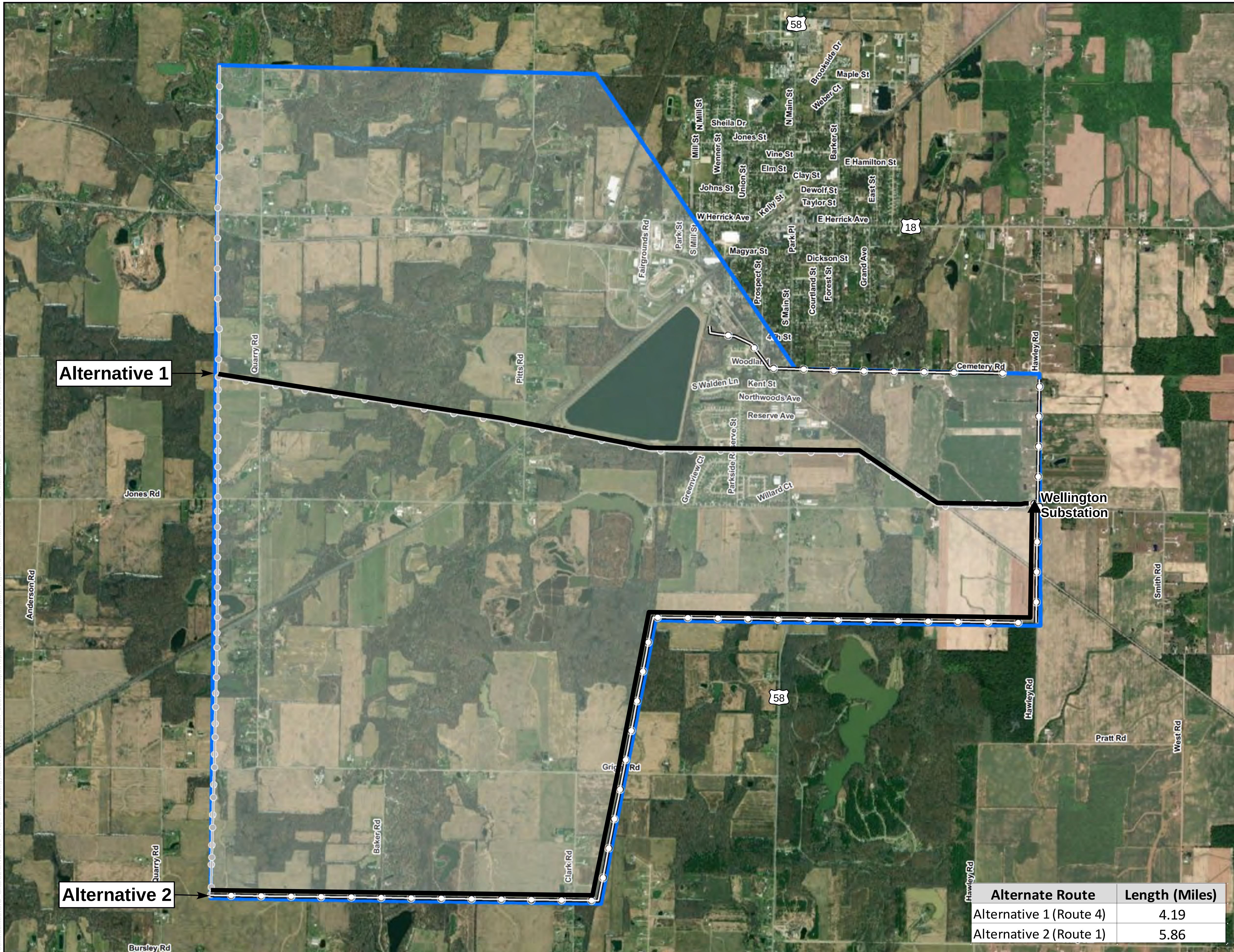
FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 7b
Study Segment Network and Alternative Routes

2/21/2020

Jacobs



Alternate Route	Length (Miles)
Alternative 1 (Route 4)	4.19
Alternative 2 (Route 1)	5.86

LEGEND:

- ▲ Substation
- Alternative Routes
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1

MILES

FirstEnergy

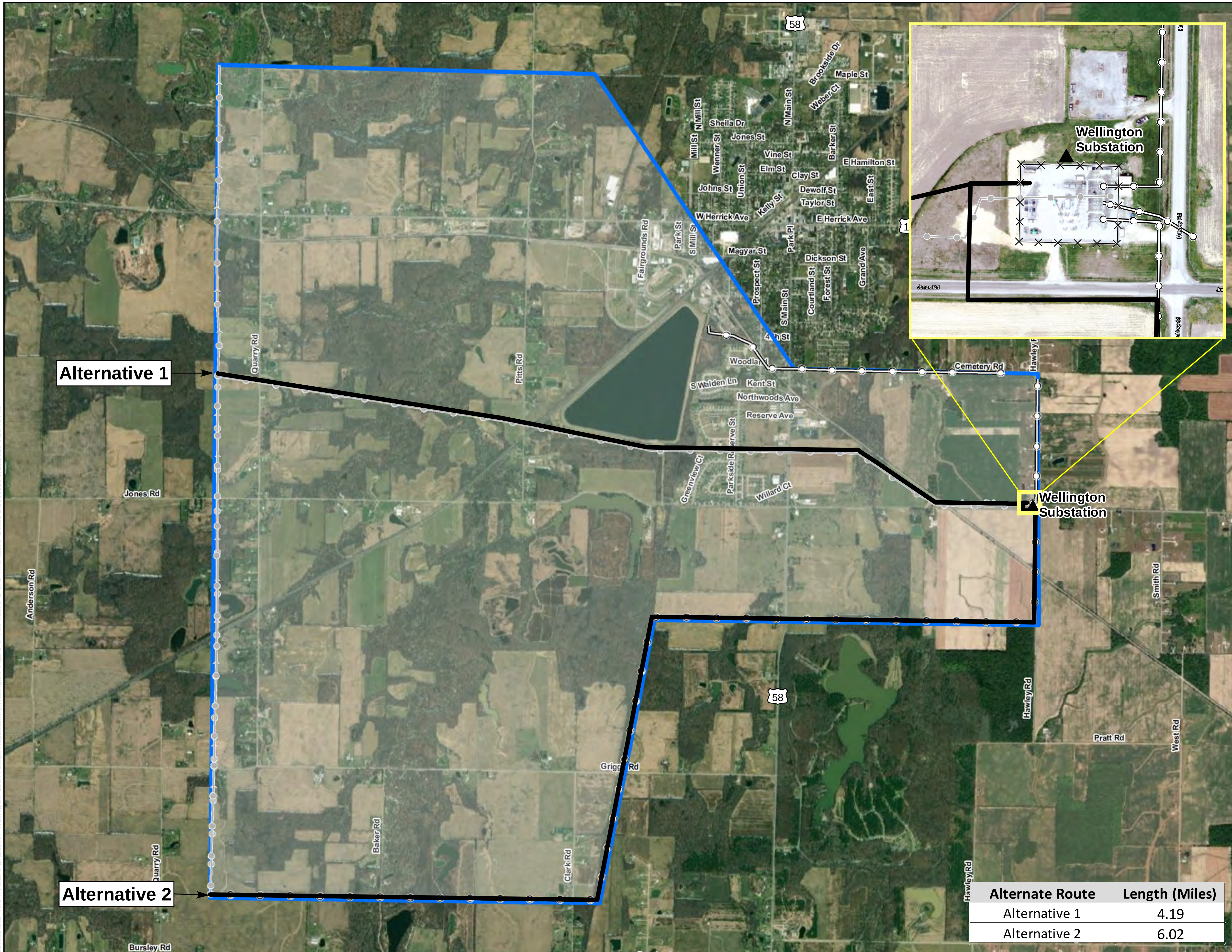
Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 8

Alternative 1 and Alternative 2

7/9/2020

Jacobs



Alternate Route	Length (Miles)
Alternative 1	4.19
Alternative 2	6.02

LEGEND:

- Substation
- Alternative Routes
- Existing Fenceline
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1
MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

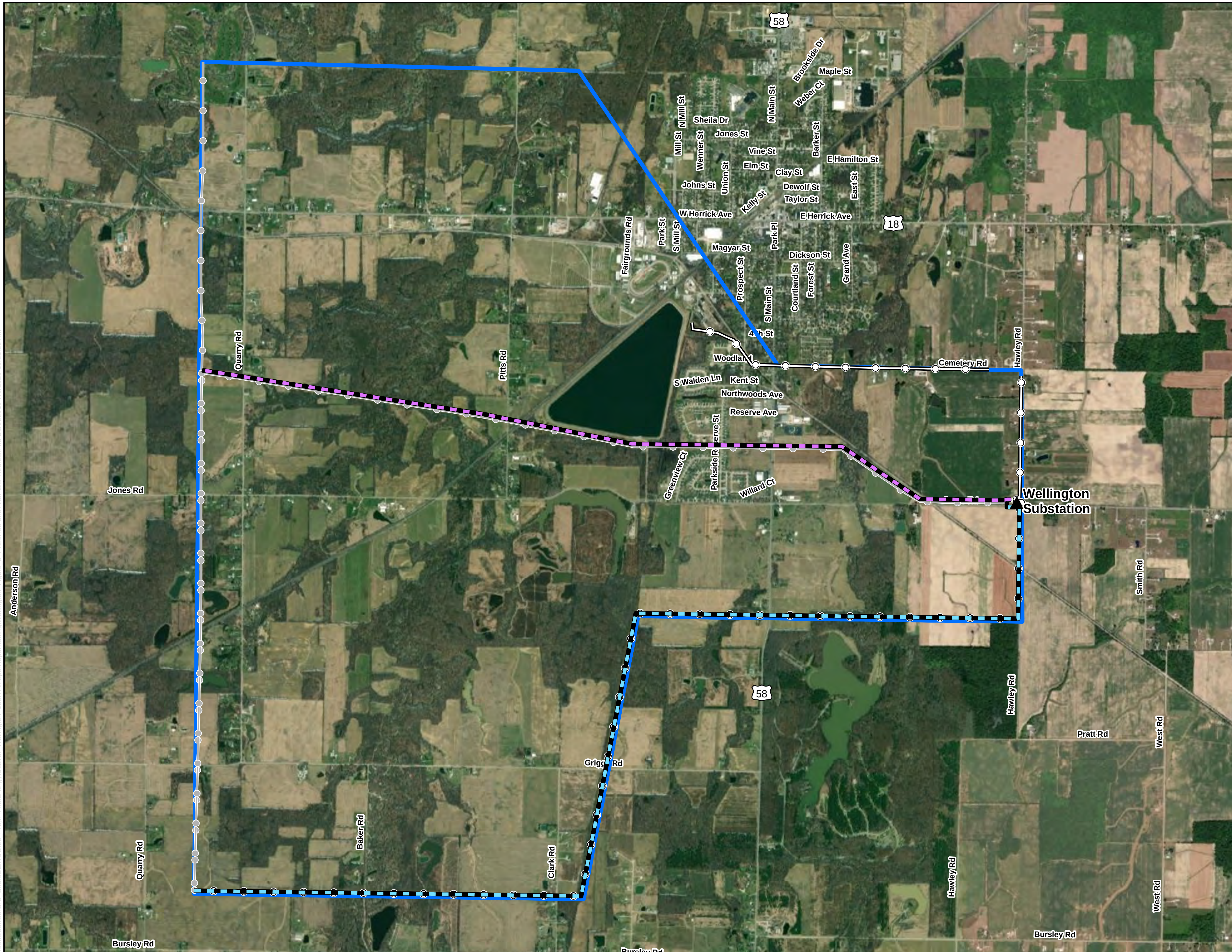
Figure 9

Alternative 1 and Alternative 2

Adjustments

7/15/2020

Jacobs



LEGEND:

- Substation
- Preferred Route
- Alternative Route
- Study Area

Existing Transmission Lines

- 69kV
- 138kV

N

0 0.25 0.5 1

MILES

FirstEnergy

Beaver-Wellington 138 kV Transmission Line Project (Wellington Section)

Figure 10

Preferred and Alternate Routes

7/9/2020

Jacobs

Appendix A. Siting Team

Appendix A. Beaver-Wellington 138 kV Transmission Line Project Siting Team

Name	Title	Organization	Expertise	Project Role
Nataliya Bryksenkova	Engineer IV Transmission Design	FirstEnergy	Siting	Project Siting Lead
Scott Humphrys	Supervisor, Transmission Siting	FirstEnergy	Siting	Siting Support
Ryann Loomis	Senior Environmental Scientist	Burns & McDonnell	Environmental Permitting	Environmental Lead
Shelly Haugh	Public Engagement Specialist	Burns & McDonnell	Public Engagement	Public Engagement Lead
Jonathan Schultis	Senior Project Manager	Jacobs	Siting, Land Use Planning	Jacobs Siting Lead
Julie Johnson	Environmental Planner	Jacobs	Siting, Land Use Planning	Jacobs Siting Support
Danielle Goetz	GIS Analyst	Jacobs	GIS	Jacobs GIS Lead
Ben Otto	Senior Biologist	Jacobs	Environmental Permitting	Jacobs Environmental Lead
Brian Robertson	Biologist	Jacobs	Environmental Permitting	Jacobs Environmental Support
Amy Favret	Senior Archaeologist	Jacobs	Cultural Resources/ Archaeology	Jacobs Cultural Resources Lead
Jared Tuk	Project Manager	Jacobs	Cultural Resources/ Architectural Resources	Jacobs Cultural Resources Support
Mike Frank	Senior Project Manager	Jacobs	Siting, Environmental Permitting	Jacobs Senior Technical Consultant

Appendix B. GIS Data

Appendix B. GIS Data Sources

Siting Criteria	Source	Description
Land Use		
Parcels	Lorain County Auditors	Land use determination
Residences	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Residences within the study area
Commercial Buildings	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Commercial buildings within the study area.
Land use	National Land Cover Database (2013-2016)	The NLCD (2013-2016) compiled by the Multi-Resolution Land Characteristics Consortium includes 15 classes of land cover from Landsat satellite imagery.
Conservation easements	National Conservation Easement Database (2019)	Private conservation in study areas from the National Conservation Easement Database, which is composed of voluntarily reported conservation easement information from land trusts and public agencies.
Archeological resources	Ohio Historic Preservation Office (OHPO)	Previously identified archeological resources, including those listed or eligible on the NRHP.
Architectural resources	Ohio Historic Preservation Office (OHPO)	Previously identified historic architectural resource sites and districts, including those listed or eligible on the NRHP.
Institutional uses (e.g., schools, places of worship, and cemeteries)	Environmental Systems Research Institute, Lorain County Location Based Response System (LBRS), Google Earth	Places of worship, schools, and cemeteries within the study area.
Airfield and heliports	https://www.faa.gov/ (2019)	Airfields and heliports within study areas
Existing electric transmission lines	FirstEnergy/ Burns and McDonnell Replica	Existing transmission lines within the study area.
Existing pipelines	U.S. Department of Transportation National Pipeline Mapping System	Existing pipelines within the study area.

Natural Environment		
Woodlots	Digitized from Lorain County Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth) and 2016 NLCD tree canopy	Forest within the study area.
National Hydrography Dataset (NHD) stream and waterbodies	United States Geological Survey National Hydrography Dataset (2019)	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about surface water features such as lakes, ponds, streams, rivers, springs, and wells.
National Wetlands Inventory (NWI) wetlands	United States Fish and Wildlife Services (2019)	NWI produces information on the characteristics, extent, and status of the nation’s wetlands and deepwater habitats.
Floodplains	Federal Emergency Management Agency (2019)	100-year floodplain within the study area
Public lands	The Protected Areas Database of the United States (2019)	Federal, state, and local lands in the study area

Appendix C. USFWS Information for Planning and Conservation (IPaC) and Ohio Threatened and Endangered Species Report

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Lorain County, Ohio

Local office

Ohio Ecological Services Field Office

(614) 416-8993
(614) 416-8994

4625 Morse Road, Suite 104
Columbus, OH 43230-8355

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis This species only needs to be considered if the following condition applies: • Incidental take of the northern long-eared bat is not prohibited at this location. Federal action agencies may conclude consultation using the streamlined process described at https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Endangered
Red Knot Calidris canutus rufa No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 20 to Jul 20
Dunlin Calidris alpina arcticola This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Lesser Yellowlegs Tringa flavipes
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679
Breeds elsewhere

Long-eared Owl asio otus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631
Breeds Mar 1 to Jul 15

Prairie Warbler Dendroica discolor
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Sep 10

Semipalmated Sandpiper Calidris pusilla
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds elsewhere

Short-billed Dowitcher Limnodromus griseus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480
Breeds elsewhere

Snowy Owl Bubo scandiacus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds elsewhere

Wood Thrush Hylocichla mustelina
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

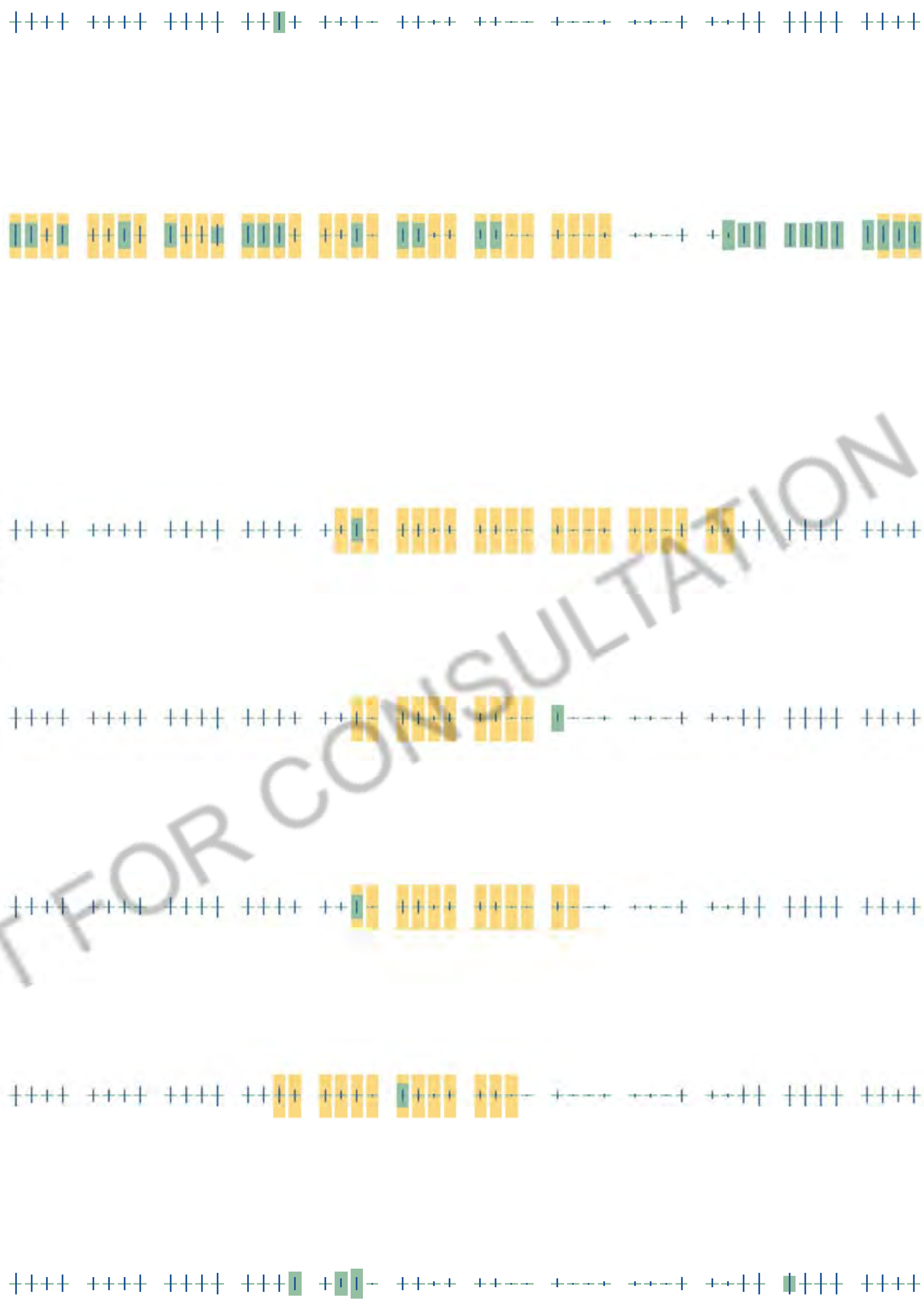
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

probability of presence | breeding season | survey effort — no data

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



American Golden-plover
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Black-billed Cuckoo
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

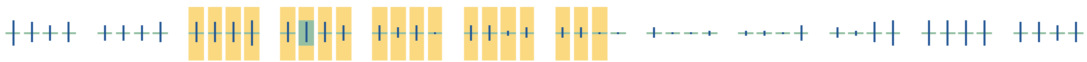
Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Cerulean Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Dunlin
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

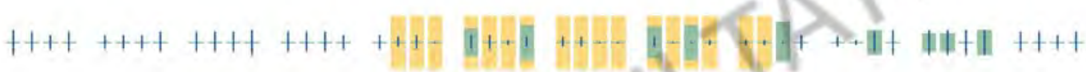
Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Long-eared Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

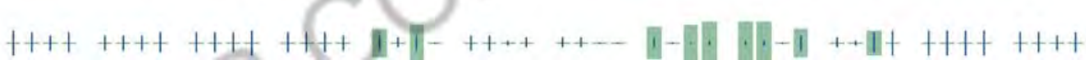


Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

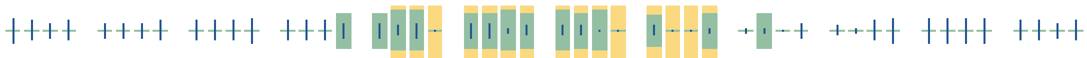


SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Snowy Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1A
- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1C
- PFO1/SS1C
- PSS1/EM1C
- PSS1C
- PFO1A

FRESHWATER POND
- PUBG
- PUBGx
- PABG
- PUBH

LAKE

- L1UBH

RIVERINE

- R2UBH
- R4SBC
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Lorain County State Listed Animal Species

Scientific Name	Common Name	Group	State Status	Federal Status
Bartramia longicauda	Upland Sandpiper	Bird	Endangered	
Chondestes grammacus	Lark Sparrow	Bird	Endangered	
Acipenser fulvescens	Lake Sturgeon	Fish	Endangered	
Lepisosteus oculatus	Spotted Gar	Fish	Endangered	
Ligumia nasuta	Eastern Pondmussel	Mollusk	Endangered	
Cygnus buccinator	Trumpeter Swan	Bird	Threatened	
Grus canadensis	Sandhill Crane	Bird	Threatened	
Ixobrychus exilis	Least Bittern	Bird	Threatened	
Tyto alba	Barn Owl	Bird	Threatened	
Notropis dorsalis	Bigmouth Shiner	Fish	Threatened	
Percina copelandi	Channel Darter	Fish	Threatened	
Ligumia recta	Black Sandshell	Mollusk	Threatened	
Obliquaria reflexa	Threehorn Wartyback	Mollusk	Threatened	
Clemmys guttata	Spotted Turtle	Reptile	Threatened	
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened	
Hemidactylium scutatum	Four-toed Salamander	Amphibian	Species of Concern	
Cistothorus platensis	Sedge Wren	Bird	Species of Concern	

Data from the Ohio Natural Heritage Database

1/8/2020

Scientific Name	Common Name	Group	State Status	Federal Status
Euphyes bimacula	Two-spotted Skipper	Butterfly	Species of Concern	
Orconectes propinquus	Great Lakes Crayfish	Crayfish	Species of Concern	
Rhinichthys cataractae	Longnose Dace	Fish	Species of Concern	
Lampsilis fasciola	Wavy-rayed Lampmussel	Mollusk	Species of Concern	
Lasmigona compressa	Creek Heelsplitter	Mollusk	Species of Concern	
Catharus guttatus	Hermit Thrush	Bird	Special Interest	
Gallinago delicata	Wilson's Snipe	Bird	Special Interest	
Setophaga magnolia	Magnolia Warbler	Bird	Special Interest	
Vermivora chrysoptera	Golden-winged Warbler	Bird	Special Interest	
Vireo solitarius	Solitary Vireo	Bird	Special Interest	
Wilsonia canadensis	Canada Warbler	Bird	Special Interest	

Appendix D. Field Review Photos

Appendix D. Field Review Photo Log

Location/Description	Photo
Location 1: Wellington Substation looking southwest from Hawley Road.	
Location 2: Existing Wellington (Brookside) 138 kV transmission line corridor looking west from South Main Street.	

Location/Description	Photo
Location 2: Existing Wellington (Brookside) 138 kV Transmission line corridor looking east from South Main Street.	
Location 3: Existing Wellington (Brookside) 138 kV Transmission line corridor looking west from Parkside Street.	

Location 3: Existing Wellington (Brookside) 138 kV Transmission line corridor looking east from Parkside Street.

Location 3: Existing Wellington (Brookside) 138 kV structure in the middle of Parkside Street looking north.

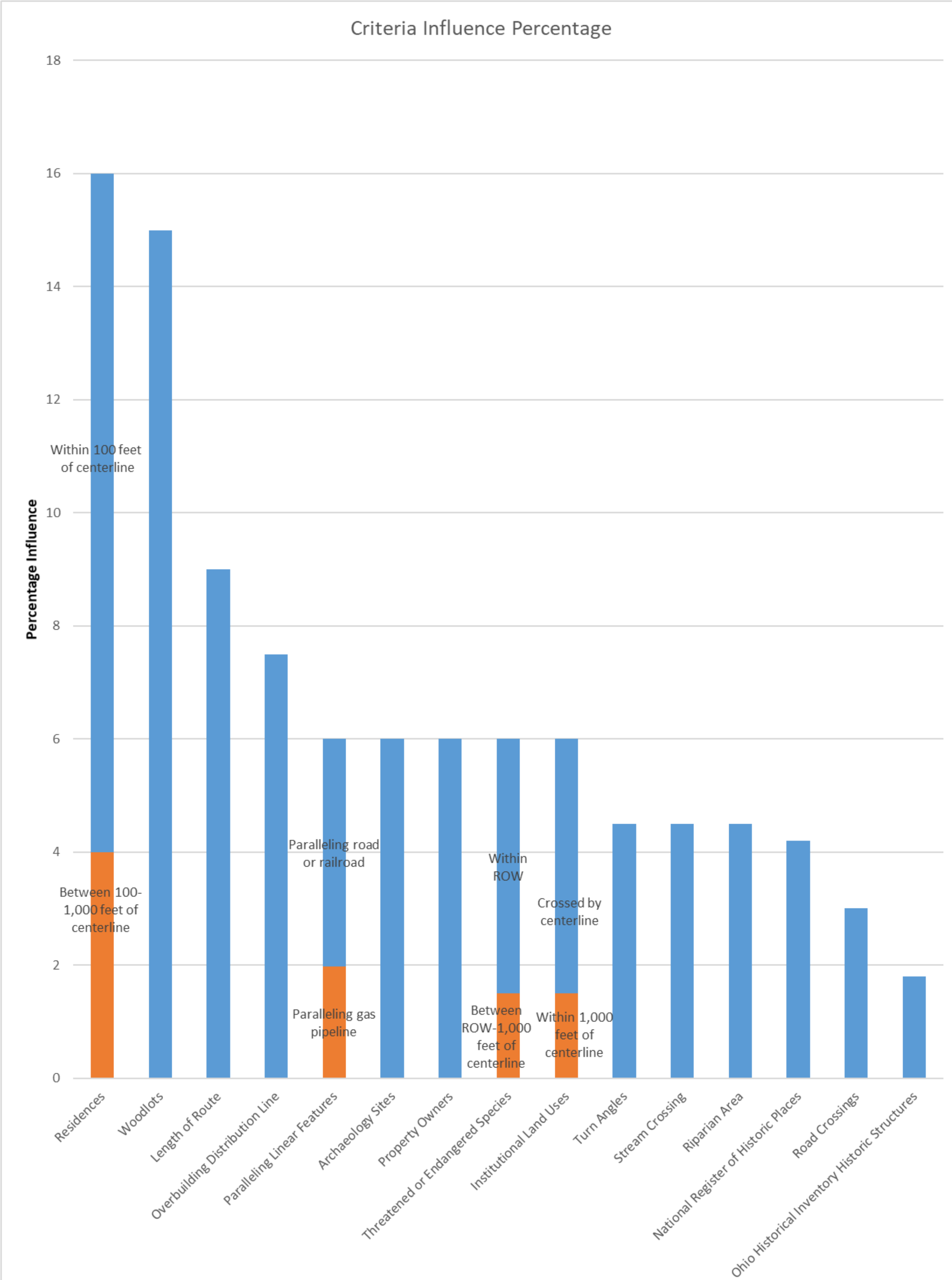
Location 4: Existing Wellington (Brookside) 138 kV Transmission line corridor looking west from Wellington Upper Reservoir parking lot.

Appendix E. Evaluation Criteria

Appendix E. Route Selection Study Evaluation Criteria

Criteria	Source	Rational
Ecological		
Area of Woodlots within right-of-way (acres)	2016 National Land Cover Data tree canopy and digitized from Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Trees that would require clearing. OPSB requires report of woodlots, potential loss of habitat, and cost for clearing.
Area of National Wetlands Inventory (NWI) within right-of-way (acres) Delineated wetlands	U.S. Fish and Wildlife Service Jacobs Engineering Group Inc.	Impacts to wetlands triggers additional construction, maintenance, and permitting cost and schedule issues. Agencies seek to avoid, minimize, and then mitigate for impacts to wetlands.
Number of NHD stream crossings Delineated streams	U.S. Geological Survey (USGS) National Hydrography Dataset Jacobs Engineering Group Inc.	May require additional permitting and consultation with Ohio Department of Natural Resources (ODNR).
Number of T&E species within right-of-way and between ROW and 1,000 feet*	ODNR, Division of Wildlife (Ohio Natural Heritage Program)	T&E species and habitat are reviewed by ODNR and OPSB. It is better to avoid known locations in the siting study.
Cultural / Land Use		
National Register of Historic Places (NRHP) within 1,000 feet*	Ohio Historic Preservation Office (OHPO)	OHPO can consider transmission an aesthetic impact to historic structures. Avoid where possible.
Known archaeology sites within 100 feet*	Ohio Historic Preservation Office (OHPO)	Avoidance of archaeological sites minimizes the need for additional archaeological work.
Ohio Historical Inventory structures within 1,000 feet	Ohio Historic Preservation Office (OHPO)	OHPO can consider transmission an aesthetic impact to historic structures. Avoid where possible.
Number of residences within 100 feet and between 100 and 1,000 feet	Digitized from Ohio Statewide Imagery Program (OSIP) Flown 2017 and Google (Maps, Street view, Earth)	Residences and residential areas are avoided where possible; being further away from residences is preferred.
Properties owners crossed by right-of-way	Lorain County Auditor	A lower number of properties crossed is preferred for schedule, cost, and public impact considerations.
Linear feet of institutional land uses crossed* and within 1,000 feet*	Environmental Systems Research Institute (ESRI)	Potential viewshed impacts and required to report on by OPSB.
Technical		
Centerline railroad crossing	ESRI and aerial photograph	Railroad crossing permit during construction.
Turn angles greater than or equal to 45 degrees	Developed from geographic information system (GIS) data	Requires new type of structure and potential for guying.
Length of segment paralleling gas pipeline*	U.S. Department of Transportation National Pipeline Mapping System	Follows existing disturbed corridor and limits fragmentation of property.
Length of segment paralleling road or railroad corridor (in feet)	ESRI	Follows existing disturbed corridor and limits fragmentation of property.
Length of segment paralleling electric transmission line (in feet)	FirstEnergy/ Burns and McDonnell Replica	Follows existing disturbed corridor and limits fragmentation of property.
Length of route (in miles)	Developed from GIS Data	The shorter the length the less to potentially impact and less cost.

*Criteria considered but not within study area for this Project.


Criteria Influence Percentage
Percentage Influence
18
16
14
12
10
8
6
4
2
0
Within 100 feet of centerline
Between 100-1,000 feet of centerline
Paralleling road or railroad
Paralleling gas pipeline
Within ROW
Between ROW-1,000 feet of centerline
Crossed by centerline
Within 1,000 feet of centerline
Residences
Woodlots
Length of Route
Overbuilding Distribution Line
Paralleling Linear Features
Archaeology Sites
Property Owners
Threatened or Endangered Species
Institutional Land Uses
Turn Angles
Stream Crossing
Riparian Area
National Register of Historic Places
Road Crossings
Ohio Historical Inventory Historic Structures

Appendix F. Weighted Scoring Tables

Alternative Route Evaluation

Route	Study Segments	Ecology									
		Area of Woodlots within ROW (in acres)	Normalized Score for Area of Woodlots within ROW	Area of NWI within ROW (in acres)	Normalized Score for Area of NWI within ROW	NHD Stream Crossing	Normalized Score for NHD Stream Crossing	Federal or State Endangered or Threatened Species Areas within ROW	Normalized Score for Federal or State Endangered or Threatened Species Areas within ROW (weighted 75%)	Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft	Normalized Score for Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft (weighted 25%)
Route 1	25-26-28	43.38	100	6.28	100	12	100	0	-	0	-
Route 2	25-26-27	34.28	62	4.84	72	11	89	0	-	0	-
Route 3	23-22-21-18-16-1	29.74	43	2.44	25	8	56	0	-	0	-
Route 4	23-19-17-16-1	29.70	43	2.09	18	7	44	0	-	0	-
Route 5	23-19-17-16-13-11-10-9	22.89	14	1.17	0	3	0	0	-	0	-
Route 6	23-19-17-16-13-11-10-7-6-5	19.42	0	1.29	2	5	22	0	-	0	-
	MIN	19.42	0	1.17	0	3	0	0	0	0	0
	MAX	43.38	100	6.28	100	12	100	0	0	0	0
	RANGE	23.96	100	5.11	100	9	100	0	0	0	0

ROW = 200 ft.

Route	Study Segments	Cultural/Land Use													
		National Register of Historic Places within 1,000-ft of centerline	Normalized Score for National Register of Historic Places within 1,000-ft of centerline	Known Archaeology Sites within 100-ft of centerline	Normalized Score for Known Archaeology Sites within 100-ft of centerline	Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Normalized Score for Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Residences within 100-ft of centerline	Normalized Score for Residences within 100-ft of centerline (weighted 75%)	Residences between 100 and 1,000-ft of centerline	Normalized Score for Residences between 100 and 1,000-ft of centerline (weighted 25%)	Property Owners Crossed by ROW	Normalized Score for Property Owners Crossed by ROW	Linear Feet of Institutional Land Uses Crossed by centerline**	Normalized Score for Linear Feet of Institutional Land Uses Crossed by centerline (weighted 75%)	Institutional Land Uses within 1,000-ft of centerline**	Normalized Score for Institutional Land Uses within 1,000-ft of centerline (weighted 25%)
Route 1	25-26-28	1	0	0	-	1	0	0	0	14	0	28	0	0	-	1	0
Route 2	25-26-27	1	0	0	-	1	0	7	58	28	2	37	27	0	-	1	0
Route 3	23-22-21-18-16-1	1	0	0	-	1	0	5	42	181	22	53	76	0	-	2	25
Route 4	23-19-17-16-1	1	0	0	-	1	0	2	17	162	20	29	3	0	-	1	0
Route 5	23-19-17-16-13-11-10-9	1	0	0	-	1	0	8	67	198	25	61	100	0	-	1	0
Route 6	23-19-17-16-13-11-10-7-6-5	1	0	0	-	1	0	9	75	201	25	53	76	0	-	1	0
	MIN	1	0	0	0	1	0	0	0	14	0	28	0	0	0	1	0
	MAX	1	0	0	0	1	0	9	75	201	25	61	100	0	0	2	25
	RANGE	0	0	0	0	0	0	9	75	187	25	33	100	0	0	1	25

**Institutional land use includes schools, churches, and hospitals

Route	Study Segments	Technical														
		Centerline Road Crossings	Normalized Score for Centerlin Road Crossings	Turn Angles Greater than or Equal to 45 Degrees	Normalized Score for Turn Angles Greater than or Equal to 45 Degrees	Length of Segment Paralleling Exisitng Gas Line ROW	Normalized Score for Length of Segment Paralleling Exisitng Gas Line ROW (weighted 33%)	Length of Segment Paralleling Road or Railroad Corridor (in feet)	Normalized Score for Length of Segment Paralleling Road or Railroad Corridor (weighted 67%)	Length of Segment Paralleling Existing Transmission Line (in feet)	Normalized Score for Length of Segment Paralleling Existing Transmission Line	Length of Route (in miles)	Normalized Score for Length of Route	Normalized Ecological Score	Normalized Cultural/Land Use Score	Normalized Technical Score	Final Score	Rank
Route 1	25-26-28	5	50	3	75	0	-	0	67	30847	0	5.84	100	24.0	0.0	17.9	41.9	5
Route 2	25-26-27	7	100	3	75	0	-	10771	17	17421	80	5.34	70	16.5	11.3	19.7	47.5	6
Route 3	23-22-21-18-16-1	5	50	1	25	0	-	7018	34	14988	95	4.41	13	10.1	16.3	13.0	39.4	3
Route 4	23-19-17-16-1	3	0	0	0	0	-	1258	61	22284	51	4.19	0	9.3	6.0	7.5	22.8	1
Route 5	23-19-17-16-13-11-10-9	3	0	2	50	0	-	14368	0	14136	100	5.12	56	2.2	20.6	14.8	37.6	2
Route 6	23-19-17-16-13-11-10-7-6-5	4	25	4	100	0	-	9615	22	14136	100	5.26	65	1.1	20.5	19.9	41.6	4
	MIN	3	0	0	0	0	-	0	0	14136	0	4.19	0					
	MAX	7	100	4	100	0	-	14368	67	30847	100	5.84	100					
	RANGE	4	100	4	100	0	-	14368	67	16711	100	1.65	100					

Adjusted Alternative Route Evaluation

Route	Study Segments	Ecology									
		Area of Woodlots within ROW (in acres)	Normalized Score for Area of Woodlots within ROW	Area of Delineated Wetlands within ROW (in acres)	Normalized Score for Area of NWI within ROW	Delineated Streams crossed	Normalized Score for NHD Stream Crossing	Federal or State Endangered or Threatened Species Areas within ROW	Normalized Score for Federal or State Endangered or Threatened Species Areas within ROW (weighted 75%)	Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft	Normalized Score for Number of Federal or State Endangered or Threatened Species Areas between ROW and 1,000-ft (weighted 25%)
Alternative 1 (Alternate)	-	7.33	100	3.42	0	7	0	0	-	0	-
Alternative 2 (Preferred)	-	2.42	0	4.97	100	14	100	0	-	0	-
	MIN	2.42	0	3.42	0	7	0	0	0	0	0
	MAX	7.33	100	4.97	100	14	100	0	0	0	0
	RANGE	4.91	100	1.55	100	7	100	0	0	0	0

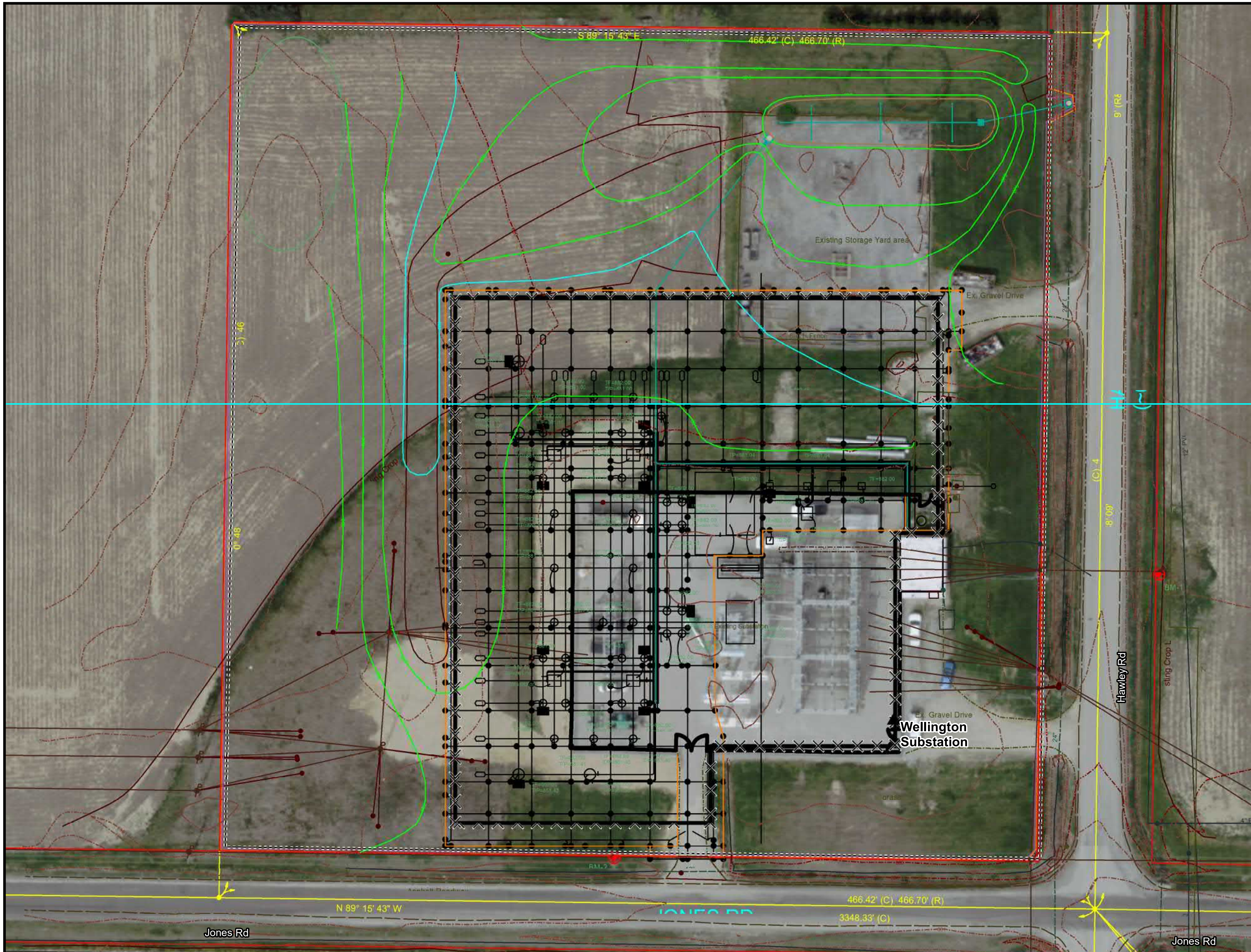
ROW = 65 ft.

Route	Study Segments	Cultural/Land Use															
		National Register of Historic Places within 1,000-ft of centerline	Normalized Score for National Register of Historic Places within 1,000-ft of centerline	Known Archaeology Sites within 100-ft of centerline	Normalized Score for Known Archaeology Sites within 100-ft of centerline	Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Normalized Score for Ohio Historical Inventory Historic Structures within 1,000-ft of centerline	Residences within 100-ft of centerline	Normalized Score for Residences within 100-ft of centerline (weighted 75%)	Residences between 100 and 1,000-ft of centerline	Normalized Score for Residences between 100 and 1,000-ft of centerline (weighted 25%)	Property Owners Crossed by ROW	Normalized Score for Property Owners Crossed by ROW	Linear Feet of Institutional Land Uses Crossed by centerline**	Normalized Score for Linear Feet of Institutional Land Uses Crossed by centerline (weighted 75%)	Institutional Land Uses within 1,000-ft of centerline**	Normalized Score for Institutional Land Uses within 1,000-ft of centerline (weighted 25%)
Alternative 1 (Alternate)	-	1	0	0	-	1	0	2	75	131	25	20	0	0	-	0	-
Alternative 2 (Preferred)	-	1	0	0	-	1	0	0	0	19	0	24	100	0	-	0	-
	MIN	1	0	0	0	1	0	0	0	19	0	20	0	0	0	0	0
	MAX	1	0	0	0	1	0	2	75	131	25	24	100	0	0	0	0
	RANGE	0	0	0	0	0	0	2	75	112	25	4	100	0	0	0	0

**Institutional land use includes schools, churches, and hospitals

Route	Study Segments	Technical															
		Centerline Road Crossings	Normalized Score for Centerlin Road Crossings	Turn Angles Greater than or Equal to 45 Degrees	Normalized Score for Turn Angles Greater than or Equal to 45 Degrees	Length of Segment Paralleling Exisitng Gas Line ROW	Normalized Score for Length of Segment Paralleling Exisitng Gas Line ROW (weighted 33%)	Length of Segment Paralleling Road or Railroad Corridor (in feet)	Normalized Score for Length of Segment Paralleling Road or Railroad Corridor (weighted 67%)	Length of Segment Paralleling/ Overbuilding Existing Transmission Line (in feet)	Normalized Score for Length of Segment Paralleling/ Overbuilding Existing Transmission Line	Length of Route (in miles)	Normalized Score for Length of Route	Normalized Ecological Score	Normalized Cultural/Land Use Score	Normalized Technical Score	Final Score	Rank
Alternative 1 (Alternate)	-	5	0	0	0	0	-	2815.71	67	22165	100	4.19	0	15.0	16.0	11.5	42.5	2
Alternative 2 (Preferred)	-	5	0	6	100	0	-	3521	0	31513	0	6.02	100	9.0	6.0	13.5	28.5	1
	MIN	5	0	0	0	0	-	2816	0	22165	0	4.19	0					
	MAX	5	0	6	100	0	-	3521	67	31513	100	6.02	100					
	RANGE	0	0	6	100	0	-	705	67	9348	100	1.82	100					

Appendix 5-1
Wellington Substation Expansion Drawings



LEGEND:

Wellington Substation Expansion used in report

- Proposed Expansion
- Existing Fenceline
- Possible Limits of Disturbance

BASE MAP SOURCE:
Esri World Imagery
Coordinate System: State Plane
Ohio North FIPS 3401 Feet
Datum: NAD 1983
Scale: 1:24,000
11/18/2020

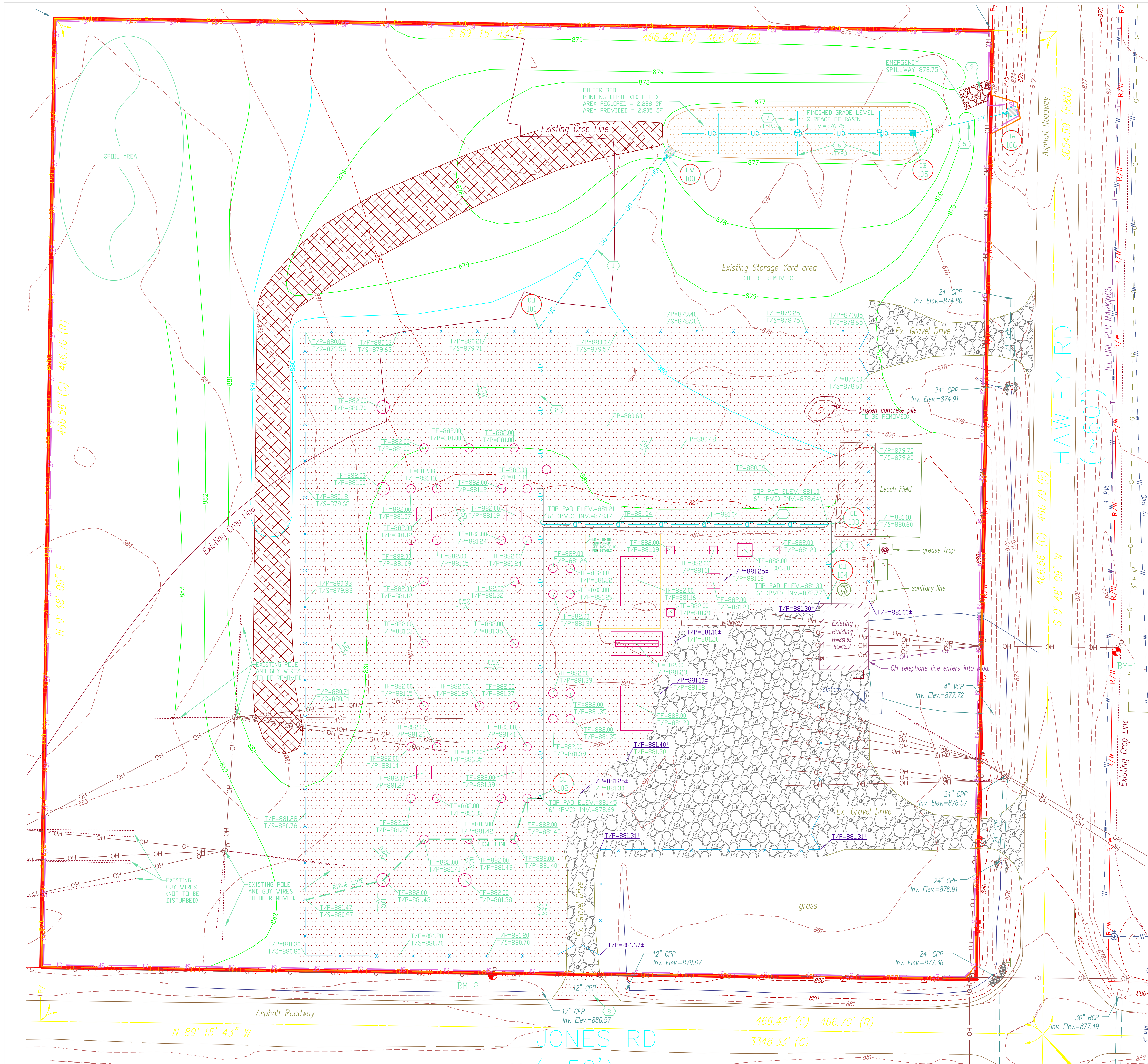
ATSI
American Transmission Systems, Inc.
A subsidiary of FirstEnergy Corp.

Beaver-Wellington 138 kV Transmission Line Project (Wellington Substation)

SUBSTATION EXPANSION OVERVIEW

0 50 100
FEET

\\dc1vs01\GISProj\F\FirstEnergy\Beaver_Wellington_138KV\Maps\Working\Substation_Expansion\Wellington_Substation_RetentionBasin.mxd



STORM PIPES & CONNECTIONS

1. 100 L.F. 6" STORM (SOLID PVC) @ 0.35% PER ODOT ITEM 605.
2. 220 L.F. 6" UNDERDRAIN (PERFORATED PVC) @ 0.35% PER ODOT ITEM 605. PIPE SHALL BE WRAPPED IN GEOTEXTILE FABRIC, TYPE A PER ODOT ITEM 712.09.
3. 134 L.F. 6" UNDERDRAIN (PERFORATED PVC) @ 0.35% PER ODOT ITEM 605.
4. 38 L.F. 6" UNDERDRAIN (PERFORATED PVC) @ 0.35% PER ODOT ITEM 605.
5. 46 L.F. 6" STORM (SOLID PVC) @ 1.00% PER ODOT ITEM 605.
6. PROPOSED CLEANOUT, SEE SHEET 0-471-04-07. RIM= 876.75, INV.=875.00.
7. 165 L.F. (TOTAL LENGTH UNDER FILTER BED) 6" UNDERDRAIN (PERFORATED PVC) @ 0.00%, INCLUDE ALL FITTINGS AND ASSOCIATED PER ODOT ITEM 605.
8. APRON TO BE RESTORED, ADD NEW STONE TO DEFINE THE LIMITS.
9. PROPOSED 14'L X 10'W X 18"T ODOT 601.09 TYPE D ROCK CHANNEL PROTECTION WITH ODOT 712.09 TYPE B GEOTEXTILE FABRIC WRAP.

PROPOSED STRUCTURES

STRCT. ID	STRUCTURE DETAILS
HW 100	PROPOSED CONCRETE HEADWALL WITH TILED CONCRETE MAT (ODOT STD DRAWING DM-1.1) INV. AT 6" (NE)=877.50
CO 101	PROPOSED STORM CLEAN OUT (SEE DETAIL, SHEET O-471-04-06) RIM=880.31 INV. 6" (PVC)=877.85
CO 102	PROPOSED STORM CLEAN OUT (SEE DETAIL, SHEET O-471-04-06) RIM=880.94 INV. 6" (PVC)=878.62
CO 103	PROPOSED STORM CLEAN OUT (SEE DETAIL, SHEET O-471-04-06) RIM=881.10 INV. 6" (PVC)=878.64
CO 104	PROPOSED STORM CLEAN OUT (SEE DETAIL, SHEET O-471-04-06) RIM=881.30 INV. 6" (PVC)=878.77
CB 105	PROPOSED ODOT CATCH BASIN RIM=877.75 6" INV. (W,NE)=874.96
HW 106	PROPOSED CONCRETE HEADWALL WITH TILED CONCRETE MAT (ODOT STD DRAWING DM-1.1) INV. 6" (NE)=874.50

WATER QUALITY VOLUME CALCULATIONS

Ohio EPA Bioretention Calculations

Project Name: Wellington SS
Project #: 2019093.33
Project Location: Wellington, Ohio
Date: 9/9/20

Water Quality Volume Sizing (Based on Ohio NPDES requirements)

Total Area At (acres)	Impervious Area Ai (acres)	i=Ai/At	*Composite C	Depth of Rainfall P (in)
4.42	1.04	0.24	0.19	0.75

Water Quality Volume, WQv	=	P	*	C	*	A/12
	=	0.75	*	0.19	*	0.368
	=	0.05				Ac-ft
	=	2288				ft^3

*Ohio EPA will allow the use of the ASCE "mixed-use" formula to calculate a weighted C-coefficient: $C=0.858i^3-0.78i^2+0.774i+0.04$

Impervious Area %	=	23.53%	
Filter Bed Area Based on Impervious Area	=	NULL	ft^2
Final Filter Bed Area	=	2288	ft^2

Note: The filter bed areas are calculated assuming 1' of ponding depth. The WQv is required to be stored above the surface of the cell, therefore depths less than 1' will require a much larger surface area for the bioretention cell.

Basin Elevation (ft)
876.75

Filter Media Thickness (ft)	
Basin	2.00

Minimum Elevations (ft)	
Riser:	877.75
Top Of Sand:	874.75
Top Of Pea Gravel:	874.50
Top Of Gravel:	874.25
Underdrain Inv. (6"):	873.50
Bottom Of Gravel:	873.25

Sediment Storage Required (ft^3):	458
Bed Sediment Storage (ft^3)	0
Filter Bed Perimeter (ft):	270
Side Slope (x:1):	5
Bed Perimeter Sed. Storage (ft^3):	675
Sediment Storage Provided (ft^3):	675

VOLUME:
(FROM EXISTING GRADE TO FINISHED GRADE)

TOTAL CUT = 2,725 CY (INCLUDES SOD AND TOPSOIL).

TOTAL FILL = 292 CY (INCLUDES NON-STRUCTURAL AND STRUCTURAL).

NOTE:
SUBSTATION PAD AND DRIVE STONE VOLUME PER TYPICAL SECTIONS ARE NOT INCLUDED WITHIN THESE NUMBERS

PARCEL AREA TABLE	
OHIO EDISON COMPANY	5.00 ACRES

BENCHMARKS:

STATE PLANE GRID NORTH, NAD 83 (2011), GEOID 12B, OHIO NORTH ZONE. TIED BY GPS TO THE O.D.O.T. VRS.

ELEVATIONS ARE NAVD 88.

BENCHMARK #1 - BENCH TIE IN STRAIN POLE ELEVATION=880.026

BENCHMARK #2 - BENCH TIE IN POLE LMRE81199 ELEVATION=882.05

EXISTING DITCH AND CULVERT PIPES CONDITION NOTE:

CONTRACTOR SHOULD INSPECT THE CONDITION OF ALL EXISTING CULVERT PIPES, SHOULD BE REPLACED IF NECESSARY. DITCH AND CULVERT PIPES SHOULD BE CLEAN TO HAVE FREE FLOW OF STORM WATER.

LEACH FIELD RELOCATION NOTES:

1. CONTRACTOR TO RELOCATE LEACH FIELD OUTSIDE PROPOSED SUBSTATION PAD PER HEALTH DEPARTMENT AND OTHER APPLICABLE REGULATIONS.
2. ALL EXISTING LEACH FILED PIPES (TO REMAIN) SHALL BE PROTECTED AND RESTORED FOR ANY DAMAGE.
3. CONTRACTOR SHALL INSTALL FILTER FABRIC BETWEEN PROPOSED STONE PAD AND LEACH FIELD AREA TO AVOID ANY FILTRATION FROM SUBSTATION PAD INTO LEACH FIELD.

NORTH

0 10 20 40

1"=20'
HORIZONTAL SCALE IN FEET

LEGEND

- EXISTING RR SPIKE FOUND AS NOTED
- EXISTING IRON PIN FOUND AS NOTED
- EXISTING CAPPED IRON PIN FOUND AS NOTED
- EXISTING MAG NAIL FOUND AS NOTED
- EX. POWER POLE
- sep tnk — EXISTING SEPTIC TANK
- EXISTING GUY WIRE
- EXISTING CONCRETE PAD/AREA/SIDEWALK
- EXISTING RIP RAP
- P/L — EXISTING PROPERTY LINE
- R/W — EXISTING RIGHT OF WAY LINE
- EXISTING CENTER LINE
- OH — OH — EXISTING OVERHEAD UTILITY LINES
- EXISTING UNDERGROUND STORM LINES
- SAN — EXISTING UNDERGROUND SANITARY LINES
- W — EXISTING UNDERGROUND WATER LINES
- 880 — EX. MAJOR TOPOGRAPHIC CONTOUR
- 881 — EX. MINOR TOPOGRAPHIC CONTOUR
- BM-# — BENCHMARK
- EXISTING SWALE/ DITCH
- LOD — LOD — PERMIT LIMITS OF DISTURBANCE
- TOTAL PROJECT SITE BOUNDARY
- x — x — PROPOSED FUTURE FENCE
- 880 — PROPOSED MAJOR CONTOUR
- 881 — PROPOSED MINOR CONTOUR
- ST — ST — PROPOSED STORM PIPE
- PROPOSED PRECAST REINFORCED CONCRETE OUTLET
- TIED CONCRETE BLOCK MAT, TYPE 1
- T/P=0000.00± / T/P=0000.00 — EXISTING SPOT ELEVATION @ TOP OF EX. STONE PAD PROPOSED ELEVATION @ TOP OF FINISHED STONE FOR SUBSTATION PAD
- TF=882.00 / T/P=0000.00 — TOP OF CONCRETE FOUNDATION ELEVATION = 882.00 TOP OF STONE PAD ELEVATION (EXPOSURE 5"-16"MAX.)
- T/P 0000.00 / T/S 0000.00 — PROPOSED ELEVATION @ TOP OF FINISHED STONE FOR SUBSTATION PAD; PROPOSED ELEVATION @ TOP OF SUBGRADE, SEE SHEET O-471-04-06 FOR STONE SECTION
- 0.0% — PROPOSED TOP OF PAD SLOPE
- T/P=0000.00± — EXISTING SPOT ELEVATION @ TOP OF EX. STONE PAD
- PROPOSED EROSION CONTROL BLANKET ROLLMAX ERONET S150 OR APPROVED EQUAL
- PROPOSED SUBSTATION PAD, SEE SHEET O-471-04-06 FOR DETAIL.
- EXISTING SUBSTATION PAD
- EXISTING LEACH FIELD TO BE RELOCATED OUTSIDE OF PROPOSED SUBSTATION PAD (SEE LEACH FIELD RELOCATION NOTES THIS SHEET)

BILL OF MATERIALS		
QUANTITY	UNIT	MATERIAL
2,725	CY	CUT-EARTHWORK
292	CY	FILL-EARTHWORK
557	LF	6" PERFORATED PVC PIPE
146	LF	6" SOLID PVC PIPE
3	EA	6" WYE BEND FITTING
4	EA	6" CLEAN OUT
2	EA	CONCRETE HEADWALL FOR 6" PVC PIPE
1	EA	ODOT CATCH BASIN
420	CY	#4 WASHED CRUSHED LIMESTONE
540	CY	#57 WASHED CRUSHED LIMESTONE
525	LF	SILT FENCE/COMPOST SOCK

CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR ALL REQUIRED MATERIALS TO PERFORM THE WORK HEREIN.

GENERAL NOTES:

1. SEE SHEET O-471-04-07 TO O-471-04-08 FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
2. CONTRACTOR TO PROVIDE STAGING AREA INCLUDING PORTA POTTY, FUELING AREA, AND LAYDOWN AREA WITHIN LIMITS OF DISTURBANCE AND PROVIDE ALL NECESSARY EROSION CONTROL MEASURES.
3. CONTRACTOR TO ENSURE STREET REMAINS FREE OF ALL DEBRIS AND TRACKED MATERIAL AT ALL TIMES THROUGHOUT CONSTRUCTION. STREET SWEEPING AND ALL NECESSARY MEASURES SHALL BE DONE DAILY.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD LOCATE ALL EXISTING STORM INLETS AROUND THE CONSTRUCTION AREA AND ENTRANCE AND INSTALL THE PROPER SWPP MEASURES. AREAS SHALL INCLUDE, BUT NOT LIMITED TO, JONES ROAD AND HAWLEY ROAD INLETS, EXISTING SUBSTATION INLETS, AND/OR DRAINAGE DITCHES.

CONSTRUCTION FENCING NOTES:

1. CONTRACTOR SHALL ERECT CONSTRUCTION FENCING AROUND WORK AREA TO DETER PEDESTRIANS FROM ENTERING THE WORK ZONE.
2. THE LIMITS OF DISTURBANCE SHALL BE POSITIONED AS FAR AS POSSIBLE AWAY FROM THE EASTERN AND SOUTHERN DRAINAGE WAY/DITCH. NO LOOSE CONSTRUCTION MATERIAL SHALL BE STORED OR KEPT NEAR THE DITCH AREA. ALL MATERIALS SHALL BE SECURED SUCH THEY ARE NOT ABLE TO BE DISPLACED OR WASHED AWAY DURING A FLOOD EVENT.

TEMPORARY SOIL STOCKPILE NOTES:

1. EXCESS SOIL STOCKPILES THAT WILL NOT BE USED ON THE SITE MUST BE REMOVED WITHIN 48 HOURS.

STORM PIPE MATERIAL NOTES:

1. ALL STORM SEWERS AND PIPES 12-INCH AND SMALLER SHALL BE PVC SDR35, PER ASTM D3034.

GRADING NOTES:

1. THE PROJECT SUBSTATION SITE IS CURRENTLY A GRAVEL PAD SURROUNDED BY GRASS. THE GRAVEL PAD WILL BE EXPANDED. THE PROPOSED USE FOR THE PROJECT SUBSTATION SITE IS A NEW ELECTRICAL SUBSTATION. THE TOTAL PROPERTY AREA IS 5.00 ACRES. THE TOTAL ADDITIONAL STONE SURFACE AFTER CONSTRUCTION IS ESTIMATED TO BE 1.04 ACRES. THE TOTAL DISTURBANCE IS 4.42 ACRES.
2. PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISHED GRADE. TOP OF STONE FOR SUBSTATION PAD IS REFERENCED AS FINISHED GRADE. SEE DETAILS ON SHEET O-471-04-06. EROSION CONTROL MATTING SHALL BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER AND EMBANKMENTS OF DETENTION/WATER QUALITY BASIN. BLANKETS SHALL BE PROPOSED ROLLMAX VMAX SC250 PERMANENT EROSION CONTROL MATTING. CONTRACTOR SHALL INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
3. THE CONTRACTOR SHALL IDENTIFY AND STAKE THE LIMITS OF DISTURBANCE AND THE PROPERTY BOUNDARY.
4. IN GENERAL, INLET PROTECTION WHERE APPLICABLE AND COMPOST FILTER SOCKS SHALL BE PLACED AROUND THE DOWNSLOPE PERIMETER OF DISTURBED AREAS, DOWN GRADIENT OF POLE INSTALLATIONS, AND AROUND STOCKPILE AREAS AND SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURE RECOMMENDATIONS.
5. REFER TO SOIL BORE DATA FOR SUBSURFACE CONDITIONS (SEE SHEET GEOTECHNICAL ENGINEERING REPORT BY GPD GROUP DATED SEPTEMBER 17, 2019).
6. GROUND SURFACE WITHIN THE GRADING LIMITS OF DISTURBANCE SHALL BE CLEARED OF ALL ORGANIC TOPSOIL, STUMPS, BRUSH, DEBRIS, AND SURFACE VEGETATION. STUMPS AND ROOTS LARGER THAN 2" IN DIAMETER SHALL BE COMPLETELY GRUBBED AND REMOVED. MATTED ROOTS SHALL BE REMOVED REGARDLESS OF SIZE. SURFACE VEGETATION SHALL BE REMOVED COMPLETE WITH ROOTS TO A DEPTH OF NOT LESS THAN 4" BELOW THE GROUND SURFACE. CLEARED TOPSOIL SHALL BE STOCKPILED AS APPROVED BY THE OWNER PRIOR TO INITIATION OF EARTHWORK ACTIVITIES FOR RESPREADING AND REMOVE EXCESS FROM SITE. CONTRACTOR ACTIVITIES SHALL BE LIMITED TO BE WITHIN LIMITS OF DISTURBANCE.
7. ORGANIC TOPSOIL WHICH IS FREE OF TRASH, VEGETATION, ROCKS, AND ROOTS SHALL BE STOCKPILED FOR LATER USE IN AREAS THAT WILL BE SEEDED AND REMOVE EXCESS FROM SITE.
8. FILL OR CUT SLOPES SHALL BE NO STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL.
9. FILL MATERIAL SHALL CONFORM TO THE OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS AND THE GEOTECHNICAL REPORT. IF ONSITE CUT MATERIAL DOES NOT MEET THESE SPECIFICATIONS, THEN SUITABLE FILL MATERIAL MUST BE OBTAINED FROM AN OFFSITE LOCATION.
10. FILL AND EMBANKMENTS SHOULD BE PLACED ON THE APPROVED SUBGRADE IN CONTROLLED LIFTS NOT EXCEEDING 8 INCHES LOOSE MEASURE, WITH EACH LIFT COMPACTED TO A STABLE CONDITION, AND TO A MINIMUM OF 98% MAXIMUM DRY DENSITY PER ASTM D-698 AT A MOISTURE CONTENT WITHIN 1.5% OF OPTIMUM FOR COHESIVE OR SILT BORROW. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT AND RETAIN A QUALIFIED SOILS ENGINEER REGISTERED WITHIN THE STATE TO ENSURE COMPLIANCE WITH THE GEOTECHNICAL REPORT, MAKE GEOTECHNICAL RECOMMENDATIONS BASED ON FIELD CONDITIONS, AND ENSURE THAT ALL SHORING AND DEWATERING MEANS AND METHODS WILL NOT COMPROMISE THE STABILITY OF EXISTING OR PROPOSED FOOTINGS/FOUNDATIONS. THE REQUIREMENT TO HIRE AN INDEPENDENT GEOTECHNICAL ENGINEER MAY BE WAIVED IF AN OWNER HIRED GEOTECHNICAL ENGINEER IS ONSITE. THE OWNER RESERVES THE RIGHT TO REQUEST COMPACTION REPORTS PREPARED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE SUBSTATION PAD AREA HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE SOILS REPORT. NOTIFY PROJECT CONSTRUCTION MANAGER IF ANY UNSUITABLE SOILS ARE FOUND.
11. ALL GROUND SURFACE AREAS THAT HAVE BEEN EXPOSED OR LEFT BARE AS A RESULT OF CONSTRUCTION AND ARE TO ROUGH AND/OR FINISH GRADE SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF OBTAINING ROUGH AND/OR FINISH GRADE, PER ODNR AND ENVIRONMENTAL PROTECTION STORMWATER REQUIREMENTS.
12. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS THAT HAS BEEN DEPOSITED IN EXISTING DRAINAGE FEATURES, ROADWAYS, AND OTHER OFFSITE AREAS.
13. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND OTHER WASTE MATERIALS FROM THE CONSTRUCTION AREA. OPEN BURNING IS NOT PERMITTED AT THE SITE.
14. THE CONTRACTOR SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE.
15. CONTRACTOR SHALL FOLLOW SEQUENCE OF CONSTRUCTION PER SWPP PLANS.
16. CONTRACTOR SHALL CUT HORIZONTAL BENCHES INTO EXISTING GROUND SURFACE PRIOR TO PLACEMENT OF NEW FILL TO PREVENT FORMATION OF A POTENTIAL SLIP PLANE.
17. ALL SURFACES CUT TO SUBGRADE OR SUBGRADE TO RECEIVE FILL SHALL BE PROOF ROLLED UNDER DIRECTION OF THE ONSITE GEOTECHNICAL ENGINEER AND IN ACCORDANCE WITH THE GEOTECNICAL REPORT.
18. FOLLOWING GRADING OF SUBSOIL TO SUBGRADE ELEVATIONS THE CONTRACTOR SHALL PLACE TOPSOIL TO A 4" DEPTH IN ALL DISTURBED AREAS WHICH ARE OUTSIDE OF THE SUBSTATION, SEE SHEET O-471-04-08 FOR SEEDING NOTES. SMOOTHLY FINISH GRADE TO MEET SURROUNDING LAWN AREAS AND ENSURE POSITIVE DRAINAGE. STOCKPILED TOPSOIL SHALL BE SCREENED PRIOR TO RESPREADING. TOPSOIL SHALL BE FREE OF SUBSOIL, DEBRIS, BRUSH AND STONES LARGER THAN 1" IN ANY DIMENSION. ROCK HOUNDING IN PLACE WILL NOT BE PERMITTED. ALL EXCESS TOPSOIL AND SUBSOIL SHALL BE LEGALLY DISPOSED OF OFF SITE.
19. CONSTRUCTION OF THE STATION SHALL COMPLY WITH THE LATEST VERSION OF THE FOLLOWING FIRSTENERGY (FE) GENERAL SPECIFICATIONS:
    FE-CONST-1, SUBSTATION CONSTRUCTION
    FE-EROSIONCTRL-1, EROSION CONTROL AND
    OHIO DEPARTMENT OF NATURAL RESOURCES RAINWATER AND LAND DEVELOPMENT MANUAL.
20. THE PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH LORAIN COUNTY, OHIO DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION REQUIREMENTS, STANDARDS, AND SPECIFICATIONS.
21. THE CONTRACTOR SHALL FIELD-VERIFY THE LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. INFORM OWNER OF ANY DISCREPANCIES.
22. THE CONTRACTOR SHALL STAKE THE LIMITS OF DISTURBANCE AND ALERT THE UTILITIES PROTECTION SERVICE AT 1-800-362-2764 AND OTHER APPROPRIATE ENTITIES AS NECESSARY AT LEAST 2 BUSINESS DAYS BEFORE ANY EXCAVATION OR CONSTRUCTION IS INITIATED TO ARRANGE FOR UTILITY VERIFICATION & CONSTRUCTION INSPECTION SERVICES, RESPECTIVELY. INFORM OWNER OF ANY DISCREPANCIES.
23. CONTRACTOR SHALL UTILIZE A PRIVATE UTILITY LOCATING SERVICE DURING CONSTRUCTION PRIOR TO ANY EXCAVATION.
24. REMOVE ALL TOPSOIL WITHIN THE GRADING LIMITS OF DISTURBANCE. TOPSOIL SHALL BE STOCKPILED AT OWNER-DEFINED LOCATION FOR RESPREADING AND REMOVE EXCESS FROM SITE. APPROXIMATE EXISTING TOPSOIL DEPTH IS 12 INCHES (REFER TO THE GEOTECHNICAL REPORT FOR SOIL BORE DATA).
25. DO NOT USE SOD AND TOPSOIL CUT FROM PROPERTY AS STRUCTURAL FILL MATERIAL. REFER TO GENERAL SPECIFICATION FE-CONST-1.
26. PROPOSED CONTOURS SHOWN ARE FINISHED GRADE.
27. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO START OF CONSTRUCTION.
28. CONTRACTOR SHALL ADHERE TO ALL OSHA AND FIRST ENERGY MINIMUM CLEARANCE DISTANCES TO POWER LINES AT ALL TIMES.

ODOT STANDARD CONSTRUCTION DRAWINGS			
DWG. NO.	DATE	DWG. NO.	DATE
DM-1.1	01/15/16	CB-1.1	07/19/19

BY: WDB
APP: SPS
DATE:
ISSUE: Preliminary
(GPD)

FirstEnergy
Energy Delivery Technical Services

DIST. CODE:	C
SCALE:	?
SIZE:	42x30
OPERATING COMPANY	Ohio Edison [OE]
REGION	OH-CE
AREA	Lake Erie
FACILITY	WELLINGTON
TITLE	GRADING AND DRAINAGE PLAN
SAP NETWORK NO.	15067136
DOC. ID	O-471-04-05
REV.	-

RevisionNote

Appendix 6-1
List of Public Official Points of Contact

APPENDIX 6-1
Beaver-Wellington 138 kV Transmission Line Project
Officials to Be Served a Copy of the Certified Application

Lorain County

Commissioner Lori Kokoski,
President
Lorain County Commissioners
226 Middle Avenue, 4th Floor
Elyria, OH 44035

Commissioner Sharon Sweda,
Vice-President
Lorain County Commissioners
226 Middle Avenue, 4th Floor
Elyria, OH 44035

Commissioner Matt Lundy,
Lorain County Commissioners
226 Middle Avenue, 4th Floor
Elyria, OH 44035

Mr. Ken Carney, P.E., P.S.
Lorain County Engineer
247 Hadaway Street
Elyria, OH 44035

Mr. James Cordes
Lorain County Administrator
226 Middle Avenue, 4th Floor
Elyria, OH 44035

Mr. Don Romancak, Director
Lorain County Community
Development Department
226 Middle Avenue, 5th Floor
Elyria, OH 44035

Mr. James Ziemnik, Director
Lorain County Metro Parks
12882 Diagonal Road
LaGrange, OH 44050

City of Lorain

The Honorable Jack M. Bradley
Mayor, City of Lorain
200 West Erie Avenue
Lorain, OH 44052

Mr. Joel Arredondo, President
City of Lorain Council
200 West Erie Avenue
Lorain, OH 44052

Ms. Nancy Greer, Clerk
City of Lorain Council
200 West Erie Avenue
Lorain, OH 44052

Mr. Dale Vandersommen, P.E.
City of Lorain Engineer
200 West Erie Avenue
Lorain, OH 44052

Ms. Karen Shawver
City of Lorain Auditor
200 West Erie Avenue
Lorain, OH 44052

Amherst Township

Mr. Dennis Abraham, Trustee
Amherst Township
7530 Oberlin Road
Elyria, OH 44035

Mr. David Urig, Trustee
Amherst Township
7530 Oberlin Road
Elyria, OH 44035

Mr. Neil Lynch, Trustee
Amherst Township
7530 Oberlin Road
Elyria, OH 44035

Ms. Chris Kish, Fiscal Officer
Amherst Township
7530 Oberlin Road
Elyria, OH 44035

Brownhelm Township

Mr. Orrin Leimbach, Trustee
Brownhelm Township Hall
1940 North Ridge Road
Vermillion, OH 44089

Mr. Gregory Abraham, Trustee
Brownhelm Township Hall
1940 North Ridge Road
Vermillion, OH 44089

Mr. James W. Northeim, Trustee
Brownhelm Township Hall
1940 North Ridge Road
Vermillion, OH 44089

Ms. Marsha Doane Funk,
Fiscal Officer
Brownhelm Township Hall
1940 North Ridge Road
Vermillion, OH 44089

Henrietta Township

Mr. Ron Baumann, Trustee
Henrietta Township
51428 SR 113
Amherst, OH 44001

Mr. Howard Born III, Trustee
Henrietta Township
9950 Gifford Rd.
Amherst, OH 44001

Mr. Joe R Knoble, Trustee
Henrietta Township
12313 Gifford Rd.
Oberlin, OH 44074

Mr. Joseph Siekeres
Henrietta Township
Fiscal Officer
9918 Gifford Rd.
Amherst, Ohio 44001

New Russia Township

Ms. Patti Brubaker, Trustee
New Russia Township
46268 Butternut Ridge Road
Oberlin, OH 44074

Mr. Jack A. Hoyt, Trustee
New Russia Township
46268 Butternut Ridge Road
Oberlin, OH 44074

Mr. Andrew Gulish, Trustee
New Russia Township
46268 Butternut Ridge Road
Oberlin, OH 44074

Ms. Lisa Marie Akers,
Fiscal Officer
New Russia Township
46268 Butternut Ridge Road
Oberlin, OH 44074

Camden Township

Mr. James Hozalski, Trustee
Camden Township
42 Court Street
Kipton, OH 44049

Mr. James D. Woodrum, Trustee
Camden Township
42 Court Street
Kipton, OH 44049

Mr. Gust Ristas, Trustee
Camden Township
42 Court Street
Kipton, OH 44049

Ms. Connie Karney, Fiscal Officer,
Camden Township
42 Court Street
Kipton, OH 44049

Brighton Township

Mr. Chris Stanfield, Trustee
Brighton Township Trustees
21956 State Rt. 511
Wellington, OH 44090

Mr. Kenneth N. Ziegler, Trustee
Brighton Township Trustees
21956 State Rt. 511
Wellington, OH 44090

Mr. Steve Urbansky, Trustee
Brighton Township Trustees
21956 State Rt. 511
Wellington, OH 44090

Ms. Marilyn L. Siekeres,
Fiscal Officer
Brighton Township
21956 State Rt. 511
Wellington, OH 44090

Rochester Township

Mr. Gerald J. Cowie, Trustee
Rochester Township Trustees
52185 Griggs Road
Wellington, OH 44090

Ms. Kathy Frombaugh, Trustee
Rochester Township Trustees
52185 Griggs Road
Wellington, OH 44090

Mr. Adam Mourton, Trustee
Rochester Township Trustees
52185 Griggs Road
Wellington, OH 44090

Ms. Laura A. Brady, Fiscal Officer
Rochester Township
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Wellington Township

Mr. Leroy Brasee, Trustee
Wellington Township
105 Maple Street
Wellington, OH 44090

Mr. Fred O. Pitts, Trustee
Wellington Township
105 Maple Street
Wellington, OH 44090

Ms. Nancy Fisher, Trustee
Wellington Township
105 Maple Street
Wellington, OH 44090

Ms. Virgina Haynes,
Fiscal Officer
Wellington Township
105 Maple Street
Wellington, OH 44090

Village of Wellington

The Honorable Hans M. Schneider,
Village Mayor
Wellington Village Hall
115 Willard Memorial Square
Wellington, OH 44090

Ms. Christa O'Brien,
Clerk of Council
Wellington Village Hall
115 Willard Memorial Square
Wellington, OH 44090

Mr. Gene Hartman, President
Wellington Village Council
Wellington Village Hall
115 Willard Memorial Square
Wellington, OH 44090

Ms. Vanya Hales, Finance Director
Wellington Village Hall
115 Willard Memorial Square
Wellington, OH 44090

Huntington Township

Mr. Jed Lamb, Trustee
Huntington Township Trustees
26309 State Route 58
Wellington, OH 44090

Mr. Robert D. Holmes, Trustee
Huntington Township Trustees
26309 State Route 58
Wellington, OH 44090

Mr. Walter C. Rollin, Trustee
Huntington Township Trustees
26309 State Route 58
Wellington, OH 44090

Ms. Sheila D. Lanning,
Fiscal Officer
Huntington Township
26309 State Route 58
Wellington, OH 44090

Libraries

Ms. Holly Lynn, Director
Ritter Public Library
5680 Liberty Avenue
Vermillion, OH 44089

Ms. Jill Warren,
Branch Manager
Keystone La Grange Library
101 West Street
Lagrange, OH 44050

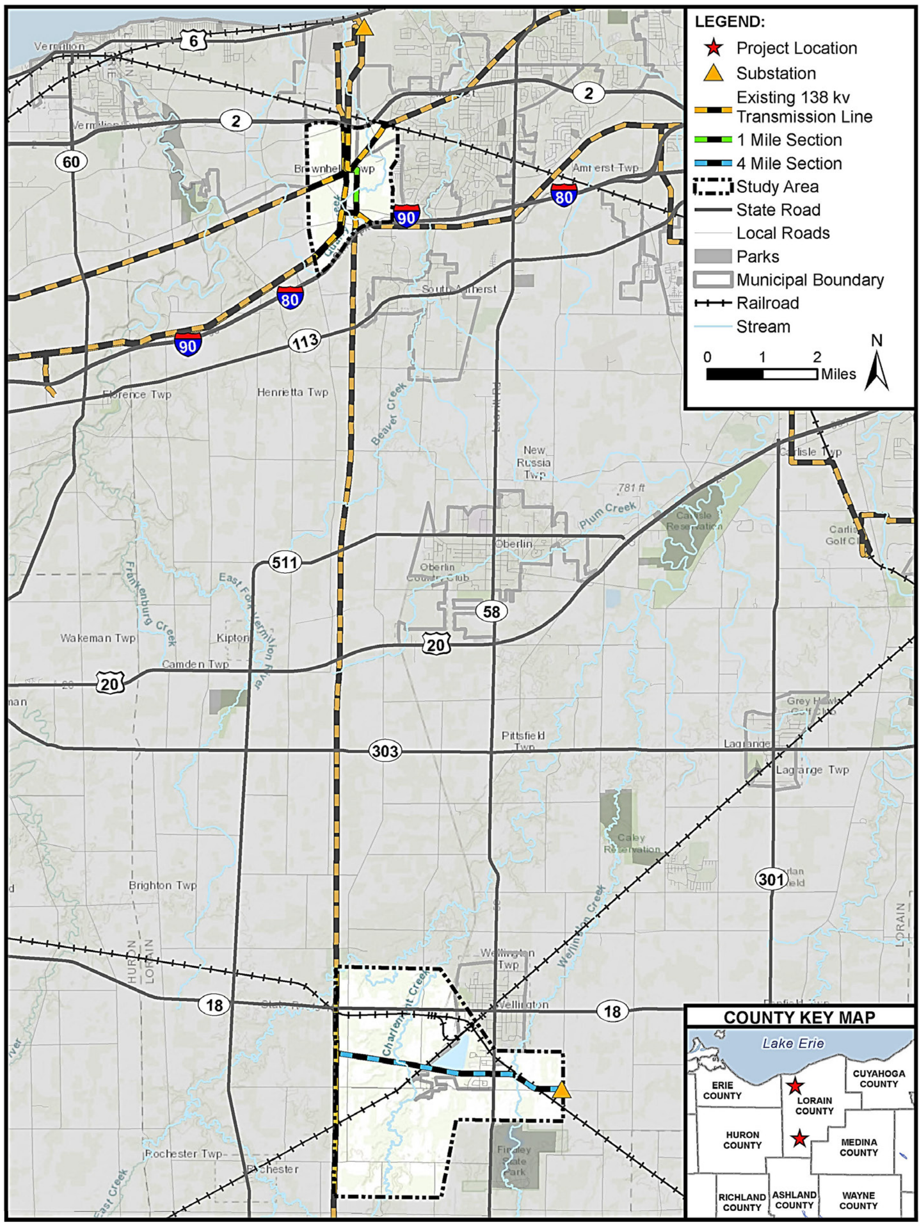
Mr. Donald Dovala,
Library Administrator
Amherst Public Library
221 Spring Street
Amherst, OH 44001

Appendix 6-2
Public Open Houses Informational Materials

Energizing the FUTURE

Beaver-Wellington 138-kV Transmission Line Project

At FirstEnergy, it's our responsibility to deliver the power our customers depend on in their daily lives. American Transmission Systems, Inc. (ATSI), a FirstEnergy company, has identified a need for a new 138-Kilovolt (kV) transmission line in Lorain County, Ohio, to enhance electric service reliability for existing customers, add redundancy to the network, and allow for future growth when new businesses or homes are built.



Project Overview

The project consists of the following primary components:

- Expanding an existing a 138-kV substation in Wellington Township to facilitate installation of new equipment.
- Constructing approximately 4-mile-long and 1-mile-long sections of the new 138-kV transmission line
- Reconfiguring the existing 138-kV transmission lines to create the new 138-kV transmission line.

ATSI will expand an existing 138-kilovolt (kV) substation in Wellington Township, Lorain County, to facilitate installation of new equipment. A second key component of the project will be to expand an approximately 4-mile long and 1-mile long sections of the new 138-kV transmission line. ATSI will also reconfigure the existing 138-kV transmission lines to create the new 138-kV transmission line.

FirstEnergy's ATSI affiliate will build and own the new facilities. The estimated project cost is approximately $22 million.

Continued

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

Routing

ATSI has identified proposed route alternatives after conducting a Route Selection Study (RSS) for both the approximately one-mile long section of new construction as well as the approximately 4-mile-long section of new construction. These routes have been carefully evaluated to minimize impacts to environmentally sensitive areas, property owners and communities.

Project Need

The Project is necessary to provide a second independent 138-kV source into the Wellington Substation and increase reliability and operational flexibility of the 138-kV and 69-kV systems in the area. The addition of the new 138-kV transmission line connection to the Wellington Substation creates a networked system. The 138-kV networked system configuration will allow for improved system reliability performance, restoration options, and flexibility with scheduled maintenance to reduce impact on transmission and distribution customers. The Project will also mitigate potential low voltage conditions that impact customers located on the Wellington and Brookside 69-kV systems in the event of an outage on the existing radial 138-kV transmission line. Finally, the Beaver-Wellington 138-kV Transmission Line will provide additional capacity for future load growth and economic development in the area.

Easements

ATSI will negotiate with property owners to obtain the easements and vegetation management rights to support the new transmission line. Wood H-Frame and/or steel structures will be located within the right-of-way along the final route.

Permitting

Detailed wetland, stream and other environmental and historical evaluations will be performed along the proposed transmission line routes, and necessary permits will be secured from state and federal agencies prior to construction.

Regulatory Approval

ATSI must obtain authorization from the Ohio Power Siting Board (OPSB) for the proposed line and substation expansion before construction can begin. The company expects to make the necessary submittals to the OPSB for the project by year end 2020. Construction will begin once approval is received.

Construction

Substation and transmission line construction will start in December 2020. All new facilities will be placed in service by July 2021.

Preliminary Project Timeline

Jan. 2020 .... Public Open House

Feb. 2020 .... OPSB Filing

Sept.–Dec. 2020 ..... OPSB Approval

Dec. 2020 .... Start of Substation Construction

Dec. 2020 .... Start of Transmission Line Construction

July 2021 .... Project Completed and In Service

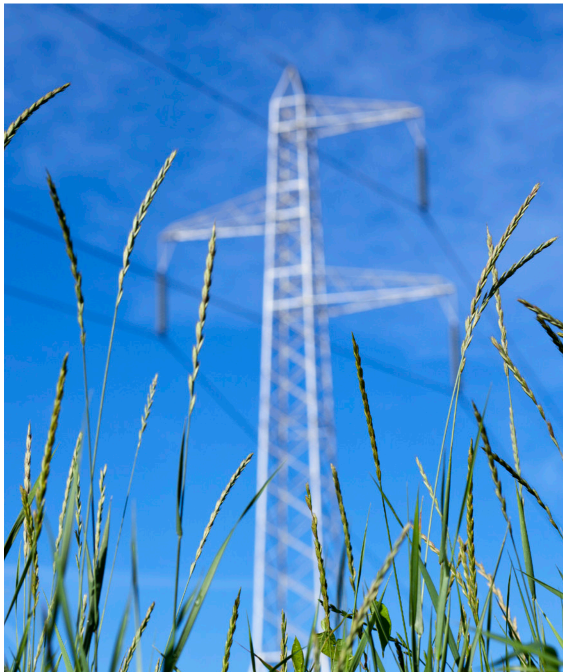
About *Energizing the Future*

Through *Energizing the Future*, FirstEnergy is upgrading and strengthening the transmission grid to meet the existing and future needs of our customers and communities. Projects are focused on upgrading or replacing aging equipment to harden our transmission infrastructure, reduce outages and cut maintenance costs; enhancing performance by building a smarter, more secure transmission system; and adding flexibility by building in redundancy and allowing system operators to more swiftly react to changing grid conditions.

For more information and project updates, visit firstenergycorp.com/about/transmission_projects/ohio

Energizing the FUTURE

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



What Are Electric and Magnetic Fields?

Electric and magnetic fields surround anything that generates, transmits, or uses electricity. **Electric fields** result from voltage that pushes electric current through an electrical wire. **Magnetic fields** are produced when electrical current flows through wires and electrical devices. Together, these electric and magnetic fields from electric power sources are commonly referred to as EMF.

Since electricity plays an important role in modern life and in almost everything we do, EMF can be found almost everywhere. The electricity system that is used to transmit and distribute electricity (e.g., transmission lines, distribution lines, and substations) is a source of EMF. When we use electricity in our homes, offices, schools, workplaces, hospitals, and public areas to power the many appliances, devices, and equipment we use for work, leisure, and transportation, EMF also are present.

Are There Guidelines That Limit Exposure to EMF?

There are no federal exposure limits in the United States and no state agency has adopted exposure limits based on a finding that EMF causes adverse health effects. Scientific organizations, however, have recommended exposure guidelines to protect the general public and workers from very high EMF levels, that have the potential to cause nerve and muscle stimulation, which are short-term and reversible effects. EMF levels found in our environment, including those near high-voltage power lines, however, are far too low to cause these effects.

Where Can I Find More Information?

Health Canada

http://healthycanadians.gc.ca/healthy-living-vie-saine/environment-environnement/home-maison/emf-cem-eng.php

National Cancer Institute

http://www.cancer.gov/cancertopics/factsheet/Risk/magnetic-fields

World Health Organization

http://www.who.int/peh-emf/en/

National Institute of Environmental Health Sciences

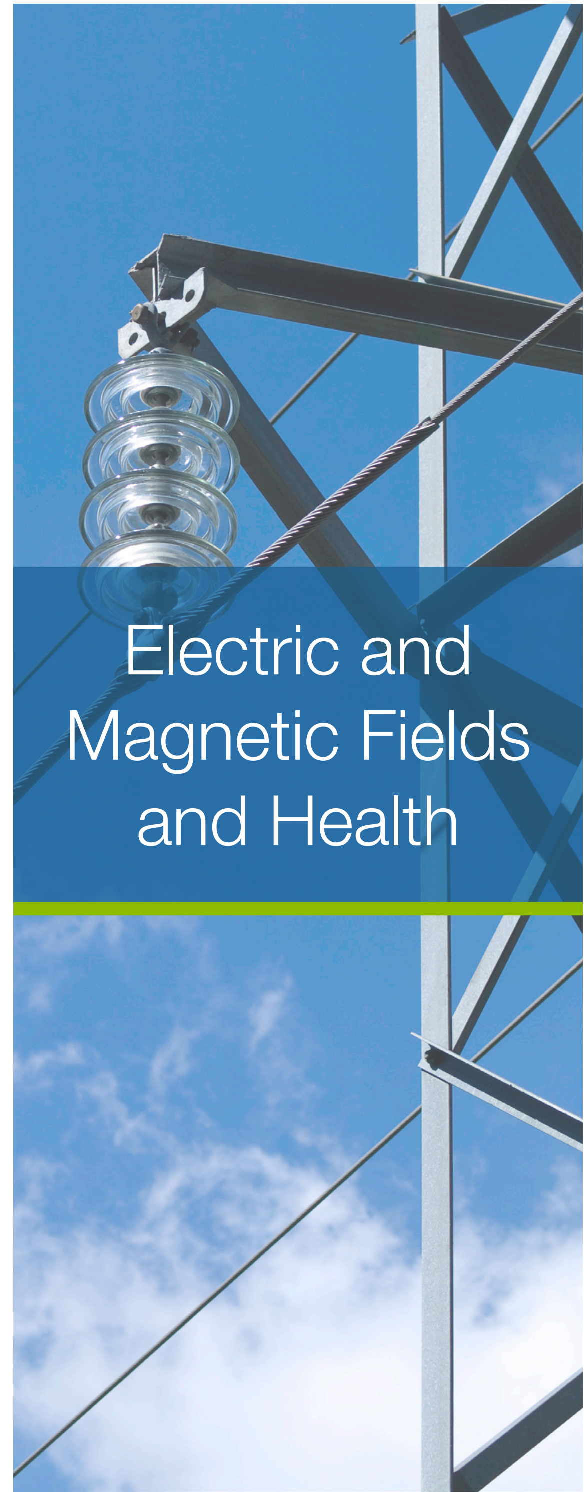
http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

European Commission – SCENIHR

http://ec.europa.eu/health/scientific_committees/consultations/public_consultations/scenihr_consultation_19_en.htm

Exponent®

Prepared by Exponent for FirstEnergy | January 2016



Electric and Magnetic Fields and Health

How Is EMF Measured and What Are Typical Levels in the Home?

Electric fields are measured in units of volts per meter (V/m) and magnetic fields are measured in milligauss (mG), microtesla (μT) or millitesla (mT) (1 mG = 0.1 μT = 0.0001 mT). The highest levels of EMF are measured directly near the source, and decrease rapidly with distance. Since electric fields are easily blocked or weakened by walls or other objects, more research has been conducted on magnetic fields.

In our homes, magnetic fields are generated from appliances, the wiring that powers those appliances, the distribution lines that deliver electricity to the home, and any currents flowing on water pipes. Magnetic fields from nearby transmission lines also have the potential to contribute to the magnetic-field levels inside a home, but since magnetic fields decrease rapidly as you get farther away from the source, the contribution of transmission lines to a home's magnetic-field level may be less than from other closer sources. The typical average level of magnetic fields in homes in the United States measured away from appliances is approximately 1 mG, while in close proximity to common appliances that are in use, the magnetic-field level can range from tens to hundreds of mG (Table 1).

Table 1. Magnetic Fields Measured from Appliances

Source	Distance from Source*		
	6 inches (mG)	1 foot (mG)	2 feet (mG)
Can Opener	600	150	20
Vacuum Cleaner	300	60	10
Hair Dryer	300	1	–
Portable Heater	100	20	4
Electric Range	30	8	2
Dishwasher	20	10	4
Toaster	10	3	–
Coffee Maker	7	–	–

Source: EMF Questions and Answers (NIEHS, 2002)

* The numbers represent the median magnetic field (i.e., half of the appliances tested had higher levels and half had lower levels than those shown in the figure).

Equipment within substations also produces magnetic fields, but here too, the fields drop off quickly with distance. At the boundary of substation sites, the magnetic field from substation equipment is typically within the range of levels found inside our homes. The dominant source of magnetic fields near substation boundaries is the power lines serving the substation.

How Are Potential Health Effects Studied?

There are three main approaches that scientists use to study potential effects of exposure to any physical, chemical, or biological agent, including EMF. Over the past 35 years, thousands of studies have been published in research areas related to EMF.

Epidemiologic studies are conducted among people to observe if persons with a disease (such as cancer) experienced higher exposures to EMF than persons without that disease.

Laboratory animal studies (also called *in vivo* studies) are conducted in laboratory animals, most commonly mice and rats, to test whether extended exposures to high levels of EMF cause increased rates of disease or toxic effects.

Laboratory studies of cells and tissues (also called *in vitro* studies) are conducted to see if exposure to EMF can cause any changes in biological processes that could lead to disease.

How Are Scientific Conclusions Drawn from Health Studies?

First and foremost, no single study or a selected small group of studies can form the sole basis of a valid scientific assessment. The method that scientists use to conduct health risk assessments involves the evaluation of all relevant studies in the three main research areas discussed above. The three areas have varying strengths and limitations, thus, they contribute different information to a scientific evaluation and have to be weighed together. Because epidemiologic studies are conducted among people, the main interest of health research, they provide highly relevant scientific evidence. *In vivo* studies can be well controlled by the investigators and can expose animals to high levels of exposure for long time periods up to the entire lifetime of the animals. While animal studies require extrapolation between species, these tests form the primary basis for assessing the safety of all drugs and medicines. *In vitro* laboratory studies may contribute to better scientific understanding of biological processes and potential exposure effects on a cellular level; however, because cells and tissues may not react the same way in experimental settings as in intact organisms, no direct conclusions can be drawn from *in vitro* studies about disease and adverse health effects. In the overall evaluation, scientists look for overall patterns within and across the three research areas. Epidemiology and *in vivo* studies have primary importance, while *in vitro* studies contribute secondary information in the assessment of scientific evidence. Studies also vary greatly in their quality, thus, each study contributes different weight in the overall evaluation. Higher quality studies contribute more weight, while lower quality studies contribute less weight, and studies with very poor methods may not contribute at all.

What Have Authoritative Scientific Organizations Concluded?

Numerous scientific organizations have assembled groups of independent scientists with expertise in a variety of disciplines to perform comprehensive reviews of EMF research. These organizations include the International Agency for Research on Cancer, the International Commission on Non-Ionizing Radiation, the National Institute of Environmental Health Sciences, the World Health Organization, and most recently in 2015, a Scientific Committee of the European Commission. Overall, the conclusions of these panels are consistent and can be summarized generally, as follows:

- The research does not support the conclusion that EMF causes any long-term, adverse health effects.
- Some epidemiologic studies have reported a statistical association between high, average magnetic-field levels and childhood leukemia. No authoritative agency has concluded, however, that magnetic fields cause childhood leukemia due to the limitations of these studies and the lack of evidence from laboratory studies.
- The *in vivo* studies, overall, do not report an increase in cancer among animals exposed to high levels of EMF even after lifetime exposures.
- The *in vitro* studies provide no explanation as to how magnetic fields could cause disease.

Beaver Wellington 138 Kilovolt Transmission Project

January 7, 2020

Name: ____

Address: ____

City: ____________________________ State: _______________ Zip code: _____________

Phone: _______________________ Email: ____________________________

Comments:

Name of Representative Taking Inquiry (if applicable):

Please direct questions to and share your comments on the project with Ohio Edison (A FirstEnergy company) representatives. In addition, please add your questions or comments about the project on this form and give it to one of the representatives before leaving this meeting. If you choose to provide comments after the meeting, please send those comments to Robert Maggiore, 76 S. Main St., Akron, Ohio 44308. Providing your written questions and comments provides the best opportunity for us to identify your questions and to consider your comments. Thank you.

Beaver - Wellington 138 Kilovolt Transmission Project

January 8, 2020

Name:____

Address: ____

City: __________________________ State:______________ Zip code: ____________

Phone: _____________________ Email: __________________________

Comments:

Name of Representative Taking Inquiry (if applicable):

Please direct questions to and share your comments on the project with Ohio Edison (A FirstEnergy company) representatives. In addition, please add your questions or comments about the project on this form and give it to one of the representatives before leaving this meeting. If you choose to provide comments after the meeting, please send those comments to Robert Maggiore, 76 S. Main St., Akron, Ohio 44308. Providing your written questions and comments provides the best opportunity for us to identify your questions and to consider your comments. Thank you.

Virtual Open House Materials

FirstEnergy

Beaver-Wellington138-kV Transmission Line Project

American Transmission Systems, Incorporated ("ATSI")
a FirstEnergy company

Meeting

July 2020

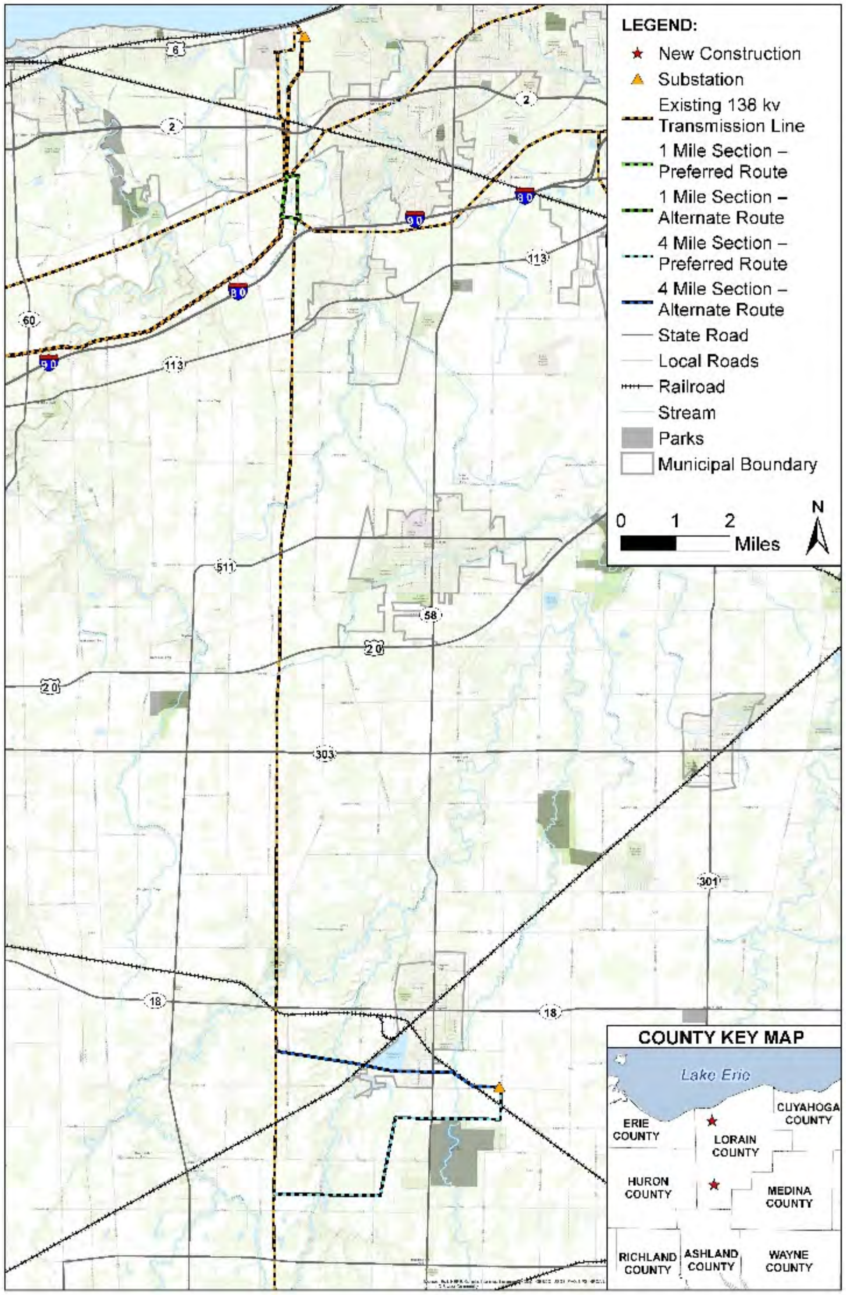
Energizing the FUTURE

FirstEnergy TRANSMISSION

Beaver-Wellington Project

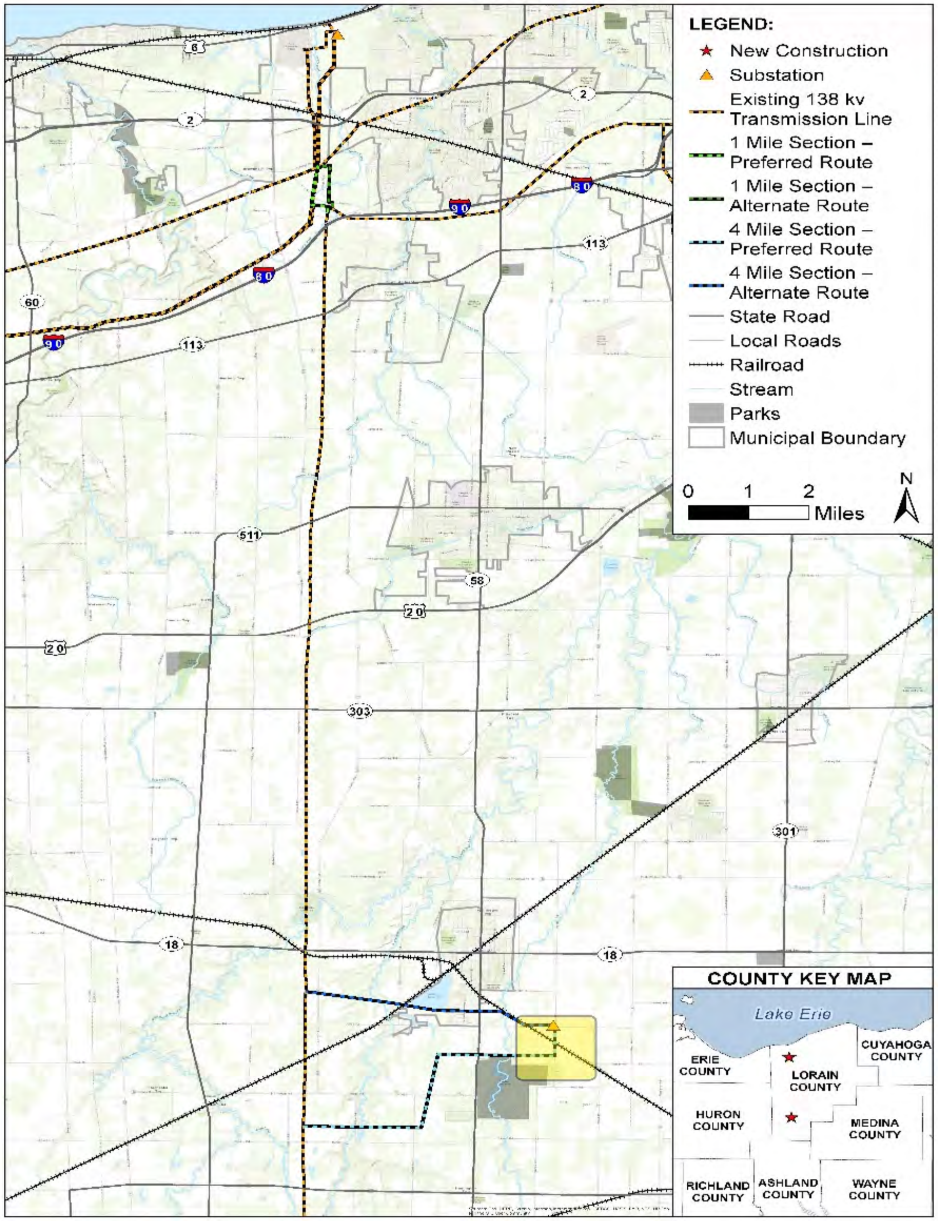
Overview

- **An approximately 23.2-mile, 138-kV transmission line connecting the Beaver and Wellington substations in Lorain County, OH**



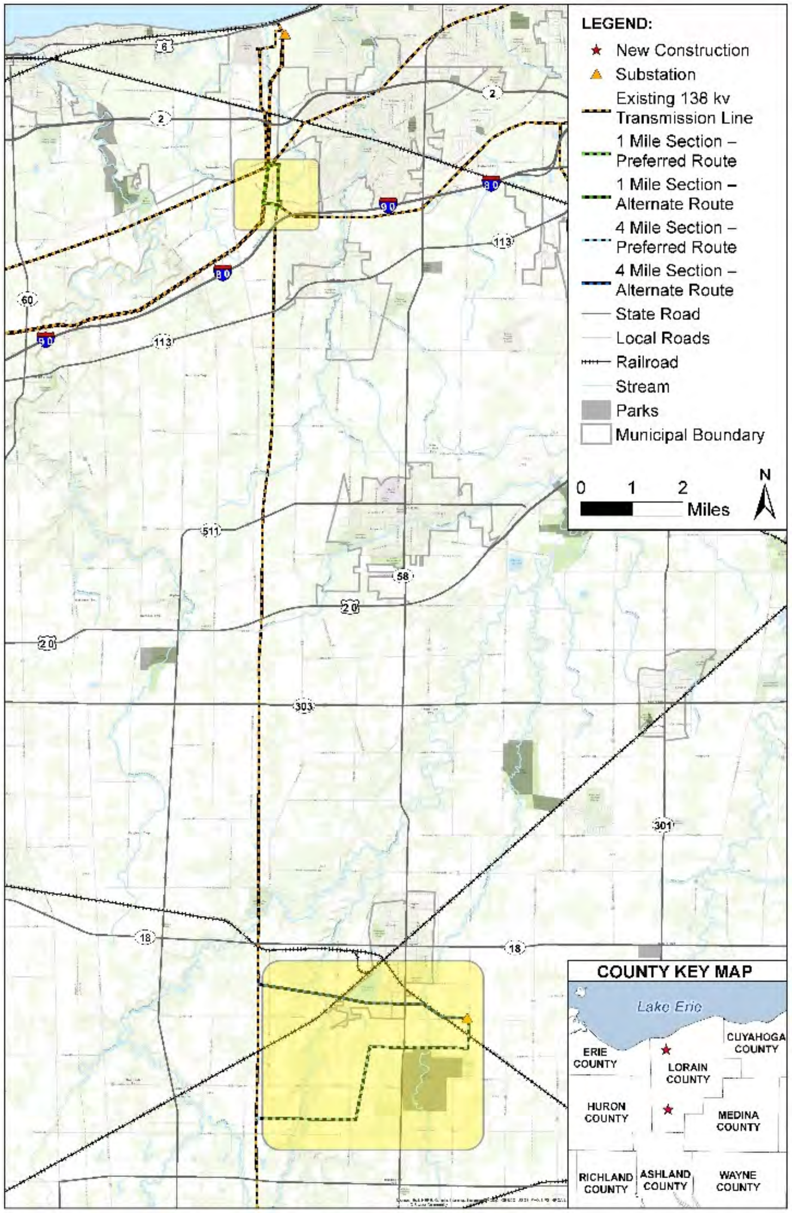
Beaver-Wellington Project Overview:

Expansion of Existing Wellington Substation



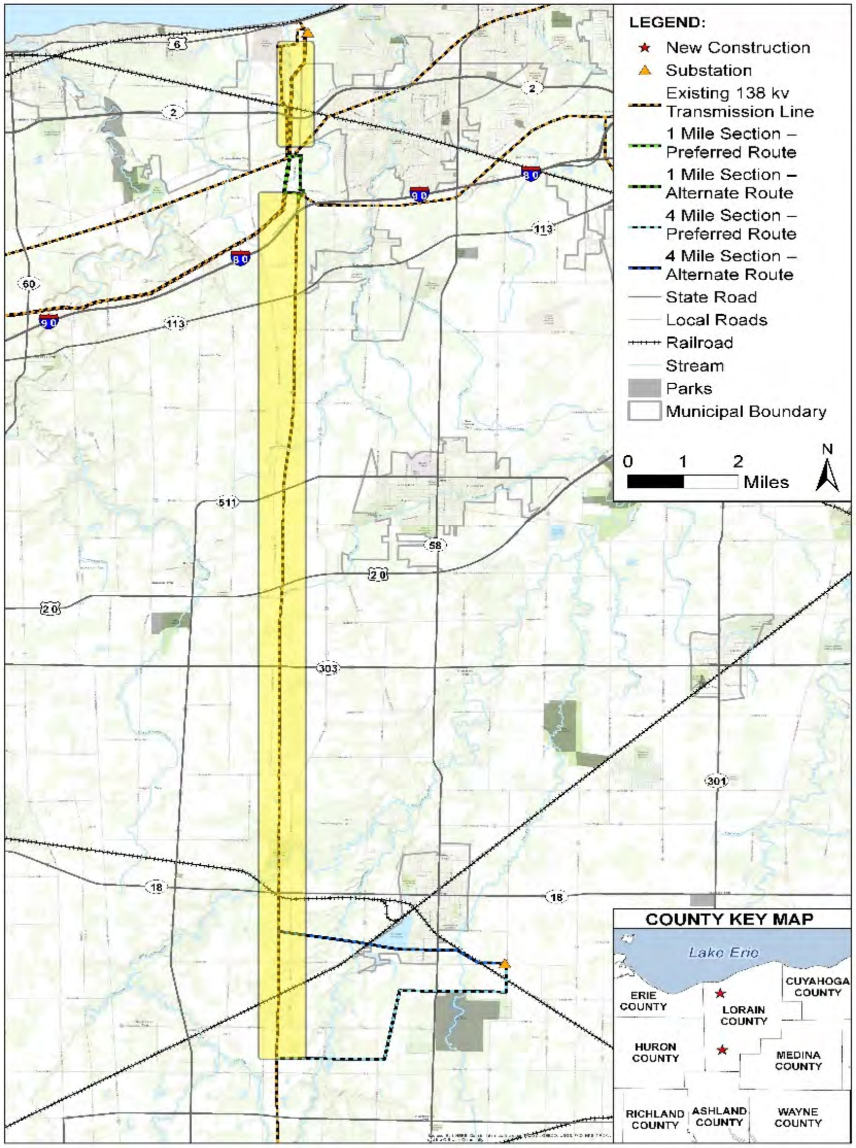
Beaver-Wellington Project Overview:

Construction of New 138-kV Transmission Line Sections



Beaver-Wellington Project Overview:

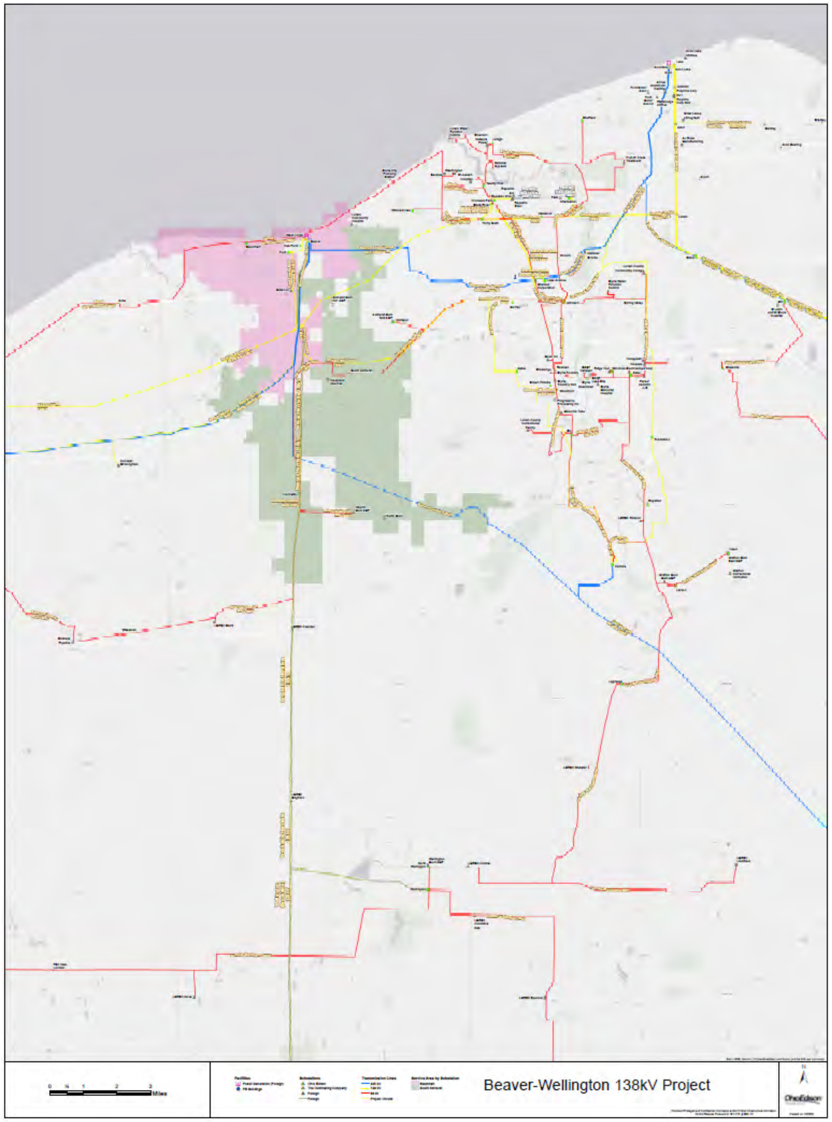
Reconfiguration of Existing 138-kV Transmission Line



Beaver-Wellington Project:

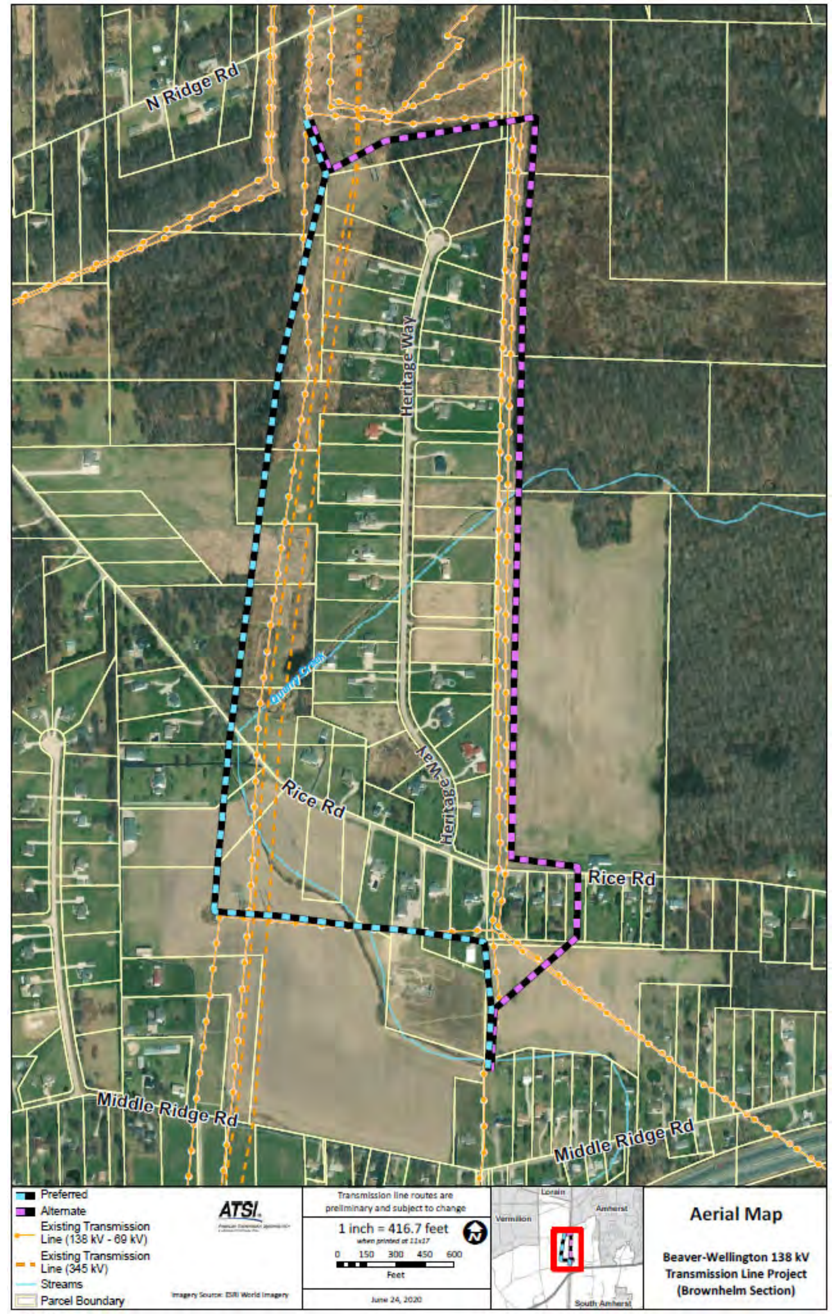
Needs & Benefits

- **Improve system reliability performance**
- **Provide quicker and safer restoration options**
- **Increase flexibility to conduct scheduled maintenance on transmission system**
- **Provide additional capacity for future load growth and economic development**



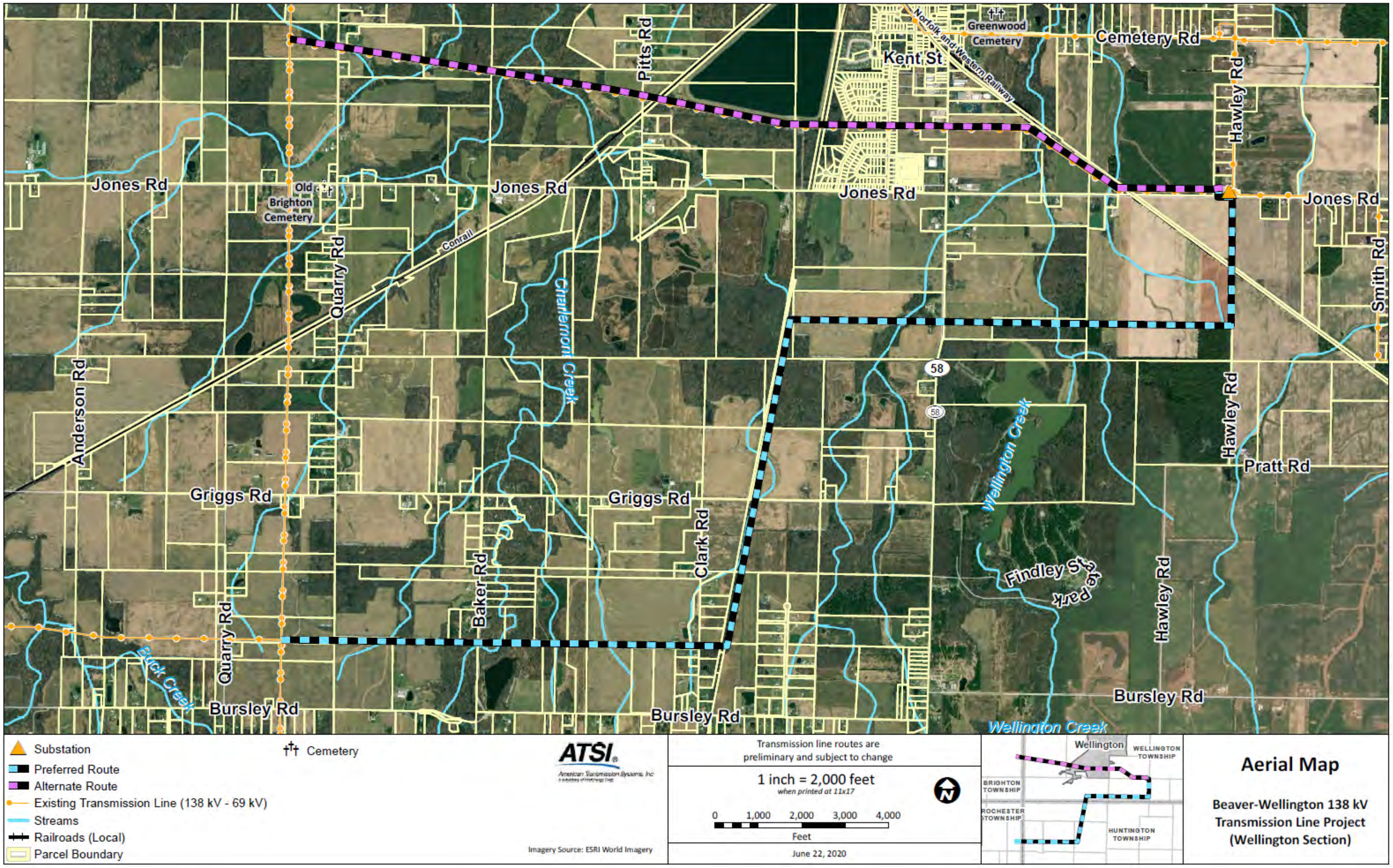
Beaver-Wellington Project Route Alternatives:

Brownhelm Section



Beaver-Wellington Project Route Alternatives:

Wellington Section



Beaver-Wellington Project:

Engineering Design Structure Types

50'-110' Single and
Multi Pole Wood Structures:

60'-120' Steel Monopoles:

Beaver-Wellington Project:

Real Estate Negotiations

- **Required transmission line right-of-way width of 65' to 100'**
- **ATSI will negotiate with property owners to obtain necessary land rights, such as:**
  - Easement agreements
  - Priority Tree Rights
  - Access Roads
- **Rights may be acquired through eminent domain as a last resort**

Beaver-Wellington Project:

Vegetation Management

- **Proper vegetation management is an important part of ensuring electric system reliability**
- **FirstEnergy focuses on responsible vegetation management to create a sustainable, compatible low-growing habitat that supports reliable electric service**

Beaver-Wellington Project:

Environmental Permitting

Principle Regulatory Agencies

- **U.S. Army Corps of Engineers**
- **U.S. Fish & Wildlife Service**
- **Federal Land Managers (NPS,NFS)**
- **Ohio Environmental Protection Agency**
- **Ohio Department of Natural Resources**
- **State Cultural Agencies**
- **County and Municipal Agencies**

Beaver-Wellington Project:

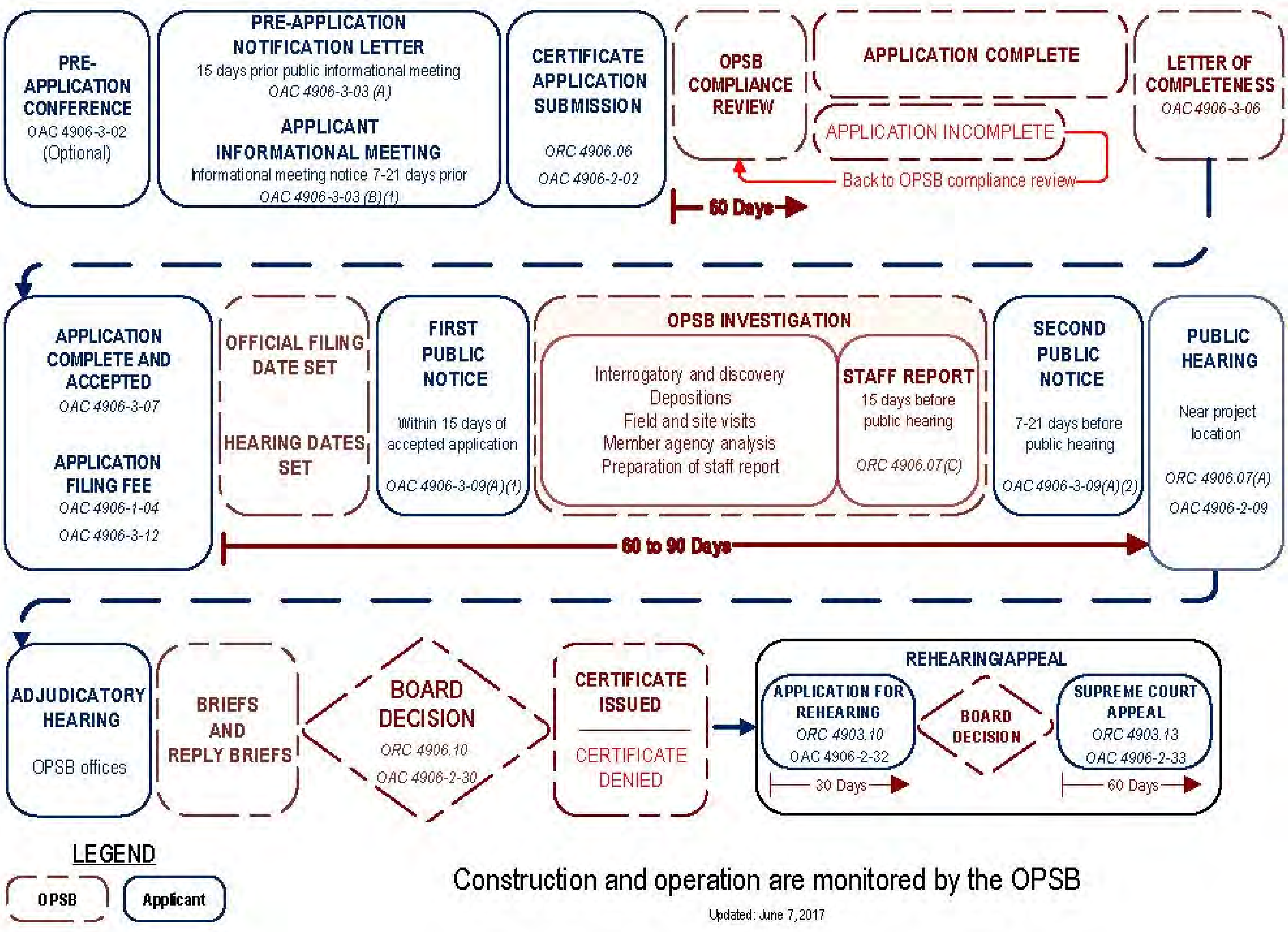
Ohio Power Siting Board (OPSB) Approval Process

- **ATSI must submit an application to the OPSB to secure approval for the Project**
- **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**

Ohio | Power Siting Board

Beaver-Wellington Project:

OPSB Standard Application Process Flowchart



Beaver-Wellington Project:

Proposed Construction Schedule

January 7 and 8, 2020
Public Information Meeting

July 15-August 14, 2020
Alternative Public Engagement and Comment Period

August 2020
OPSB Filing

May–June 2021
Anticipated OPSB Approval

June 2021
Tentative Start of Construction

2020	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

December 2021
Project Completion

Beaver-Wellington Project:

Ohio Power Siting Board (OPSB) Contact Information

- **More information on the OPSB, its composition, and the process it will follow in reviewing the project application is available via the following:**
  - Website: www.opsb.ohio.gov
  - E-mail: contactopsb@puco.ohio.gov
  - Phone: 866-270-6772
  - Mail: 180 East Broad Street 11th Floor, Columbus, Ohio 43215
- **When contacting with OPSB about the project, use the following references:**
  - Project Name: Beaver-Wellington 138-kV Transmission Line
  - OPSB Case Number: 20-0004-EL-BTX

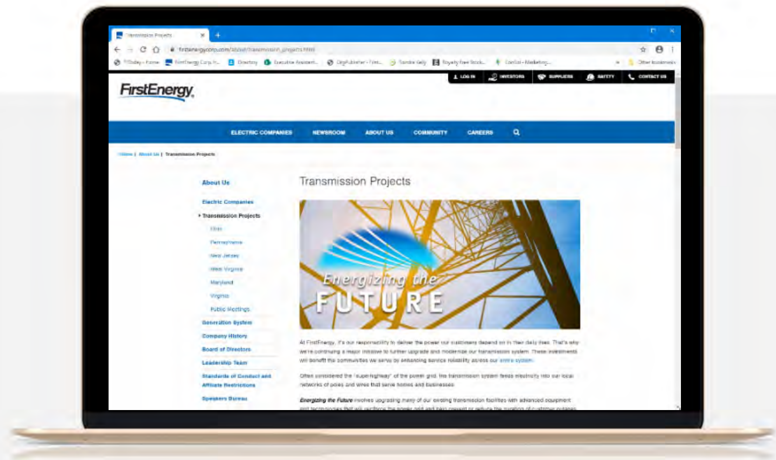
Beaver-Wellington Project:
FirstEnergy/ATSI Contact Information

- **Visit the project website for additional information**
- **Contact us if you'd like to schedule an individual meeting for further discussion**

Email: transmissionprojects@firstenergycorp.com

Phone: 1-888-311-4737

Website: www.firstenergycorp.com/about/transmission_projects/ohio/beaver-wellington



Thank You

Energizing the FUTURE

FirstEnergy

TRANSMISSION

QA

Beaver-Wellington 138 kV Transmission Line Project

Today's Date: ________________

Name:____

Address: ____

City: ____________________________________ State: _________ ZIP Code: ________________________

Phone: ___________________________________ Email: ____

Comments:

Name of FirstEnergy Representative Taking Inquiry (if applicable)____________________________________

Energizing the FUTURE

Beaver-Wellington 138-kV Transmission Line Project

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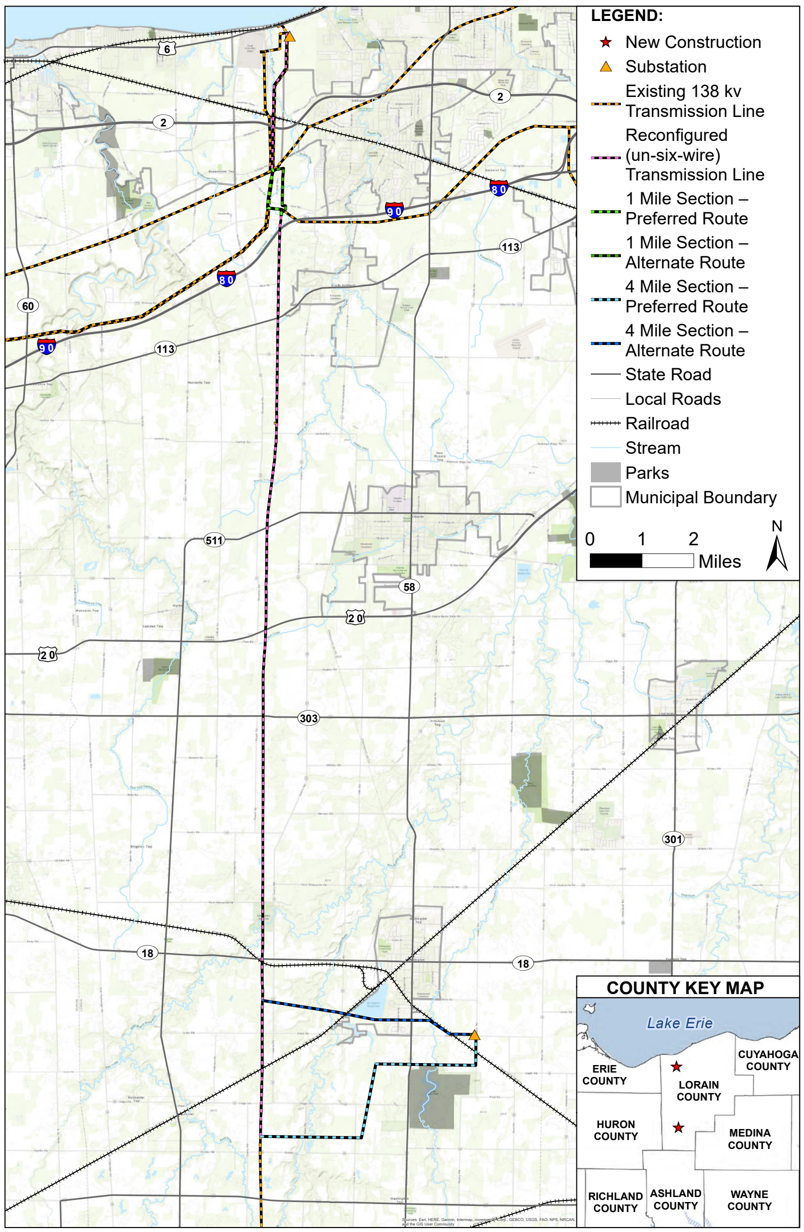

Project Overview

The Project consists of the following primary components:

- Expanding an existing a 138-kV substation in Wellington Township to facilitate installation of new equipment.
- Constructing approximately 4-mile-long and 1-mile-long sections of the new 138-kV transmission line
- Reconfiguring the existing 138-kV transmission lines to create the new 138-kV transmission line.

ATSI will build and own the new facilities. The estimated project cost is approximately $19 million.

Routing

ATSI has identified proposed route alternatives after conducting a Route Selection Study (RSS) for both the approximately one-mile long section of new construction as well as the approximately 4-mile-long section of new construction. These routes have been carefully evaluated to minimize impacts to environmentally sensitive areas, property owners and communities.

Continued

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Produced by FirstEnergy's Communications and Branding Department

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

Project Need

The Project is necessary to provide a second independent 138-kV source into the Wellington Substation and increase reliability and operational flexibility of the 138-kV and 69-kV systems in the area. The addition of the new 138-kV transmission line connection to the Wellington Substation creates a networked system. The 138-kV networked system configuration will allow for improved system reliability performance, restoration options, and flexibility with scheduled maintenance to reduce impact on transmission and distribution customers. The Project will also mitigate potential low voltage conditions that impact customers located on the Wellington and Brookside 69-kV systems in the event of an outage on the existing radial 138-kV transmission line. Finally, construction of the Project will directly improve electric service for approximately 27,900 customers served by the transmission system in the Project area and provide additional capacity for economic development and load growth in the area.

Easements

ATSI will negotiate with property owners to obtain the easements and vegetation management rights to support the new transmission line. Wood H-Frame and/or steel structures will be located within the right-of-way along the final route.

Permitting

Detailed wetland, stream and other environmental and historical evaluations will be performed along the proposed transmission line routes, and necessary permits will be secured from state and federal agencies prior to construction.

Regulatory Approval

ATSI must obtain authorization from the Ohio Power Siting Board (OPSB) for the proposed line and substation expansion before construction can begin. The company expects to make the necessary submittals to the OPSB for the project in August 2020. Construction will begin once approval is received.

Construction

Substation and transmission line construction are scheduled to start in June 2021. All new facilities are scheduled to be placed in service by December 2021.

Preliminary Project Timeline

January 7 and 8, 2020	Public Information Meeting
July 15–August 14, 2020	Public Engagement and Comment Period
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December 2021	Project Completed and In Service

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Through *Energizing the Future*, FirstEnergy is upgrading and strengthening the transmission grid to meet the existing and future needs of our customers and communities. Projects are focused on upgrading or replacing aging equipment to harden our transmission infrastructure, reduce outages and cut maintenance costs; enhancing performance by building a smarter, more secure transmission system; and adding flexibility by building in redundancy and allowing system operators to more swiftly react to changing grid conditions.

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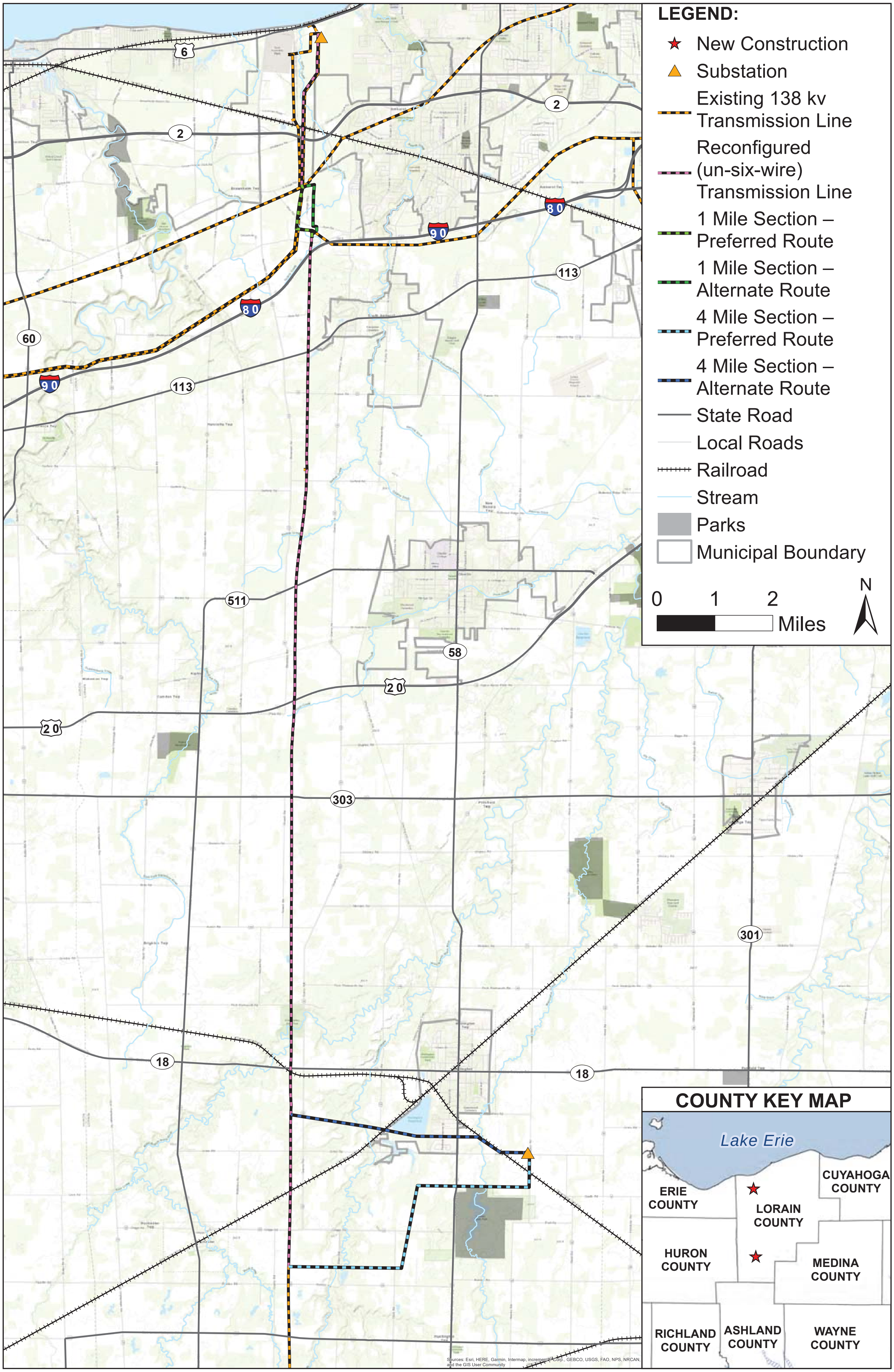

LEGEND:
New Construction
Substation
Existing 138 kv Transmission Line
Reconfigured (un-six-wire) Transmission Line
1 Mile Section – Preferred Route
1 Mile Section – Alternate Route
4 Mile Section – Preferred Route
4 Mile Section – Alternate Route
State Road
Local Roads
Railroad
Stream
Parks
Municipal Boundary
0
1
2
Miles
N
COUNTY KEY MAP
Lake Erie
ERIE COUNTY
LORAIN COUNTY
CUYAHOGA COUNTY
HURON COUNTY
MEDINA COUNTY
RICHLAND COUNTY
ASHLAND COUNTY
WAYNE COUNTY
6
2
2
90
80
80
90
113
113
60
511
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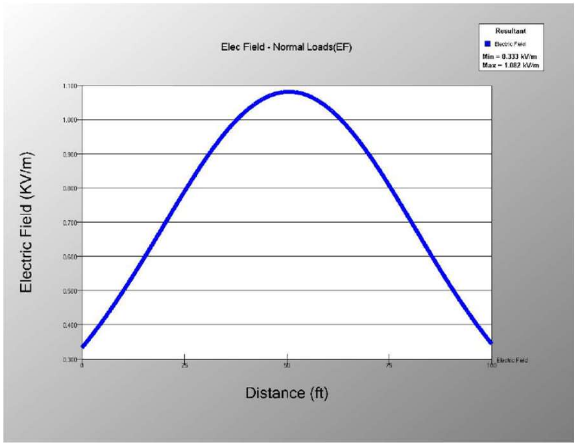
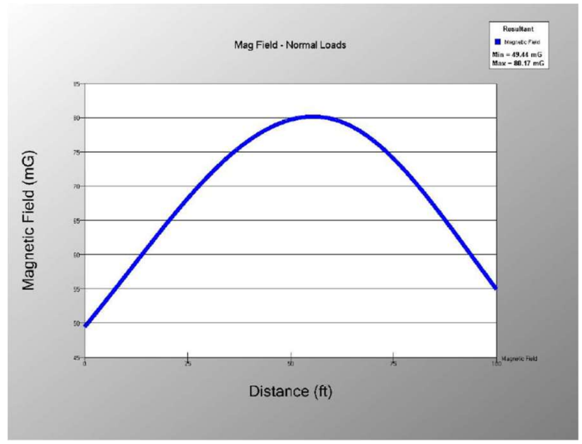
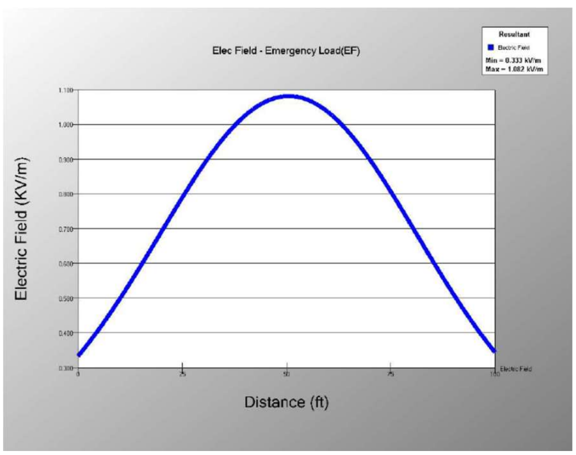
20
20
303
301
18
18

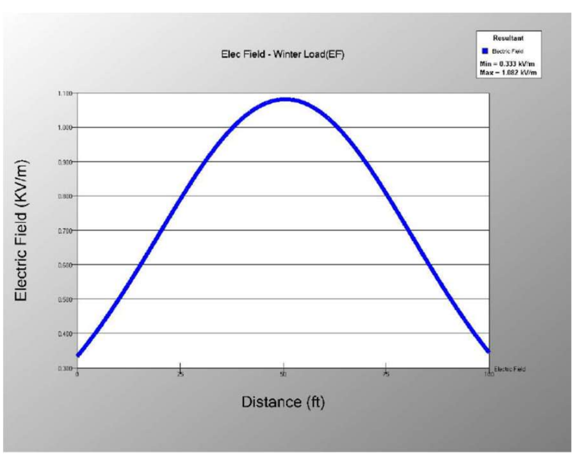
Appendix 7-1
Typical Cross Section Profiles of the Normal Calculated Electric Fields and Magnetic Fields for all Scenarios Considered (Exhibits 7-1 through 7-32)

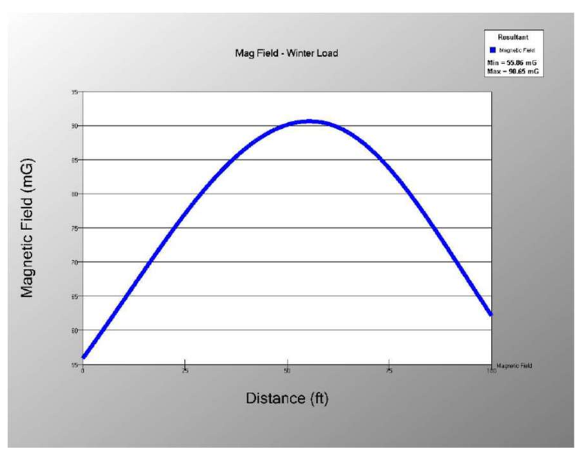
Exhibit 7-1
For Table 7-2











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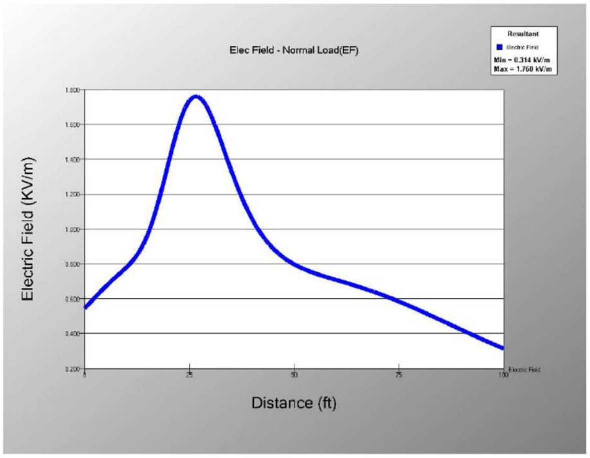

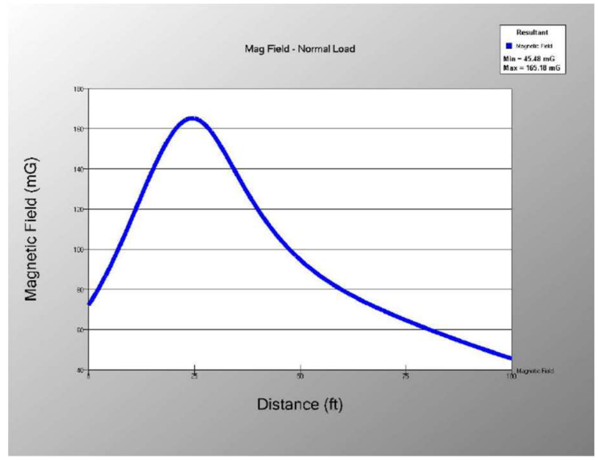

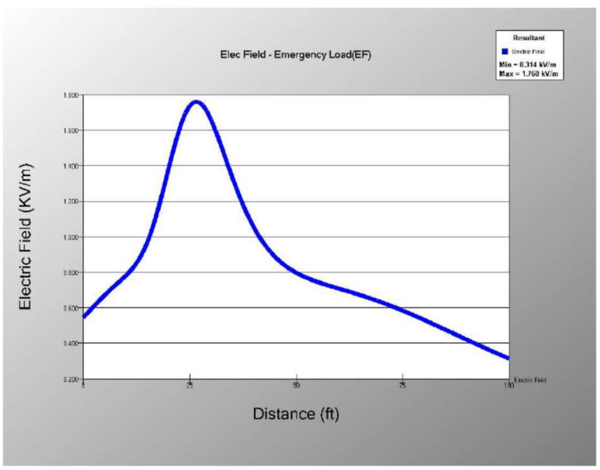

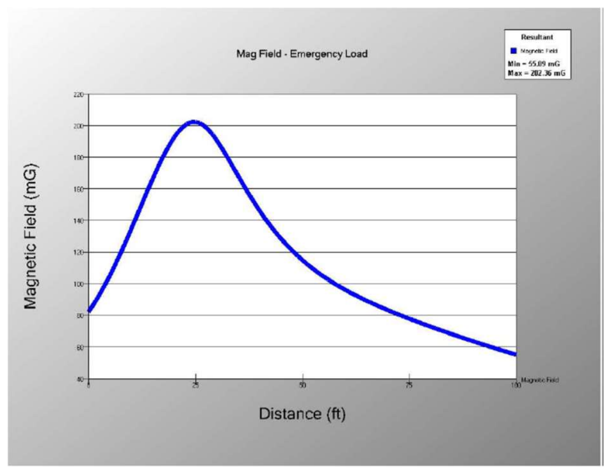

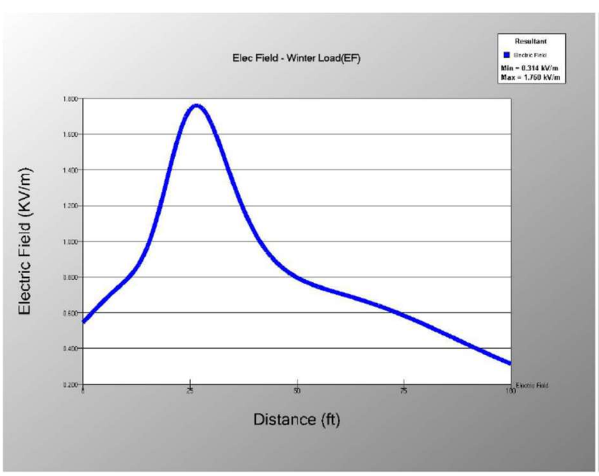

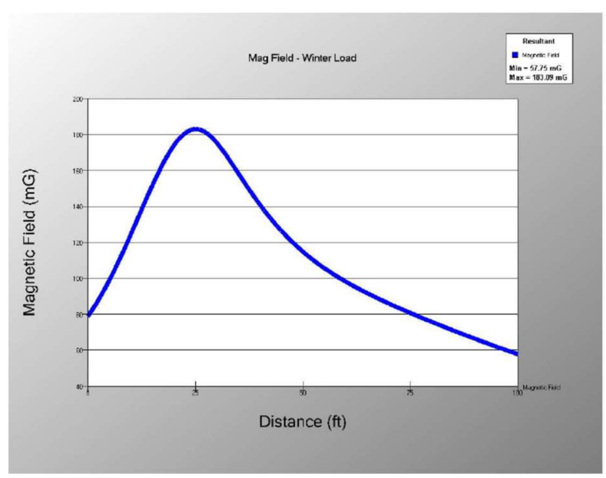

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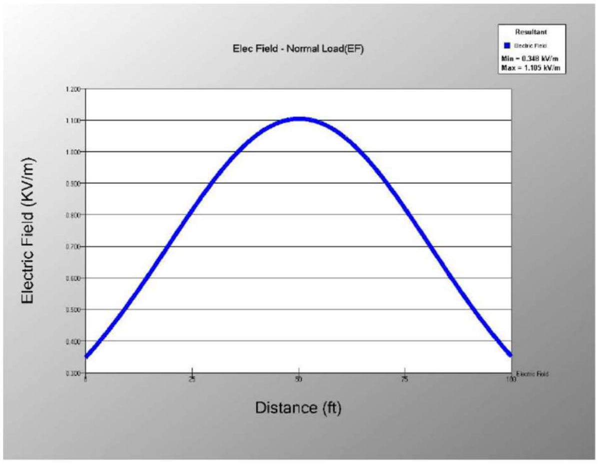

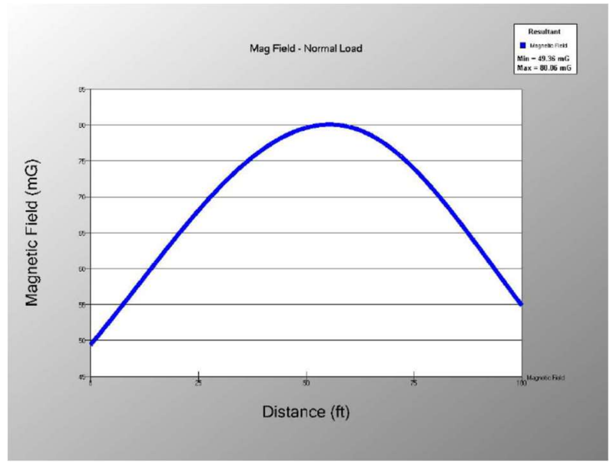

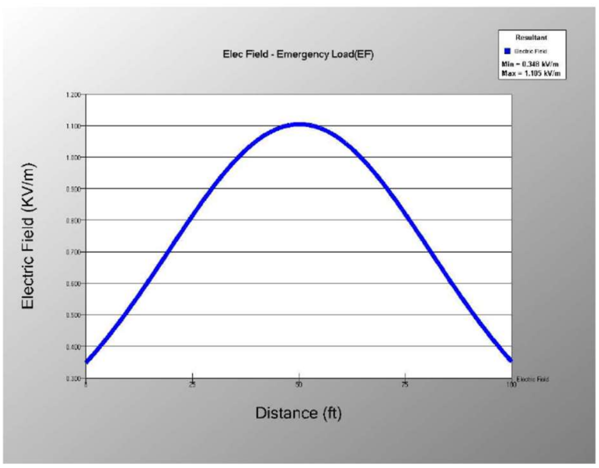

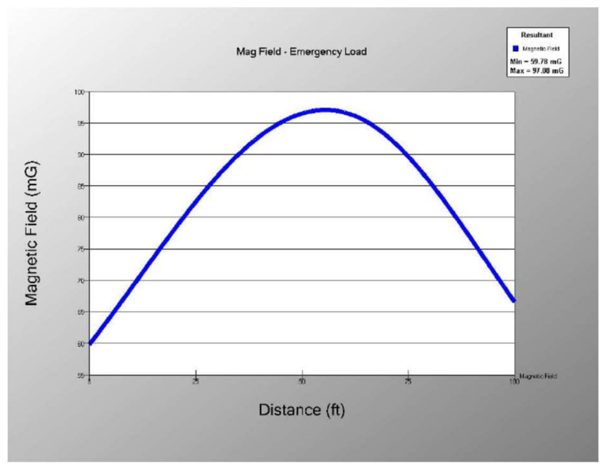

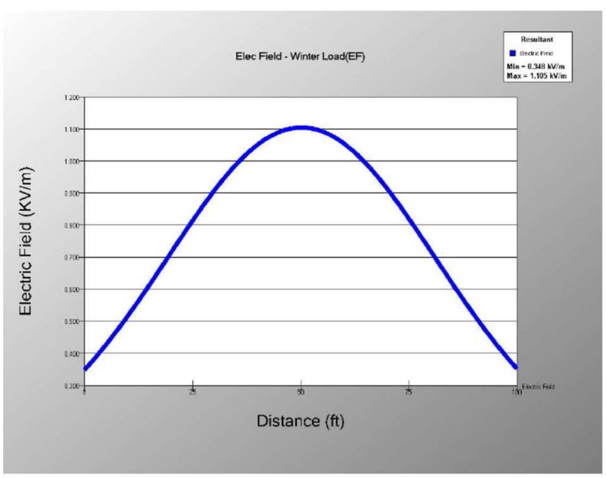

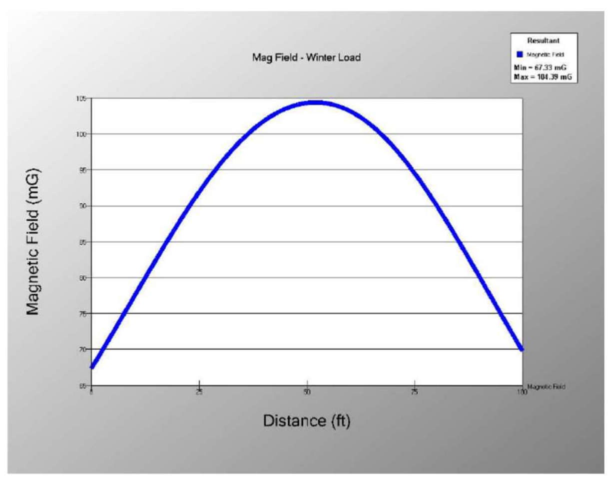

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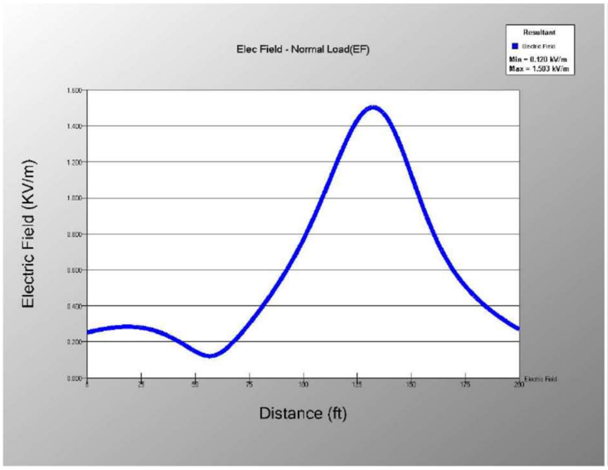
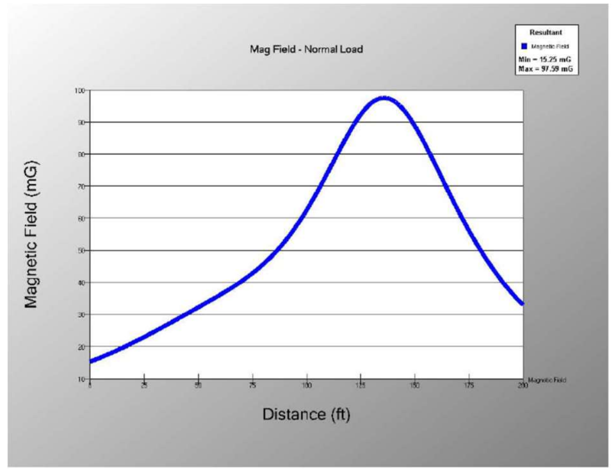
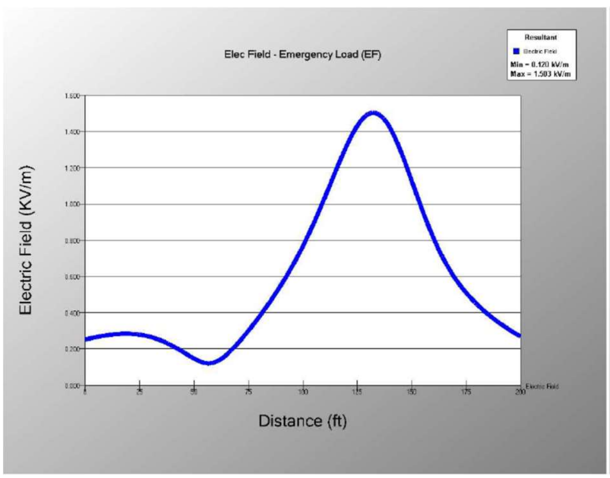
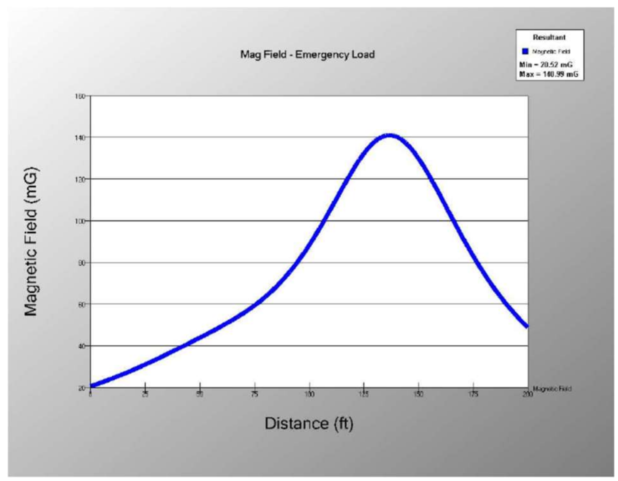
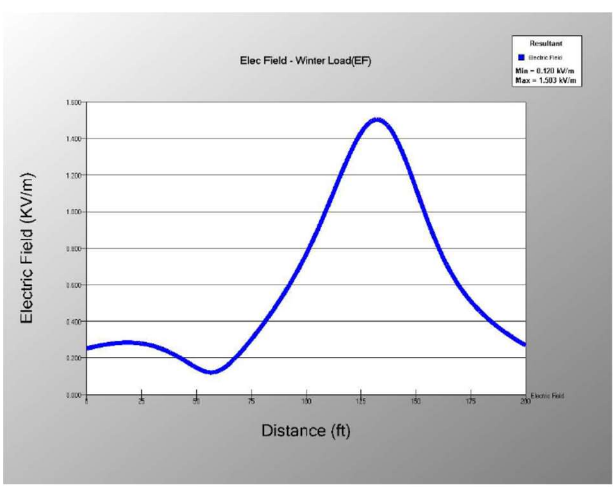
For Table 7-5

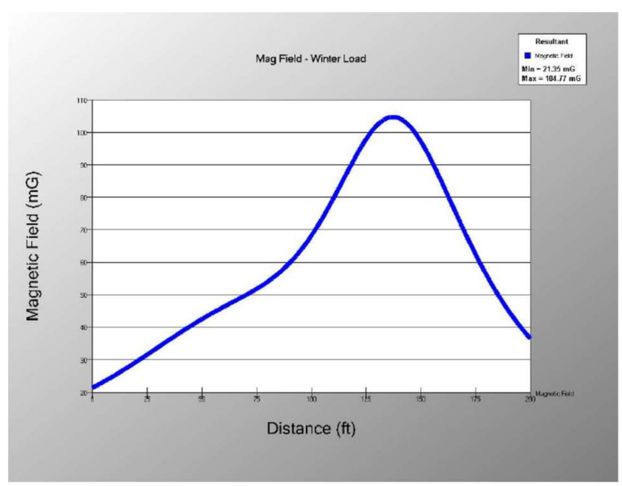












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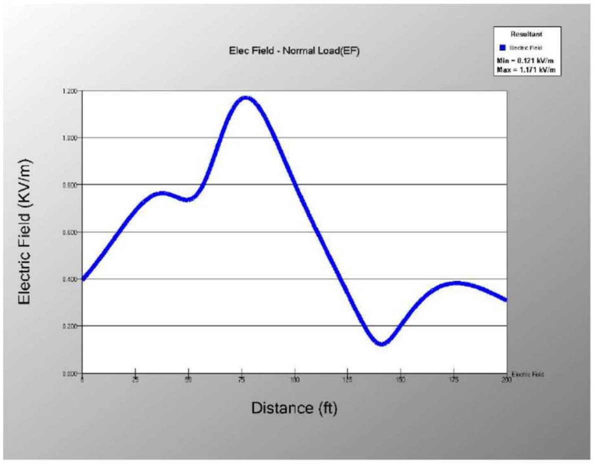

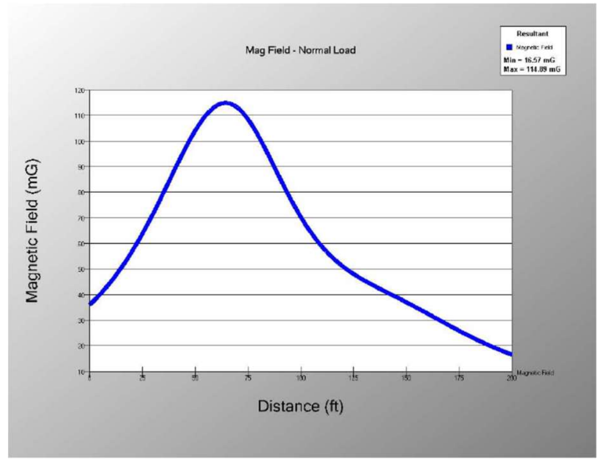

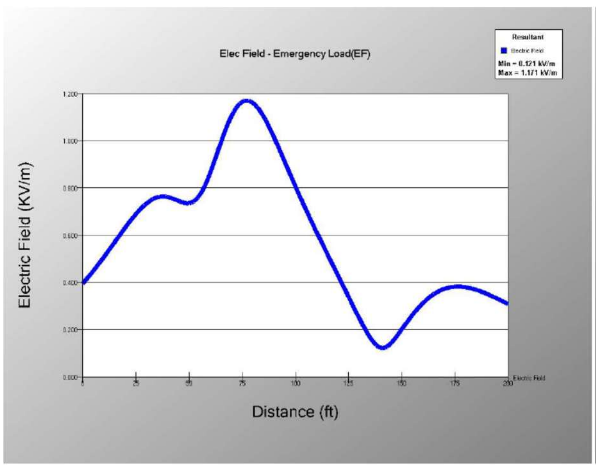

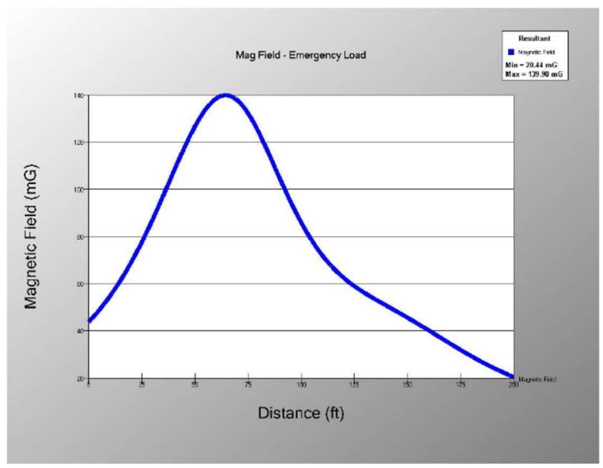

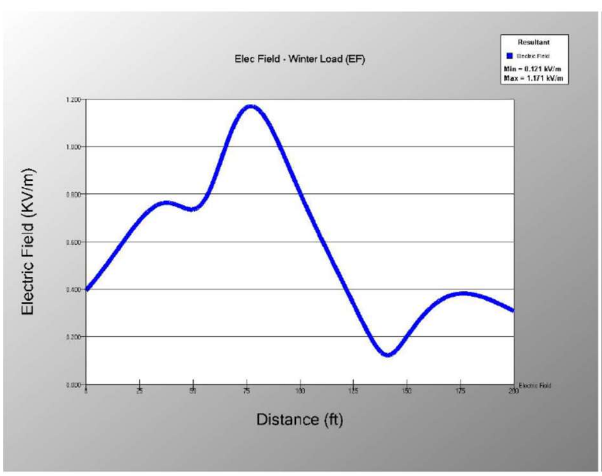

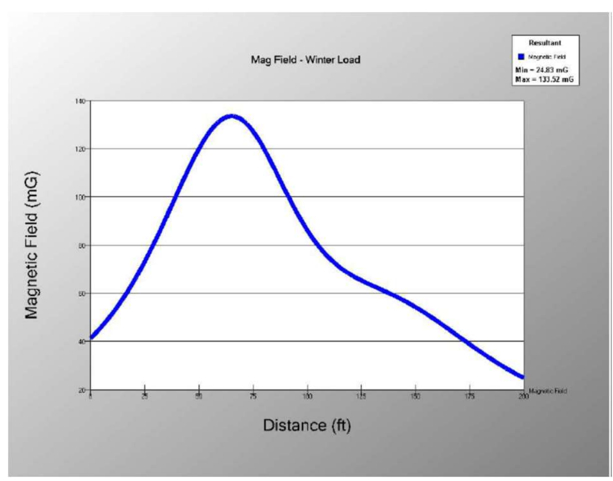

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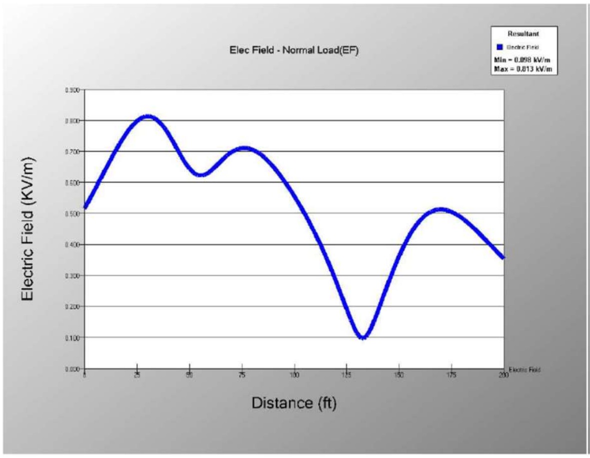

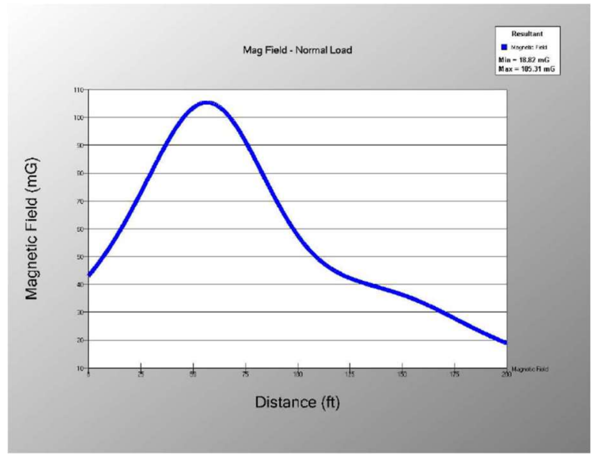

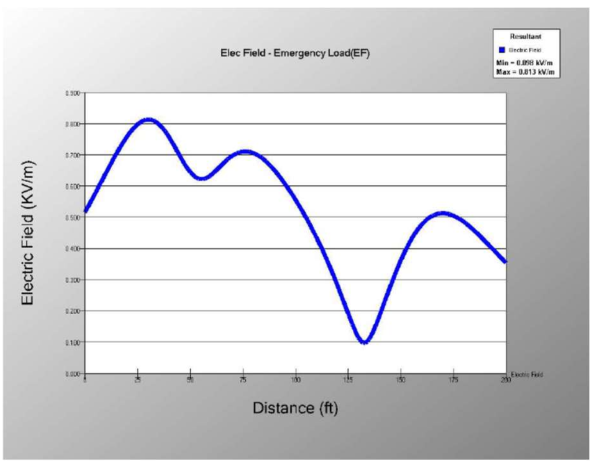

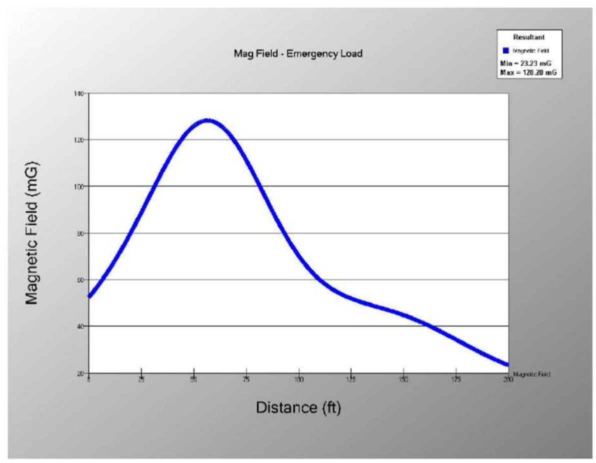

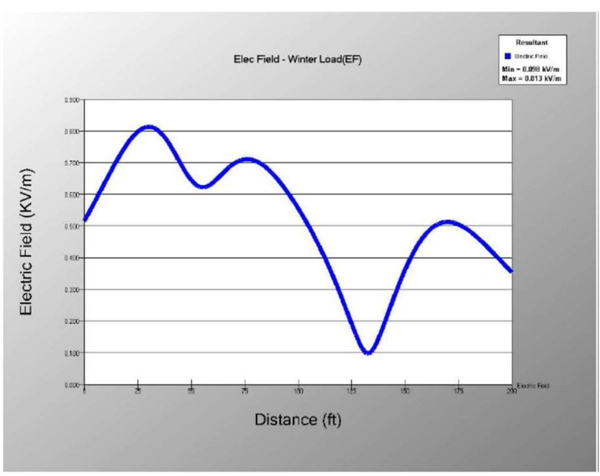

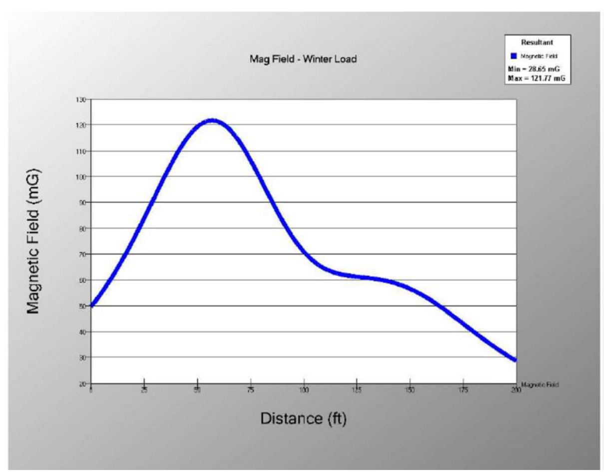

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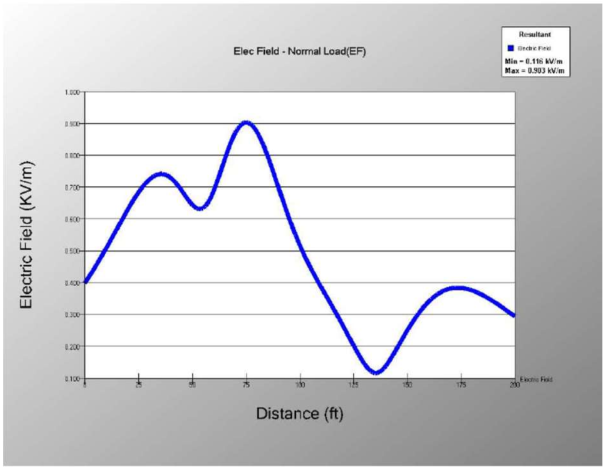

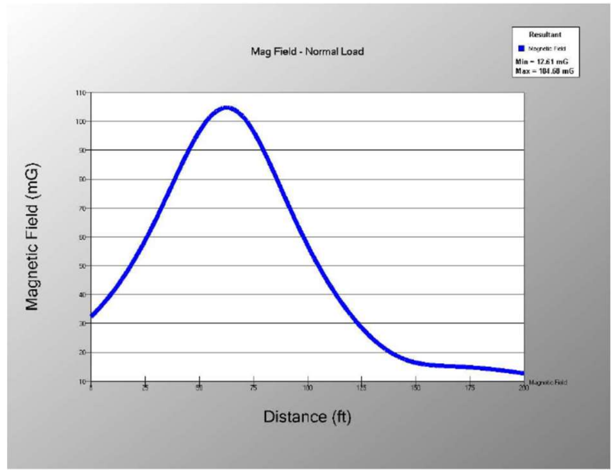

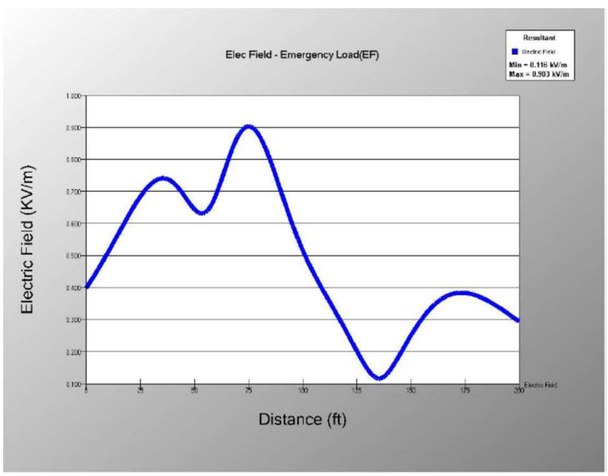

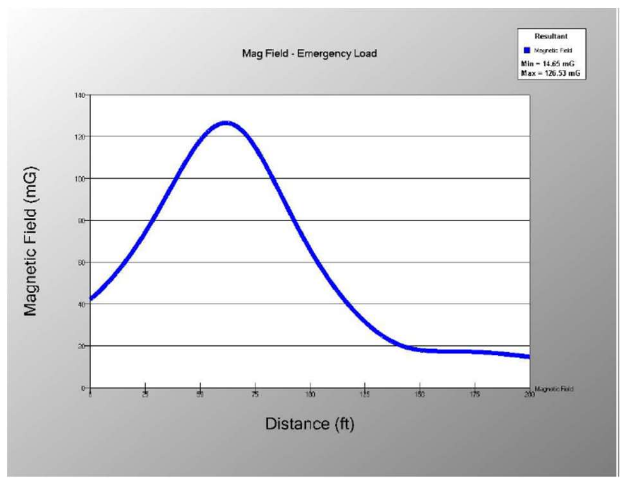

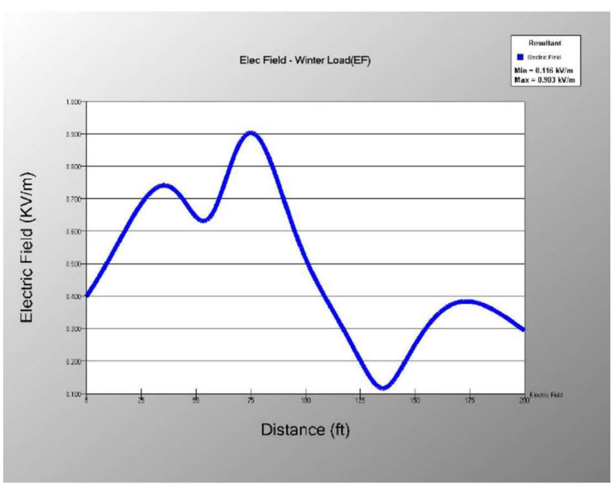

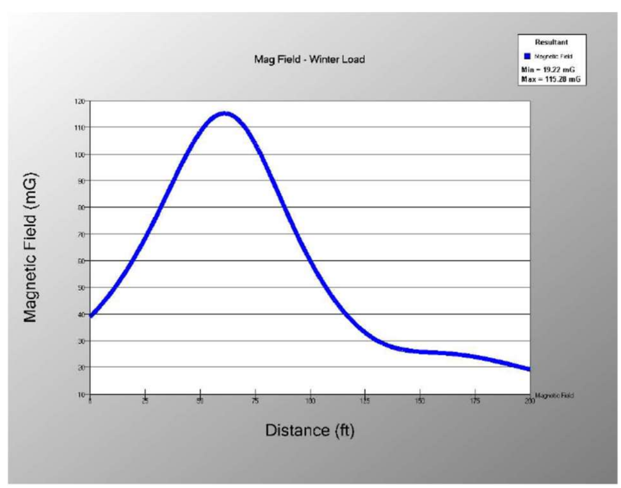

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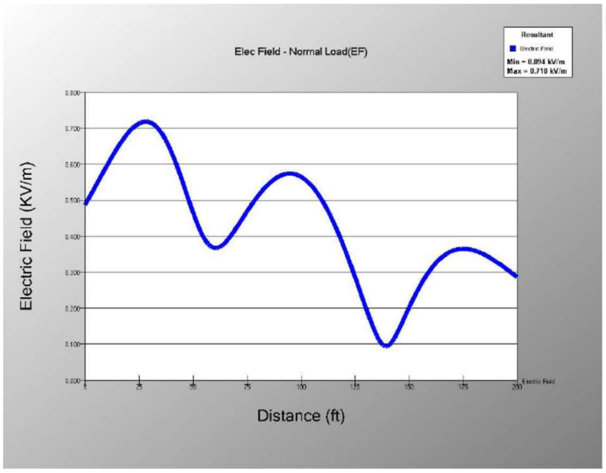

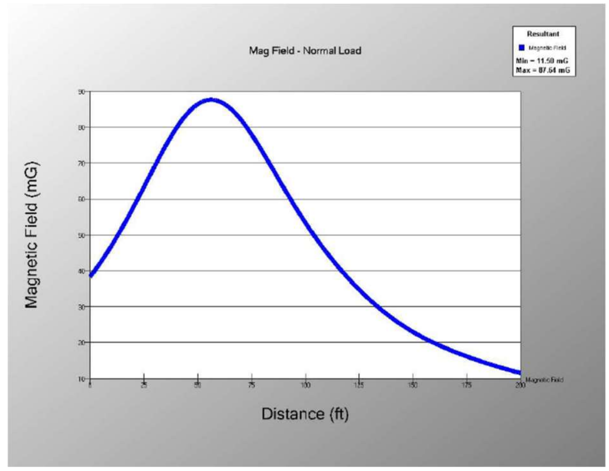

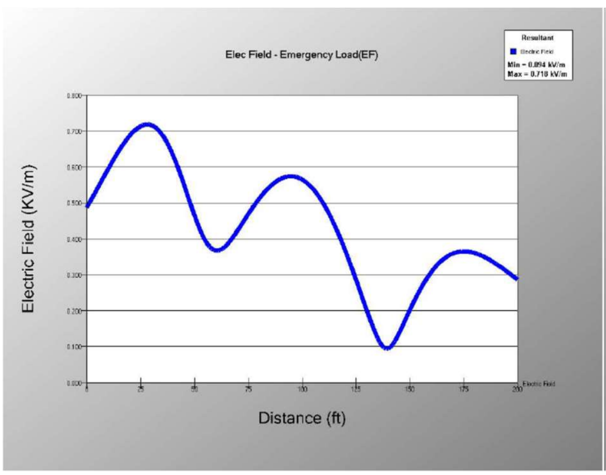

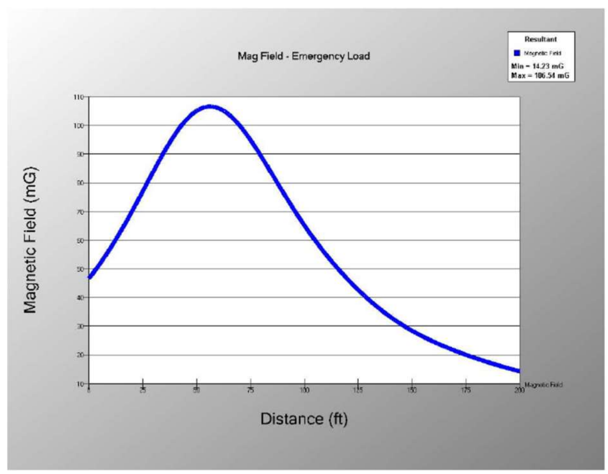

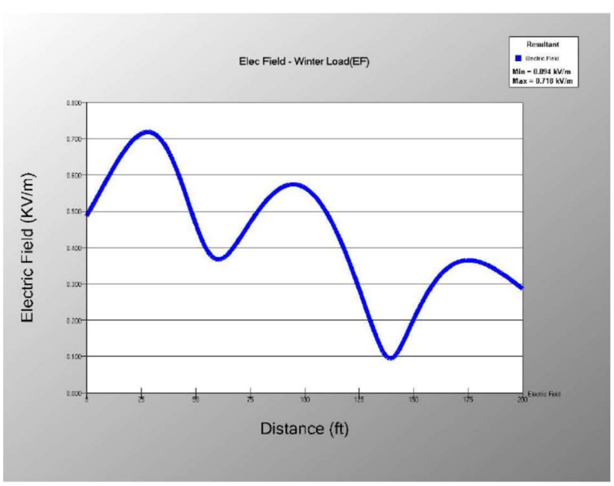

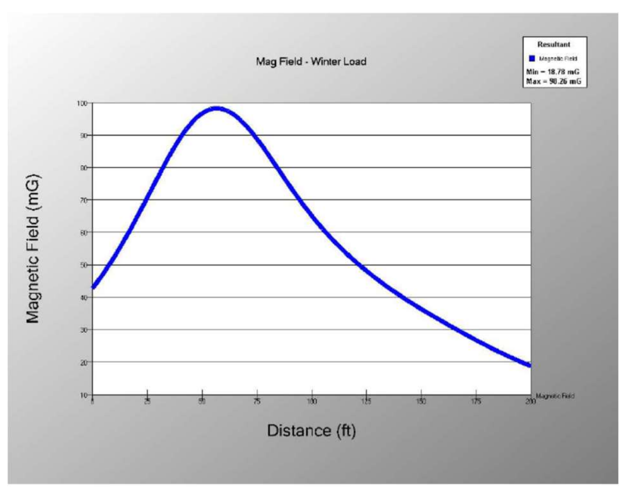

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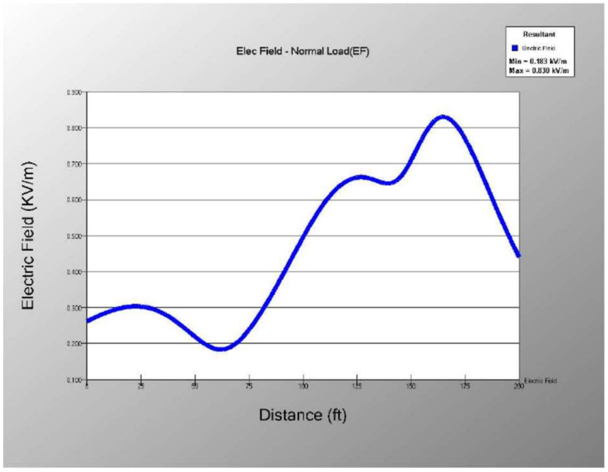

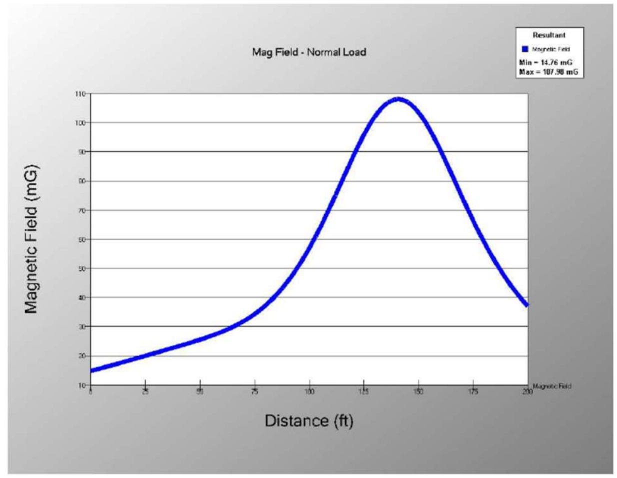

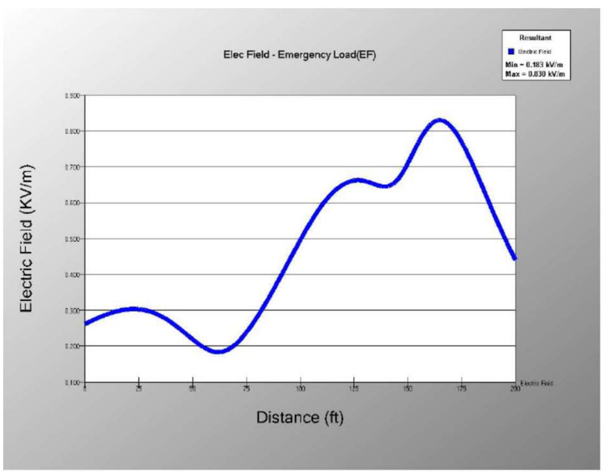

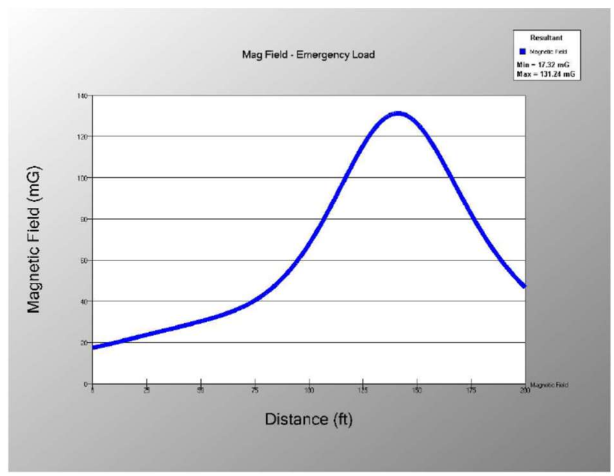

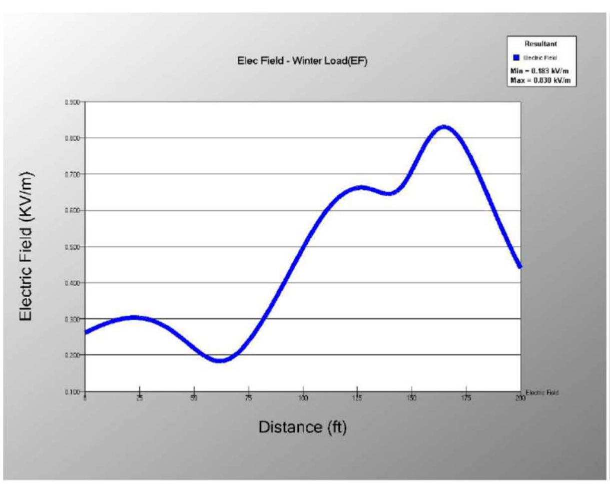

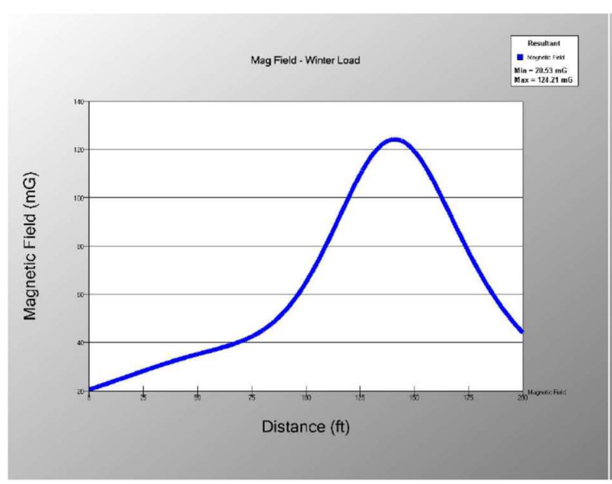

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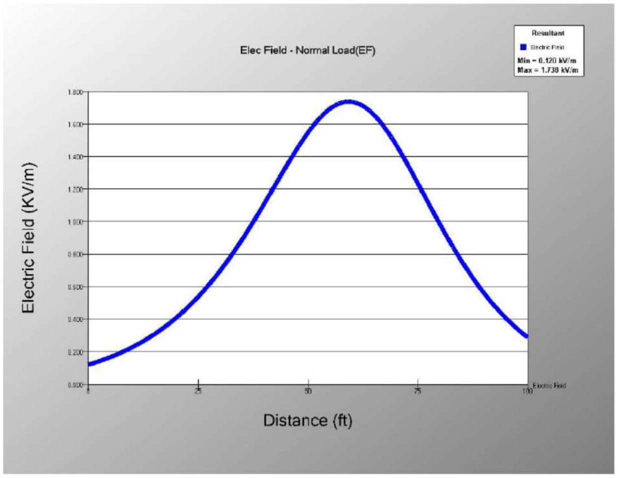
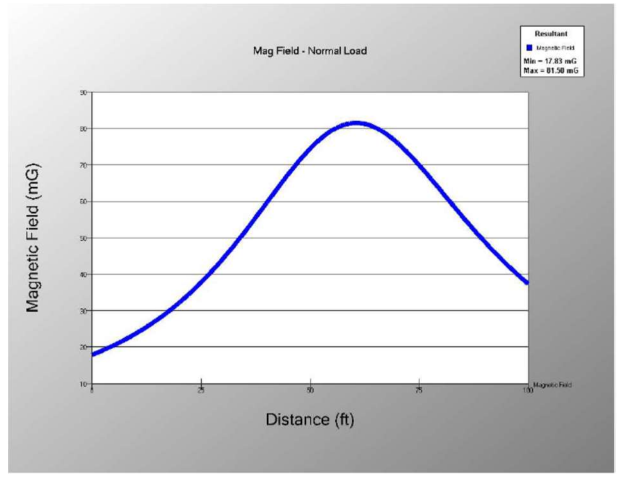
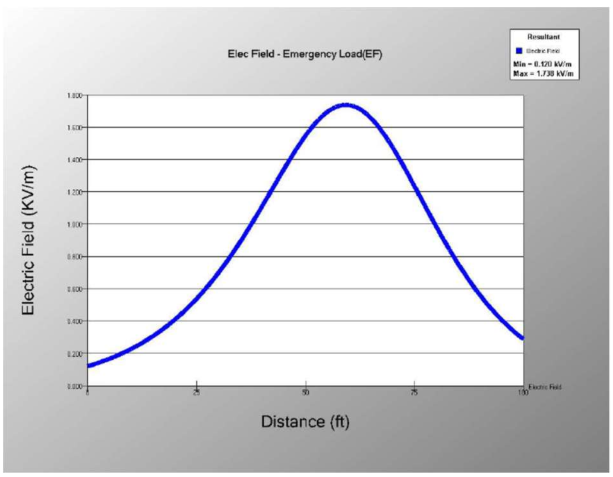
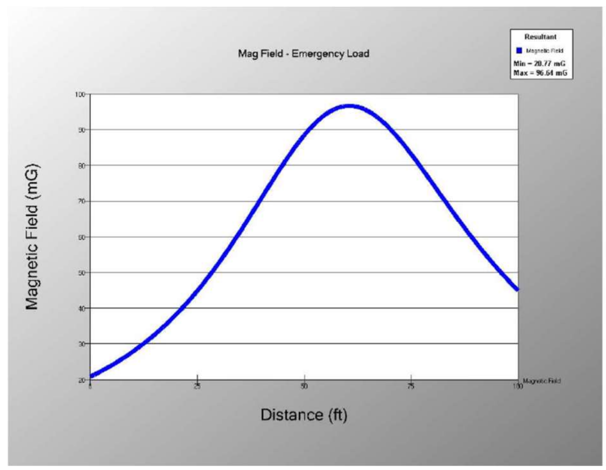
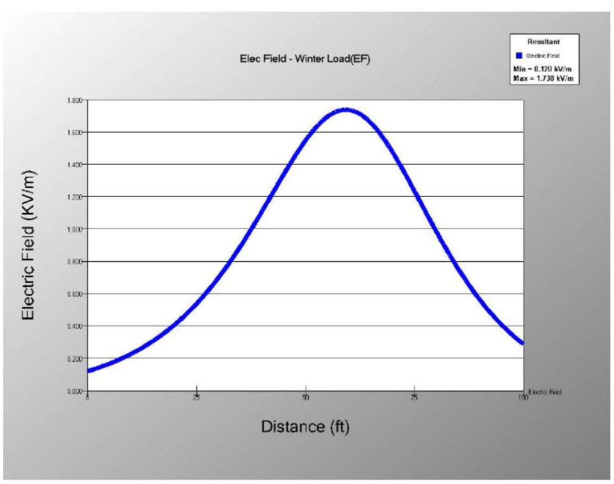
For Table 7-11

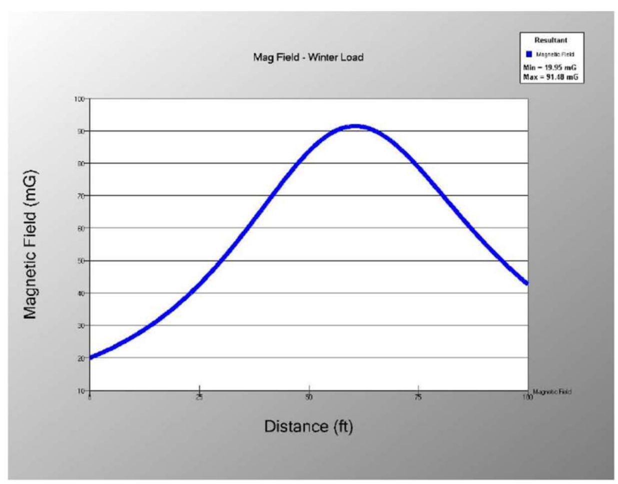












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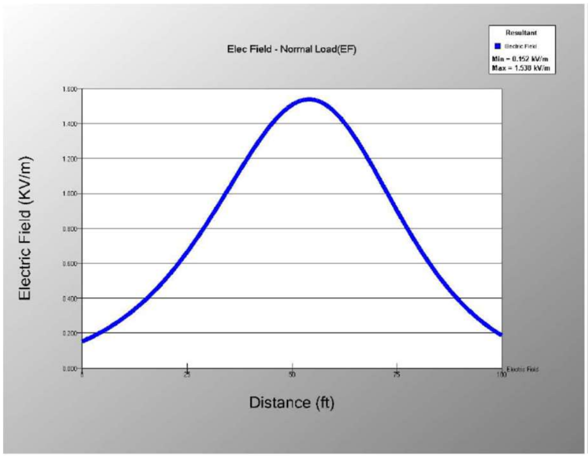
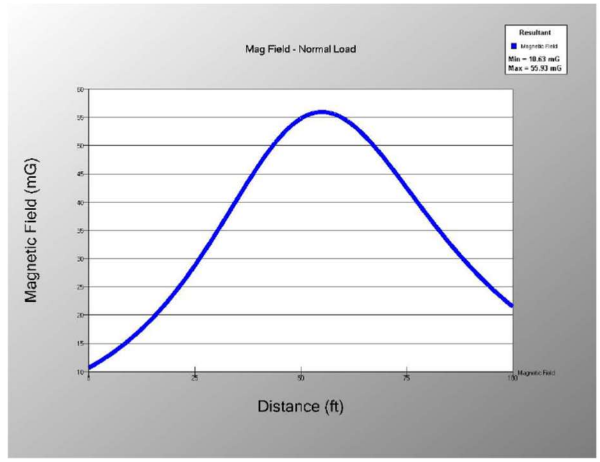
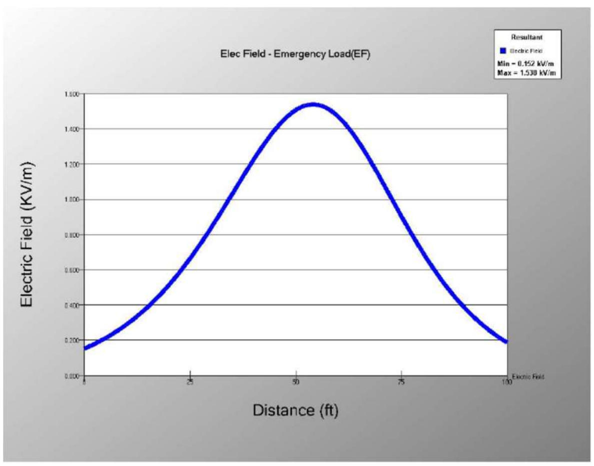
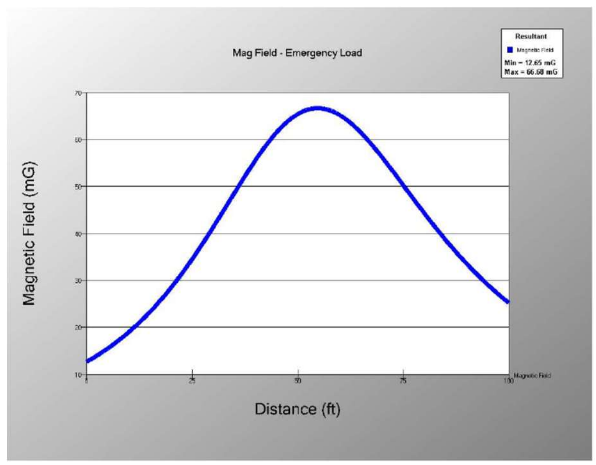
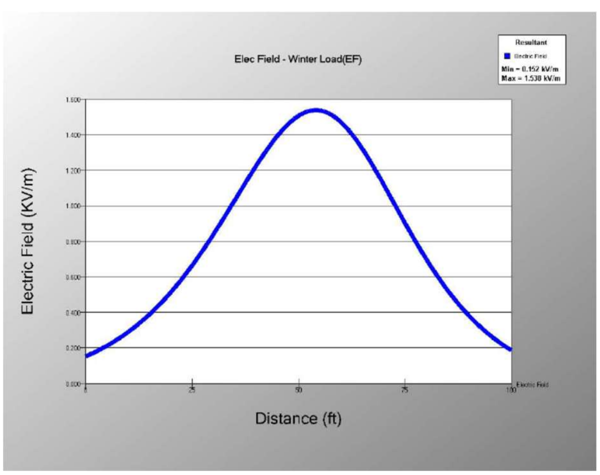
For Table 7-12

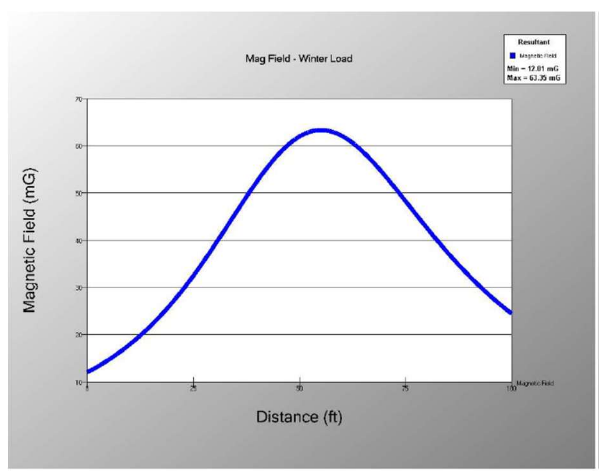












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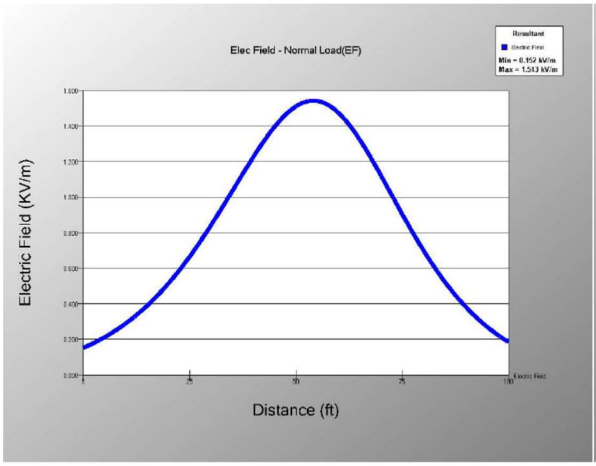

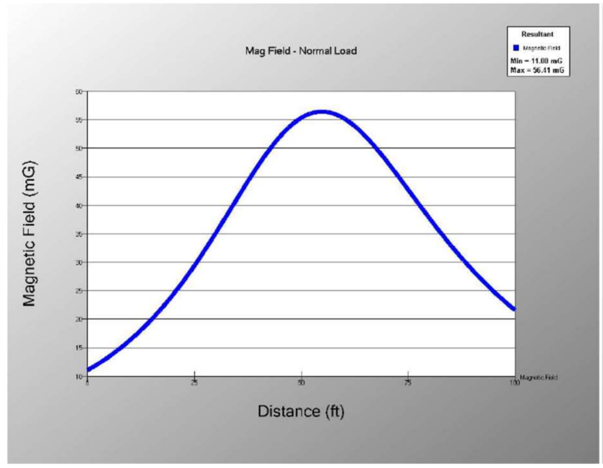

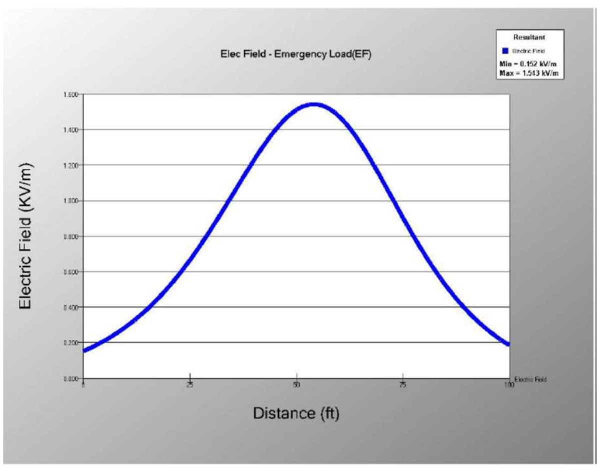

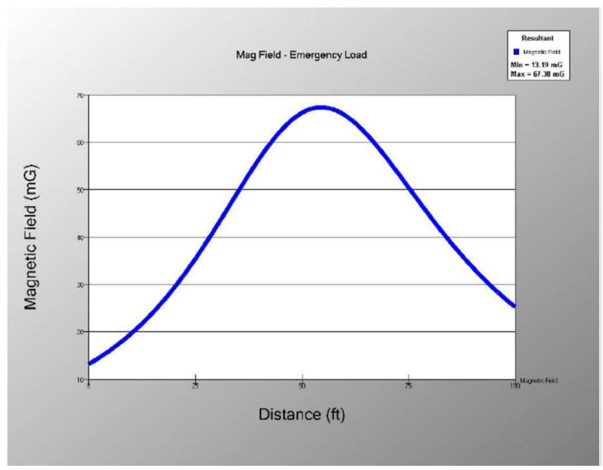

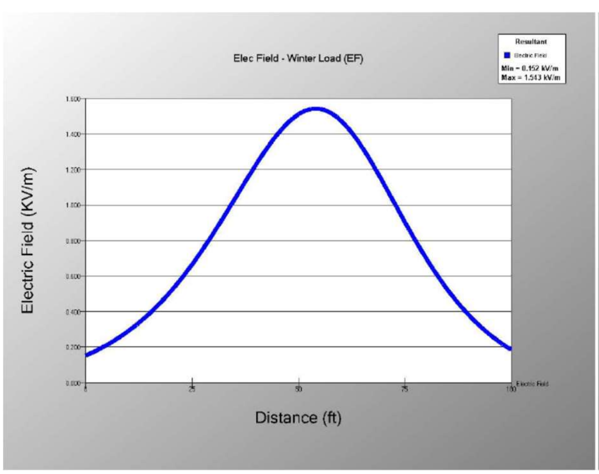

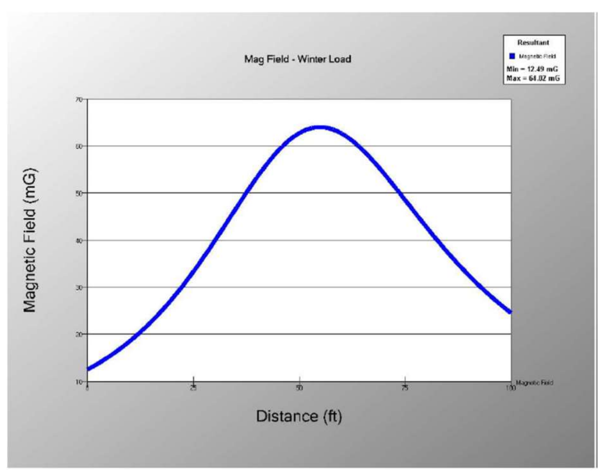

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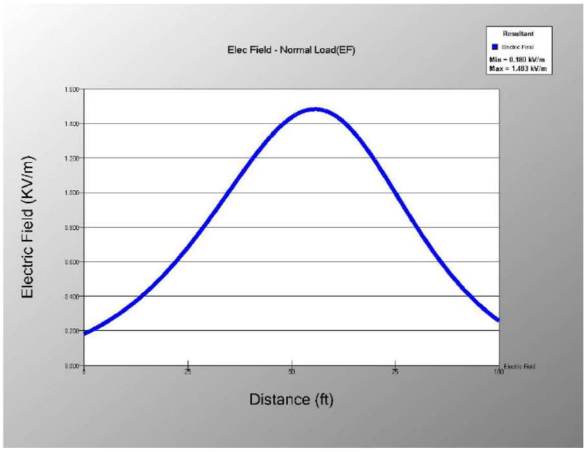

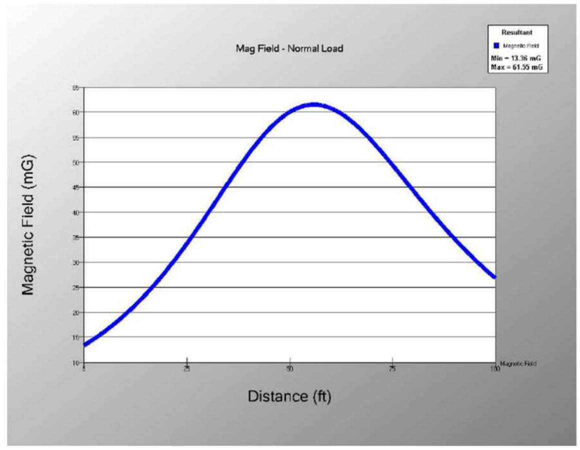

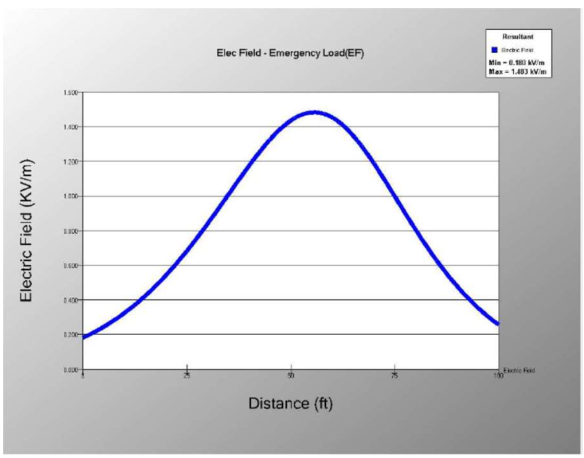

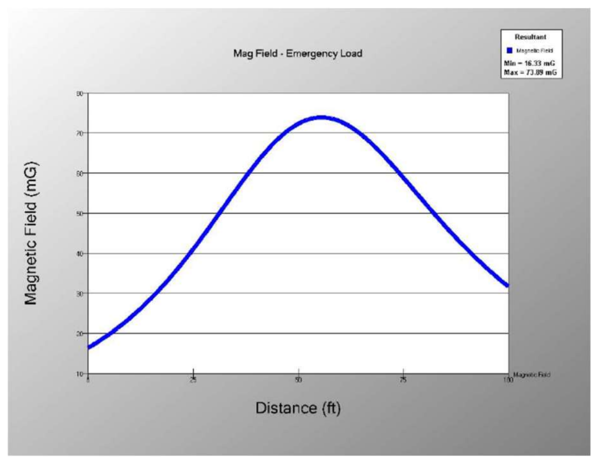

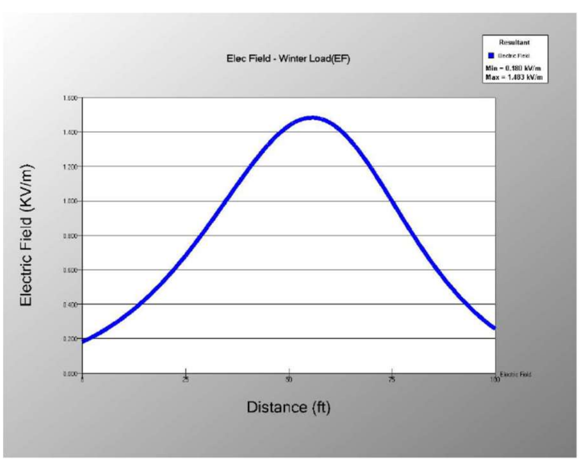

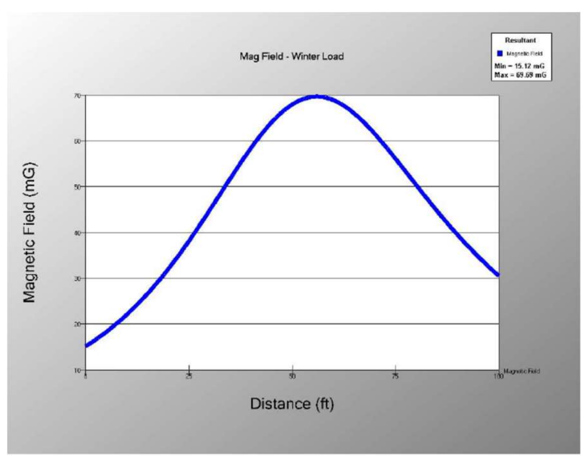

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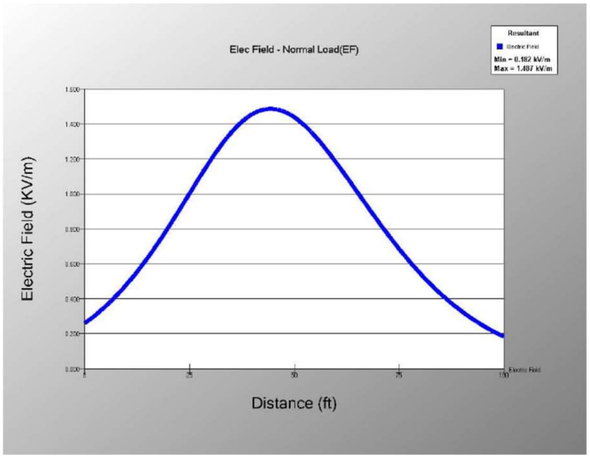
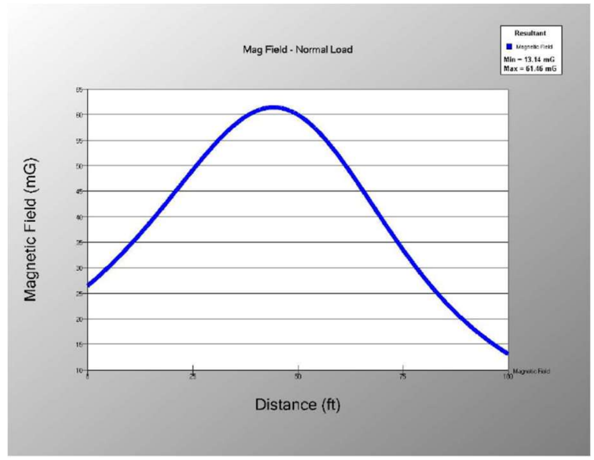
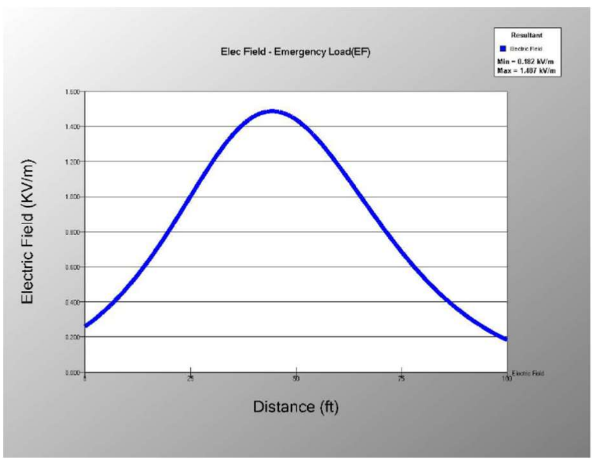
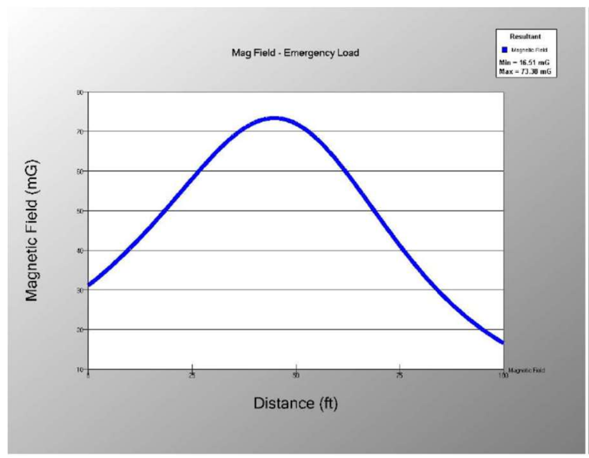
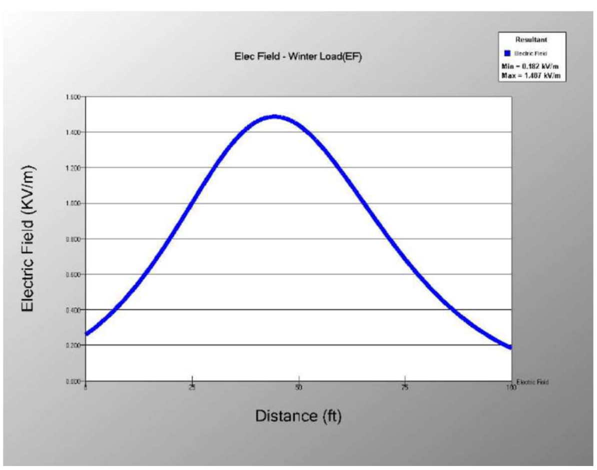
For Table 7-15

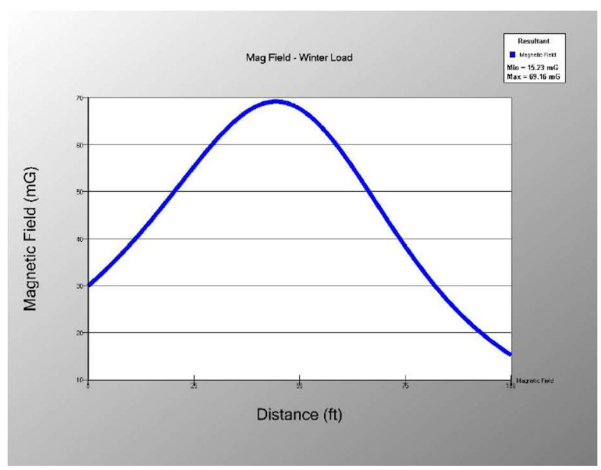












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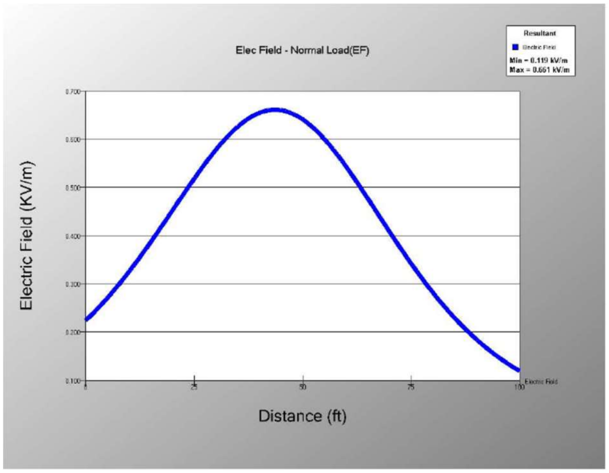
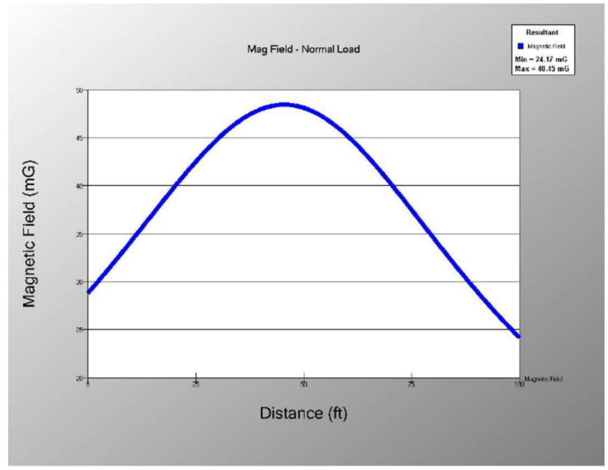
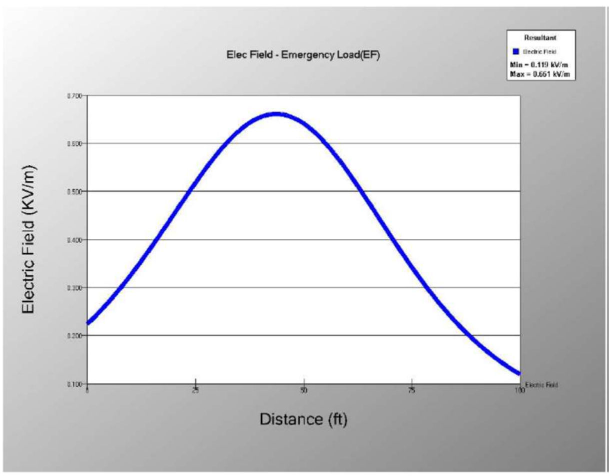
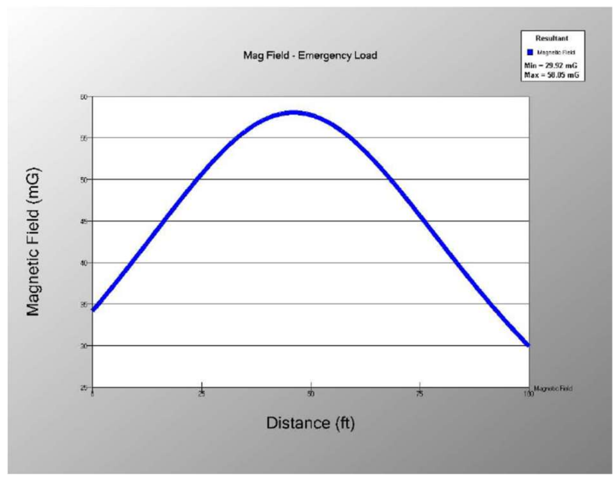
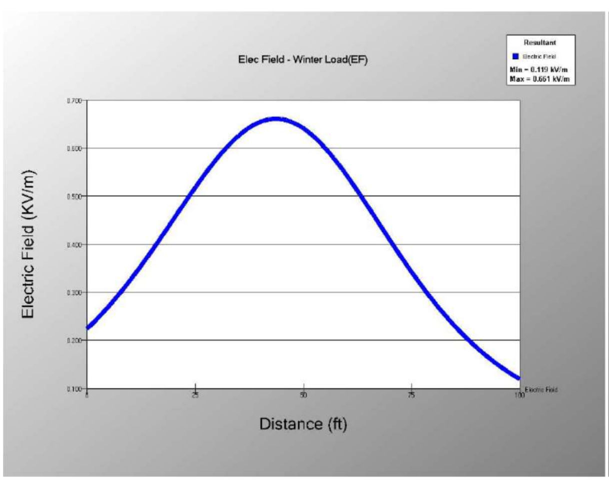
For Table 7-16

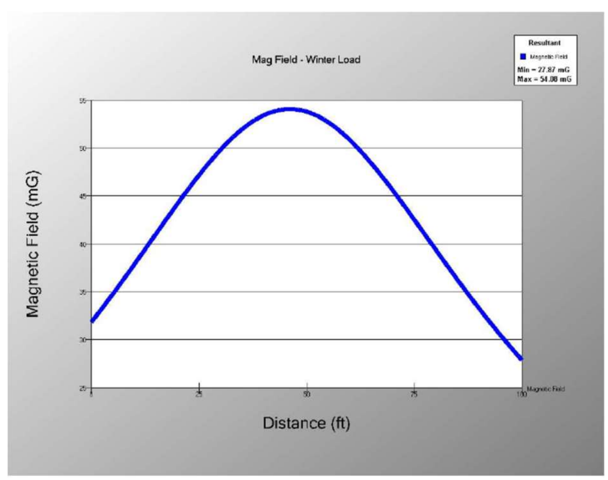












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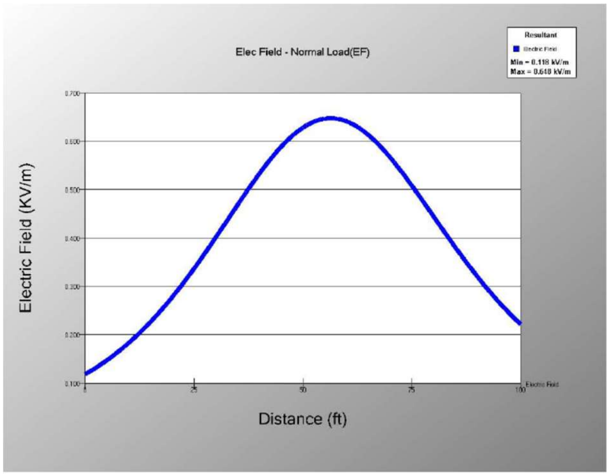
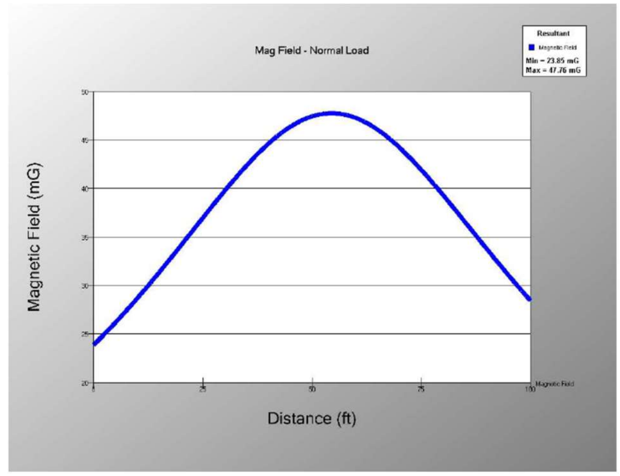
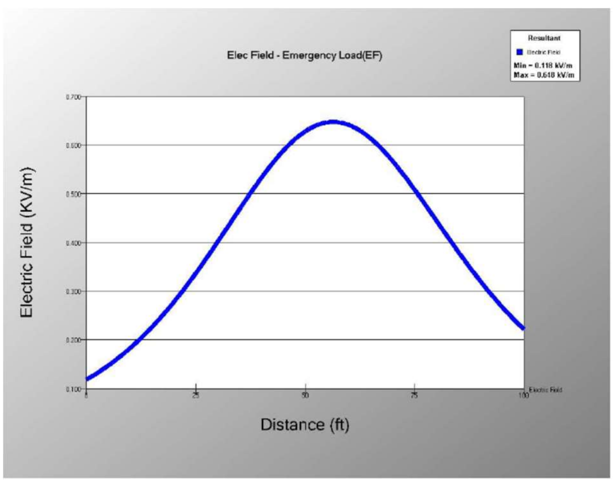
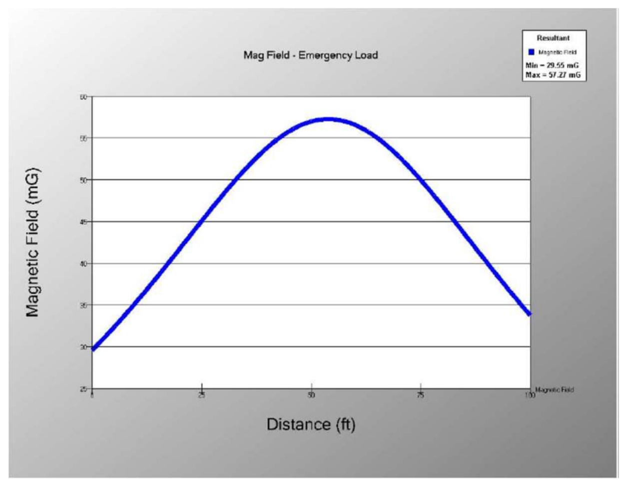
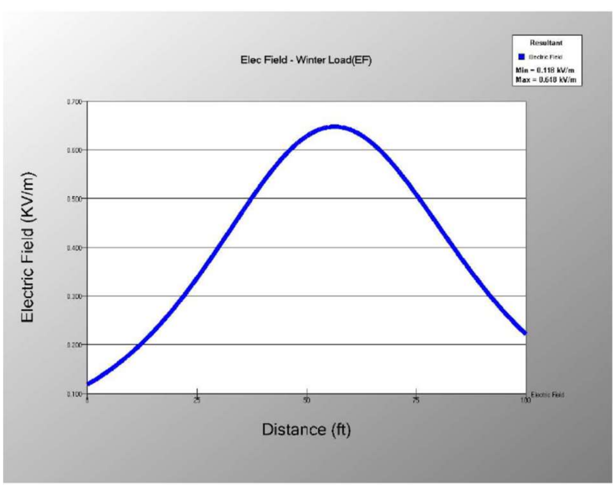
For Table 7-17

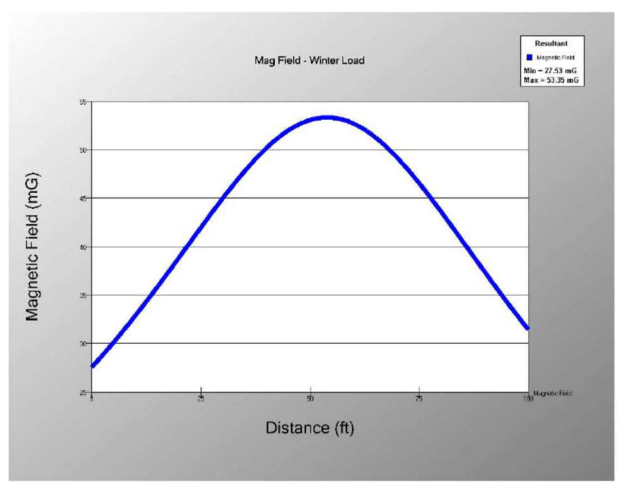












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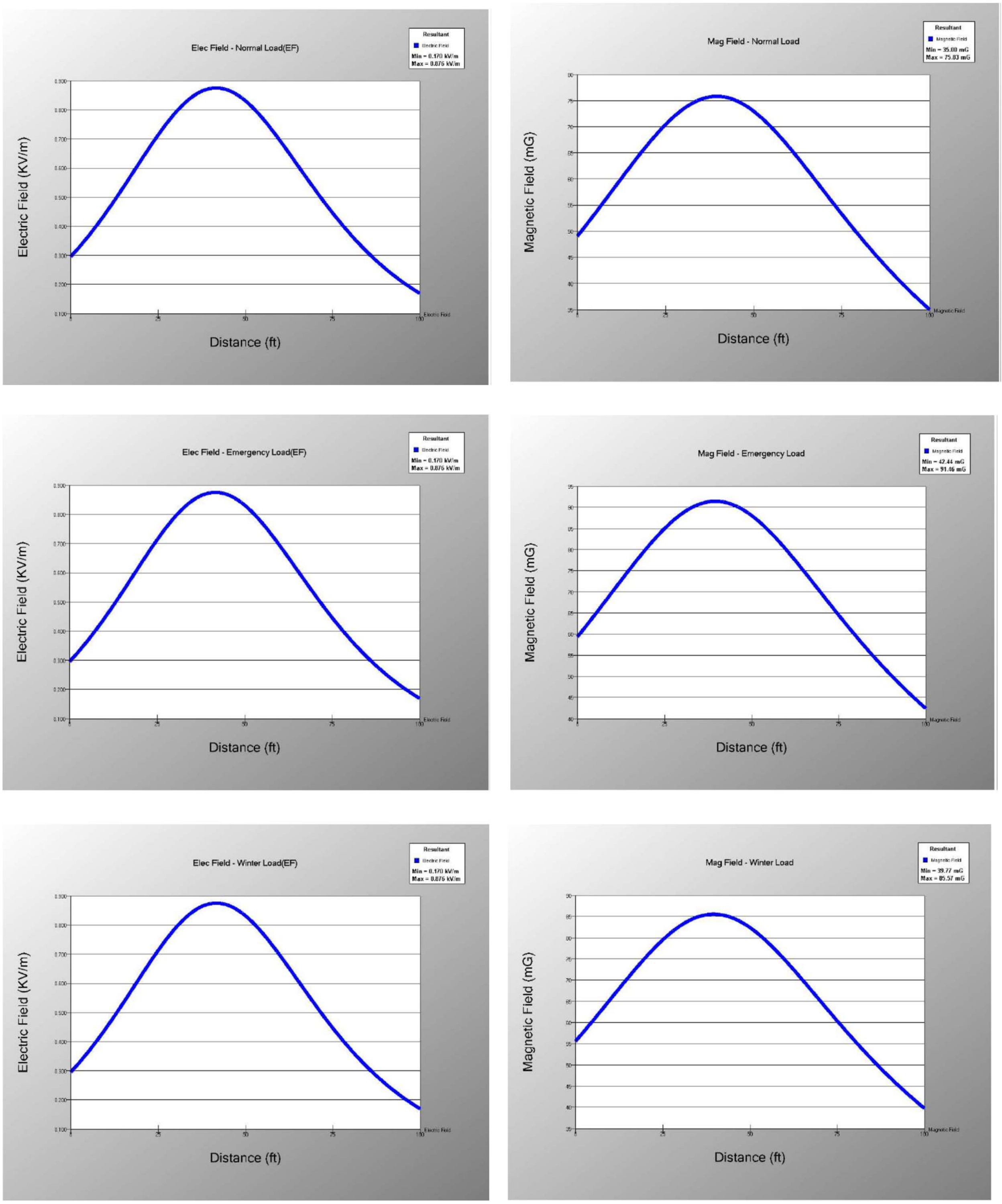
For Table 7-18



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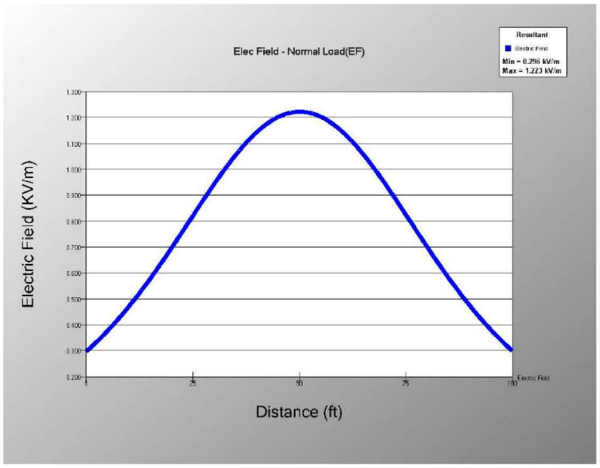

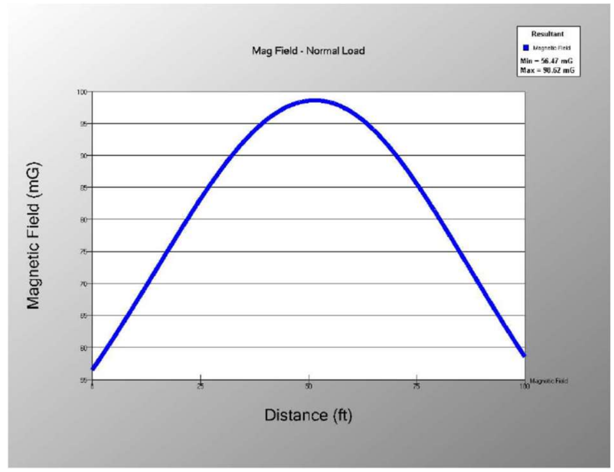

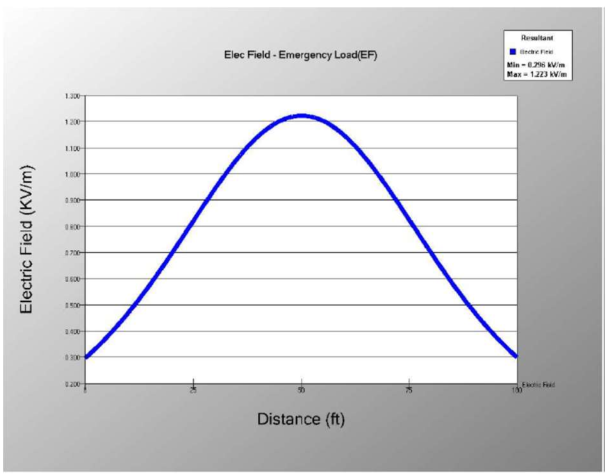

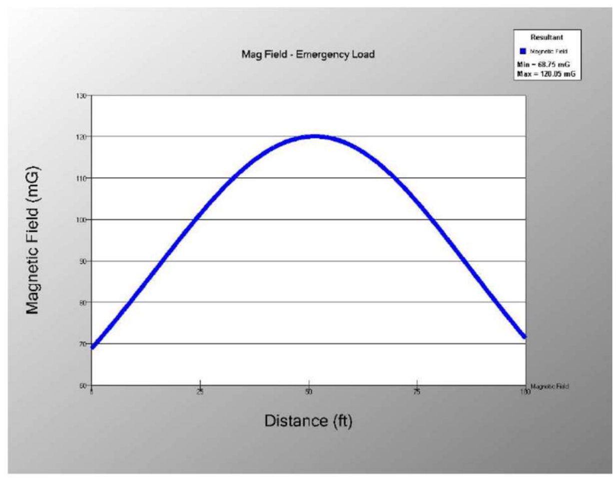

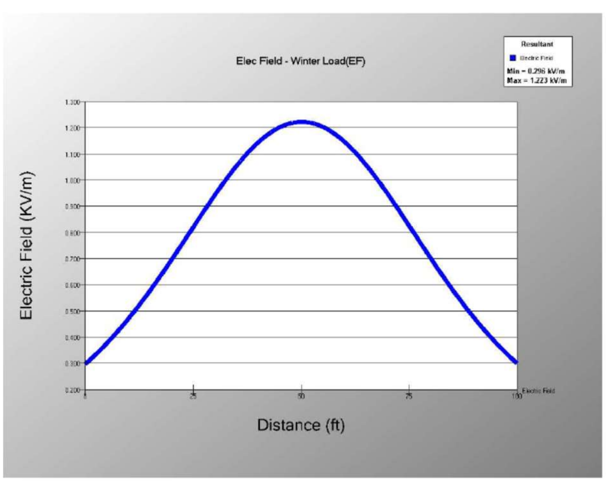

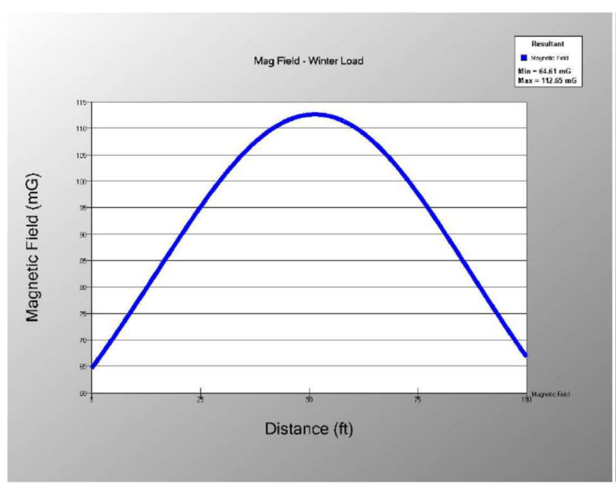

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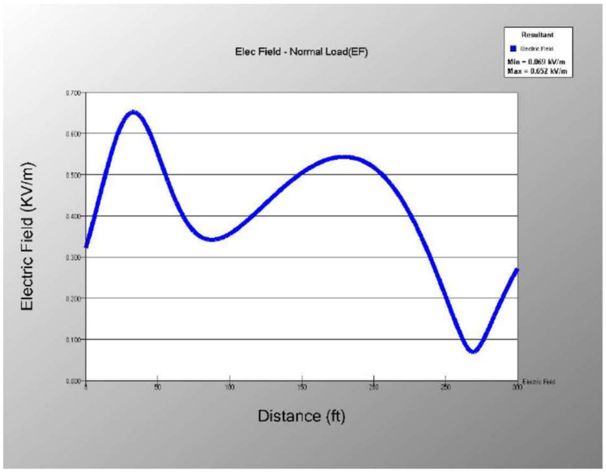
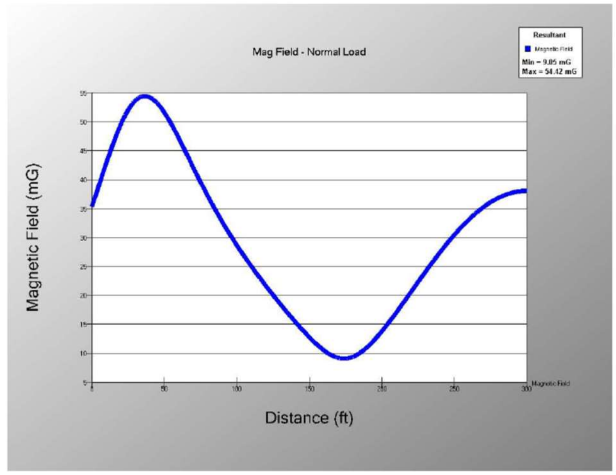
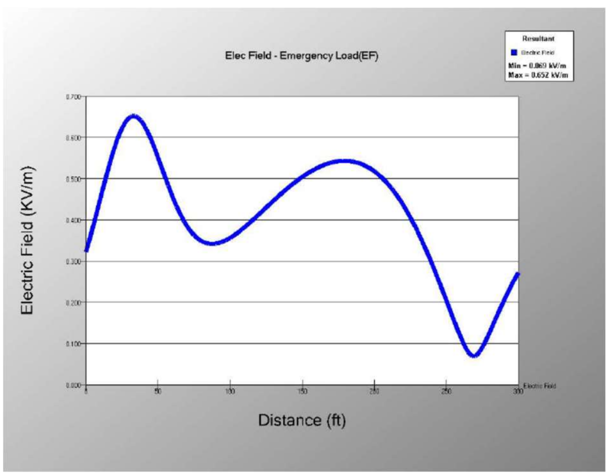
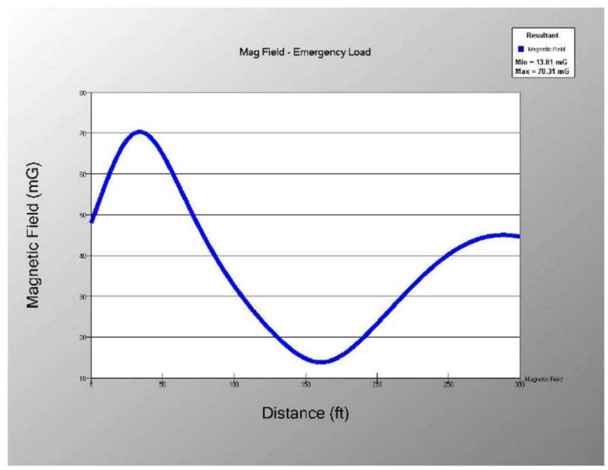
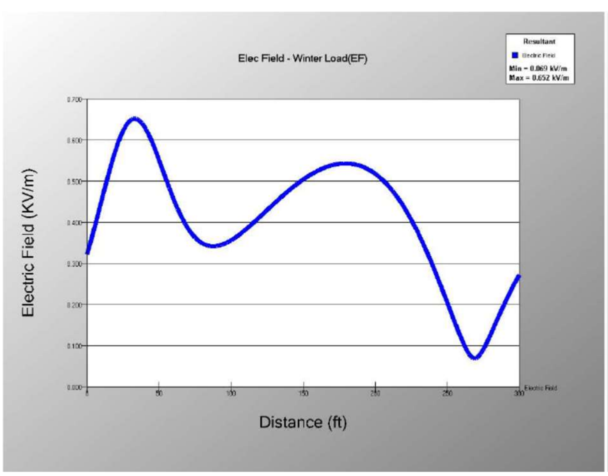
For Table 7-20

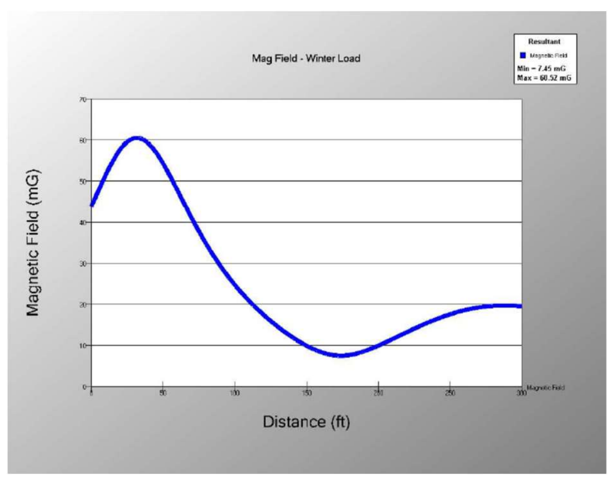












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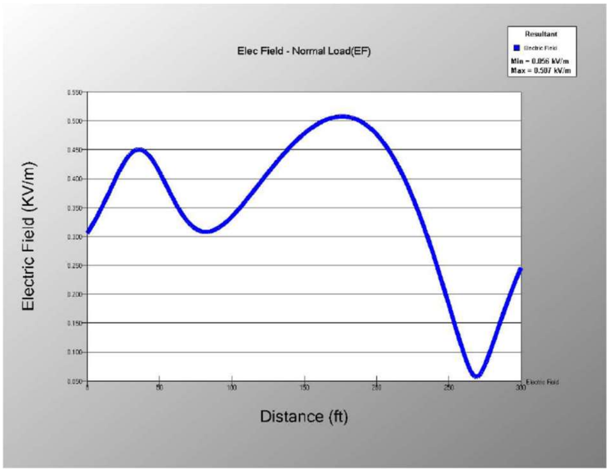

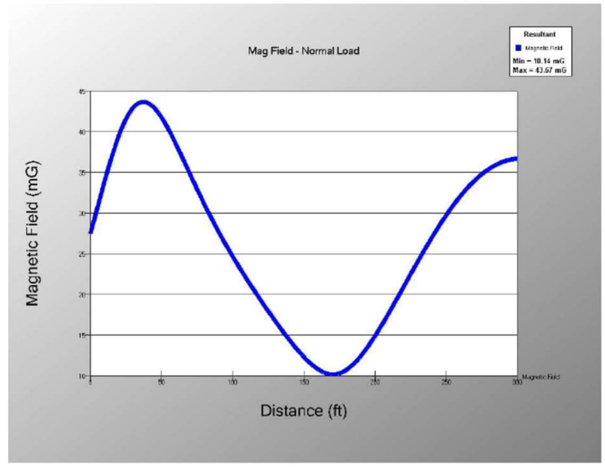

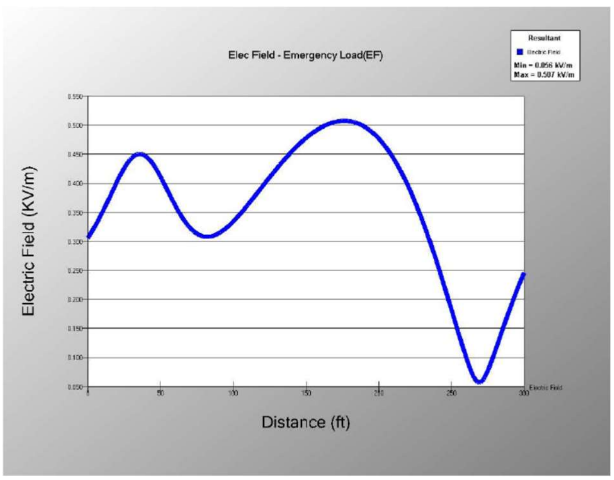

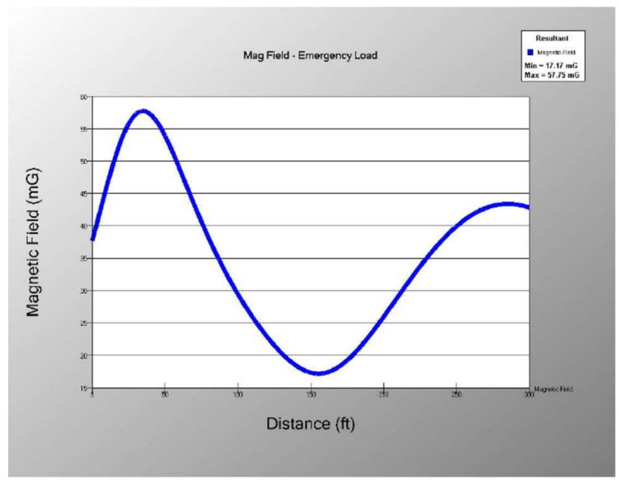

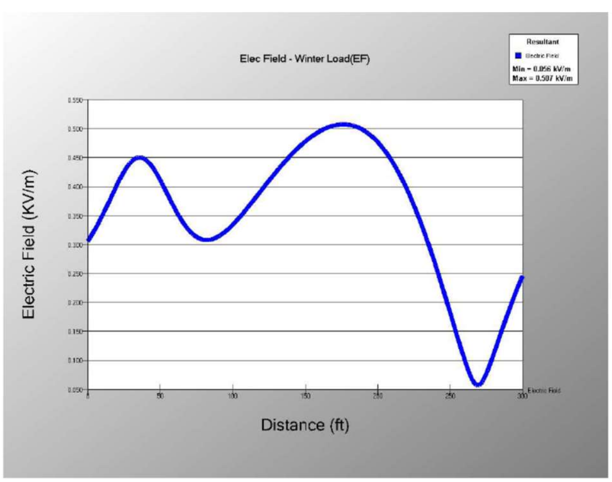

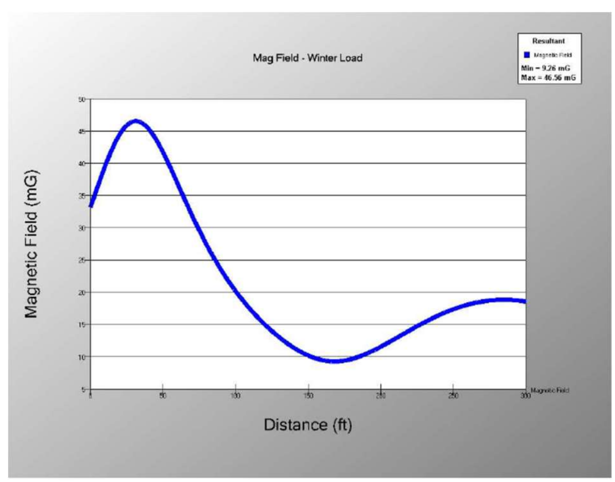

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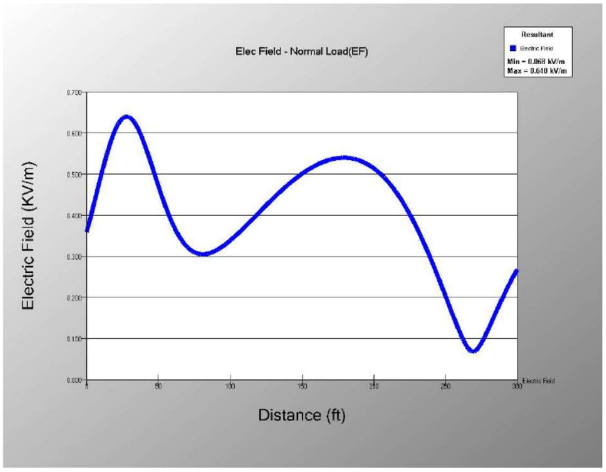

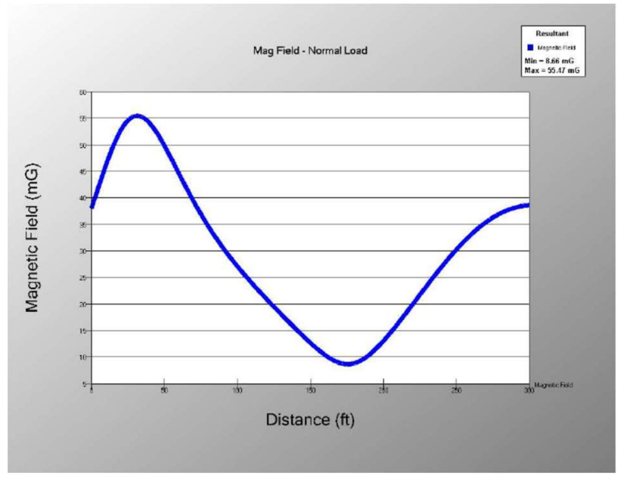

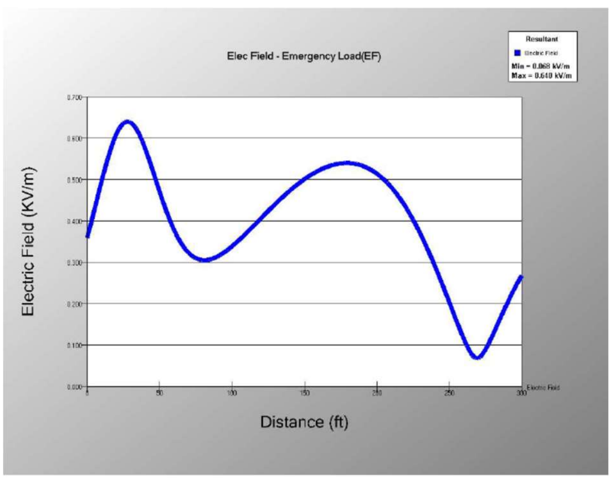

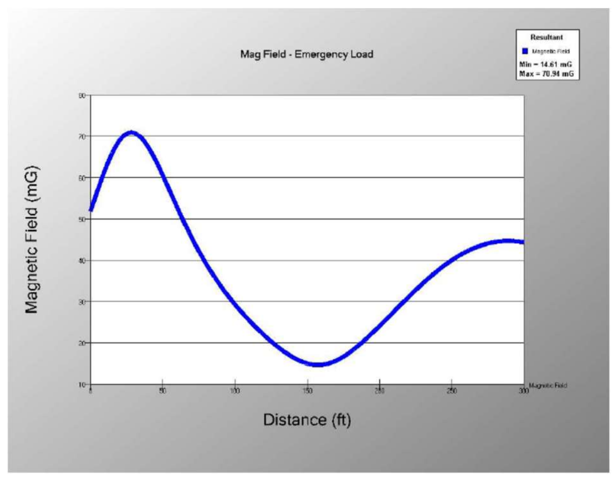

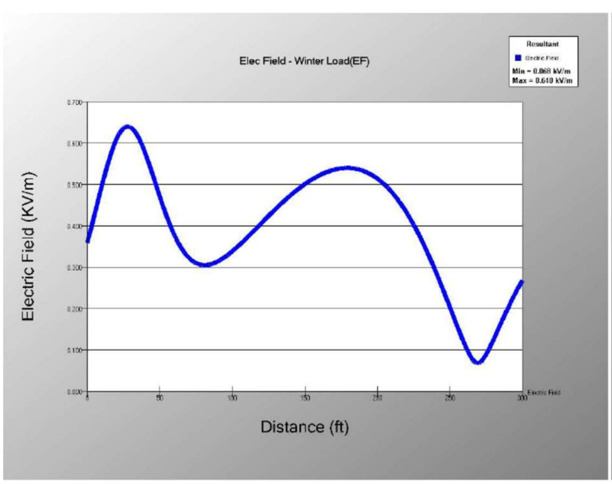

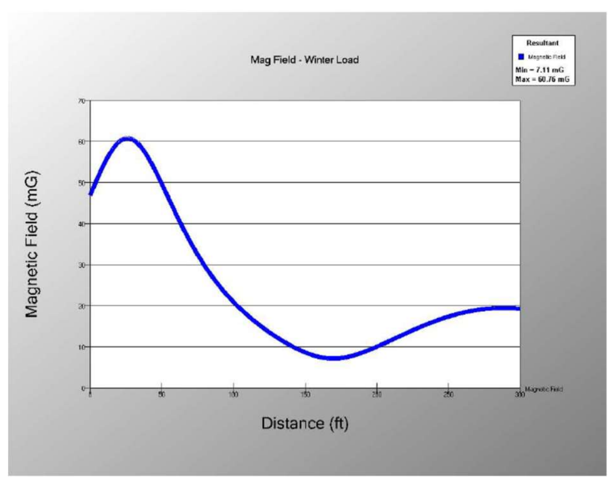

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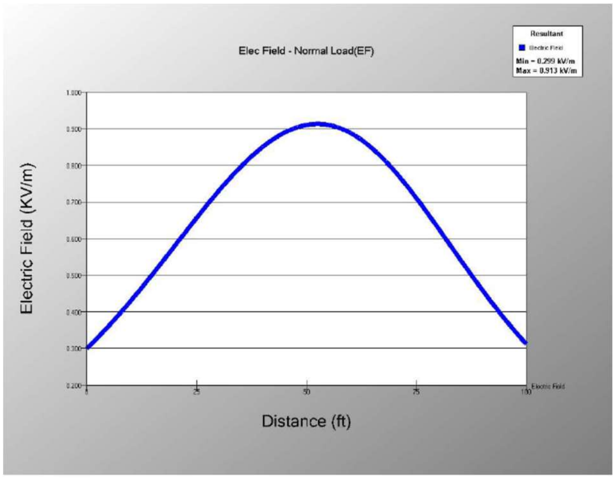

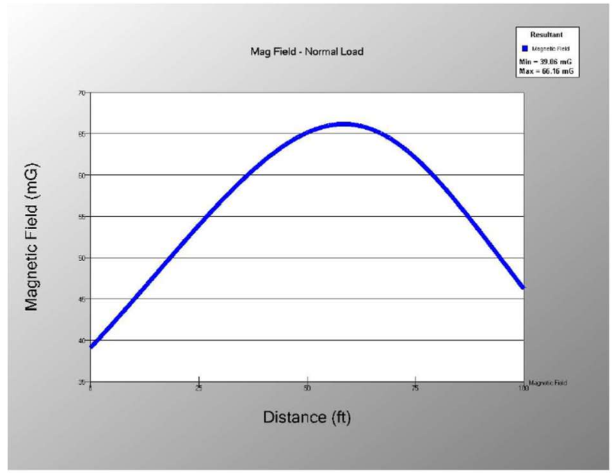

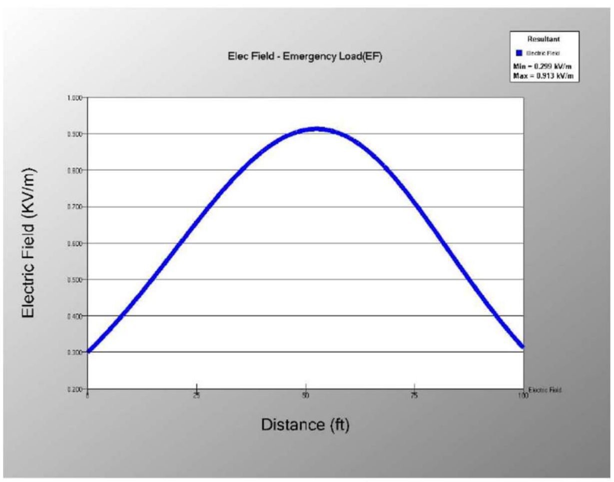

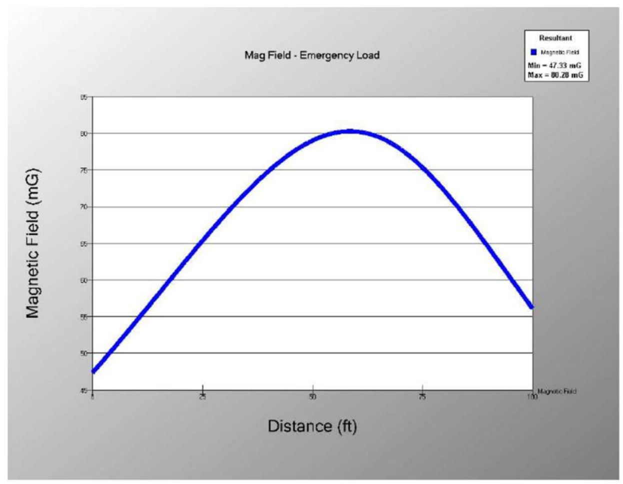

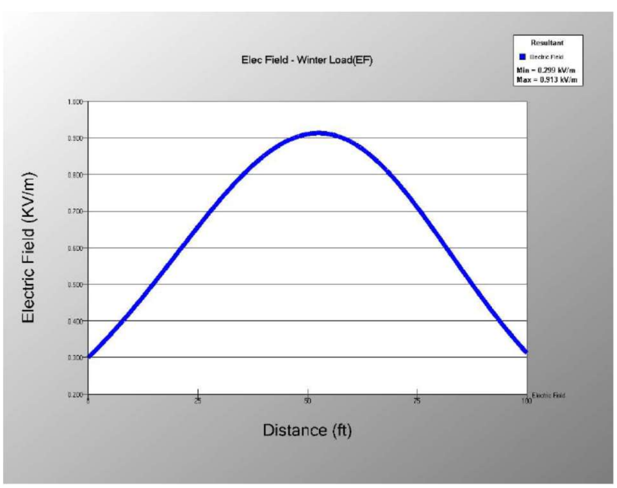

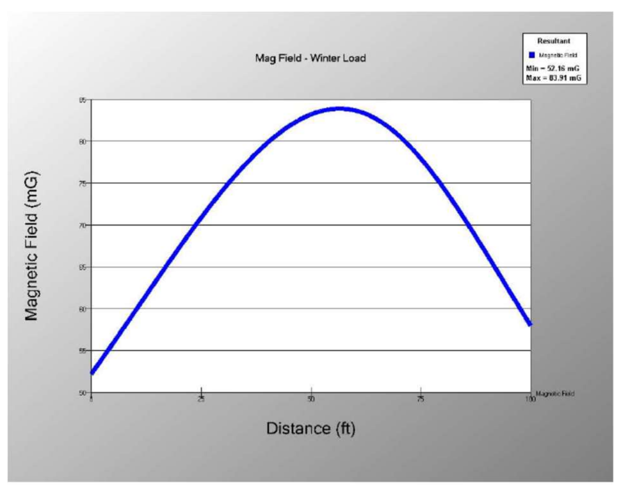

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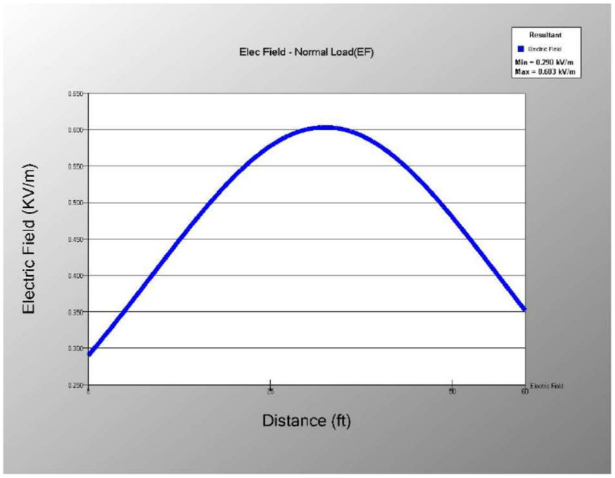
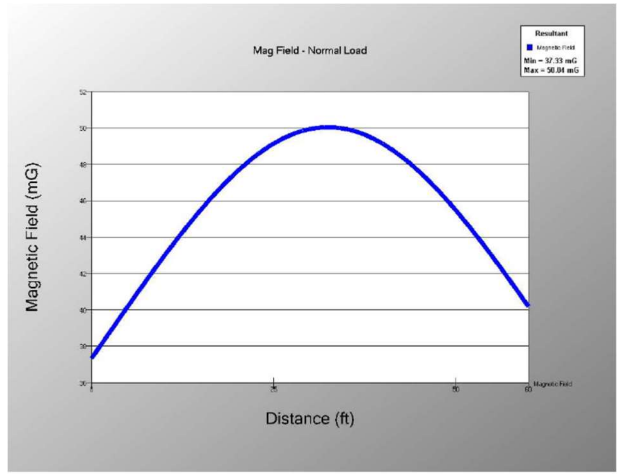
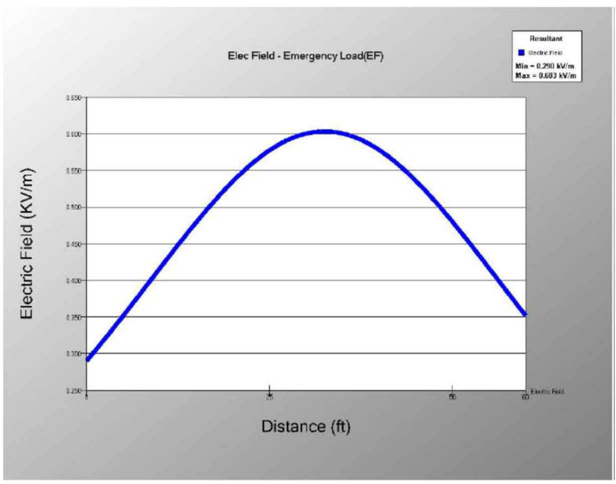
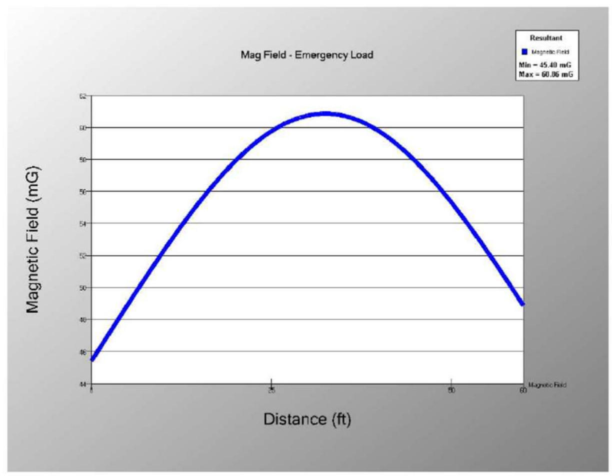
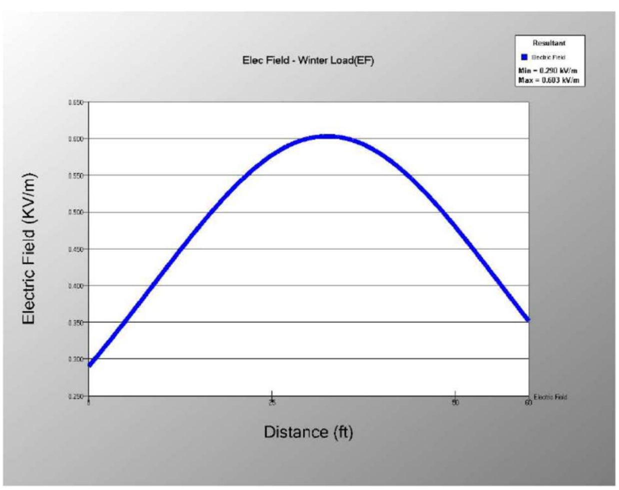
For Table 7-24

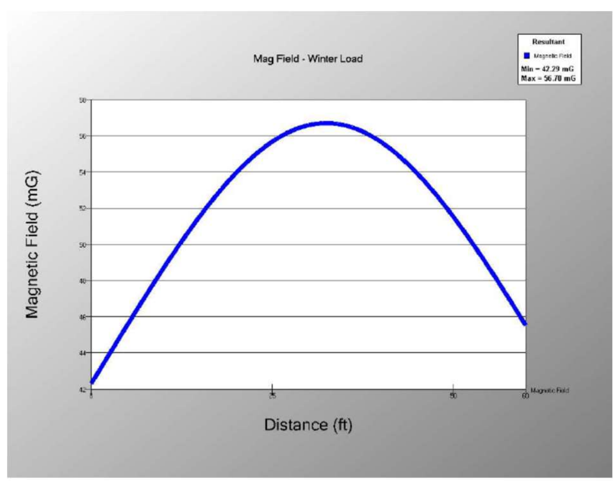












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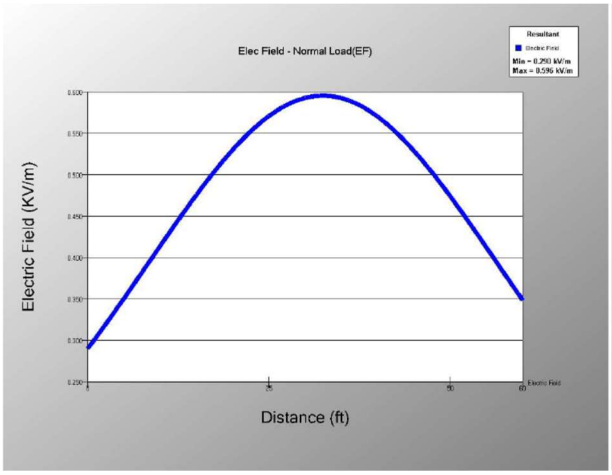
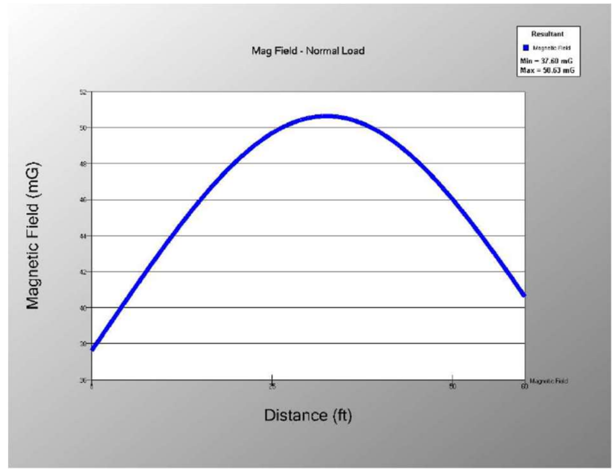
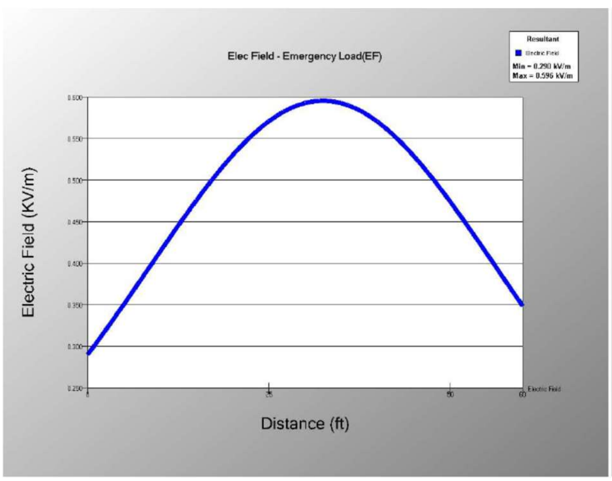
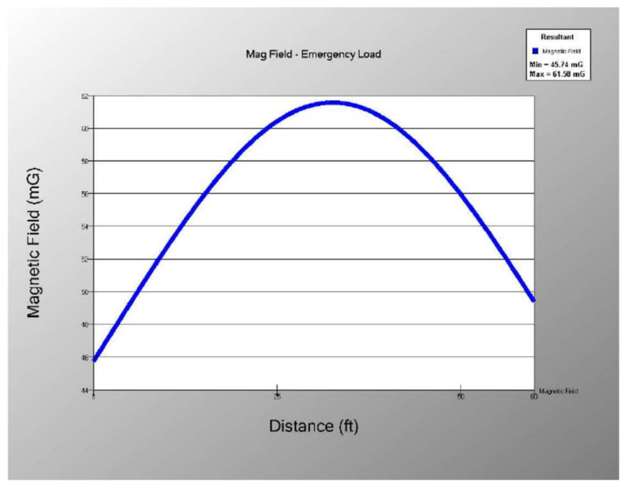
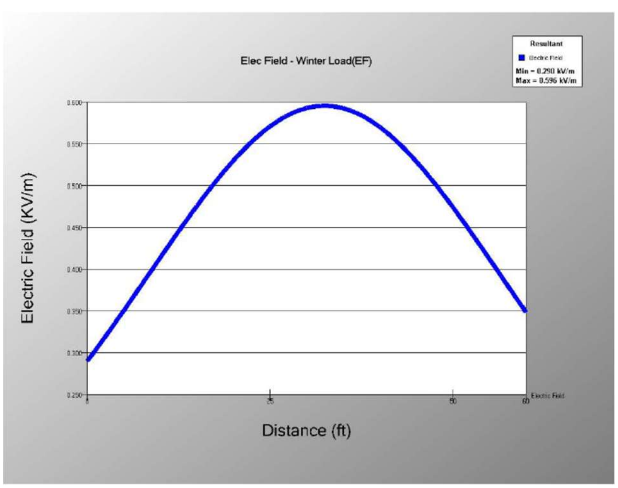
For Table 7-25

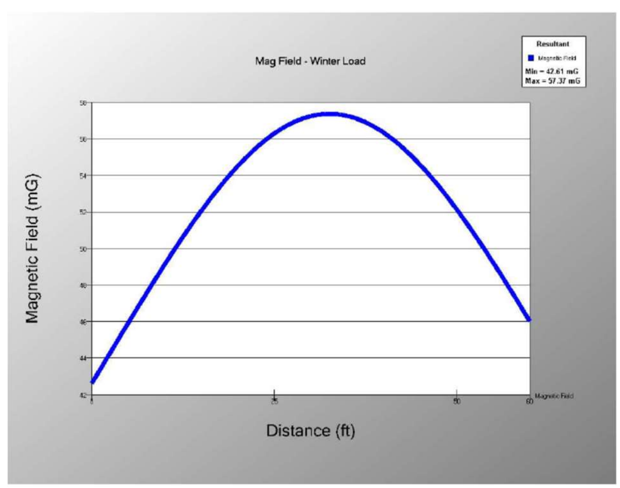












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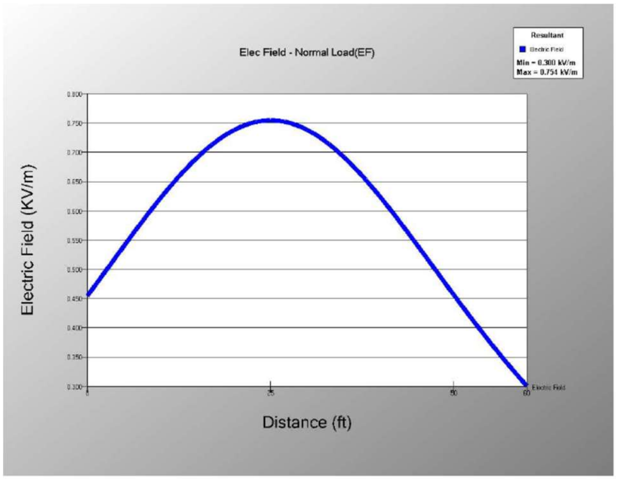

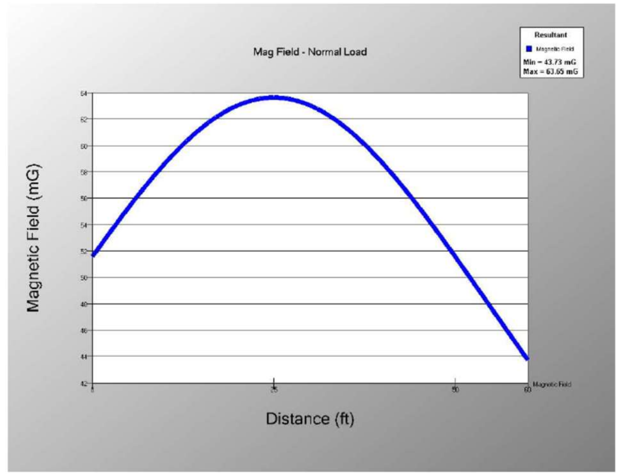

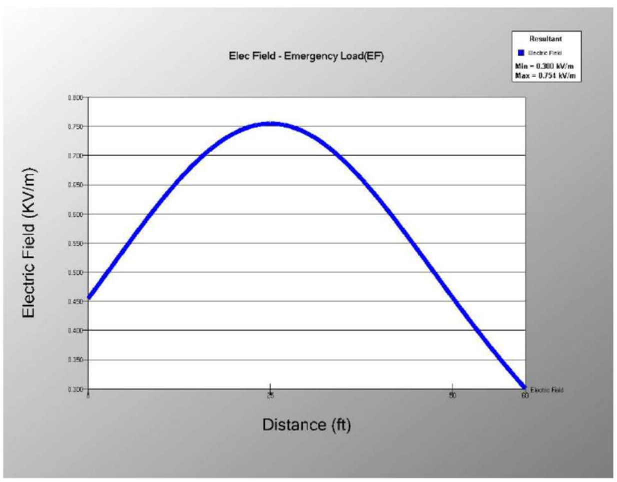

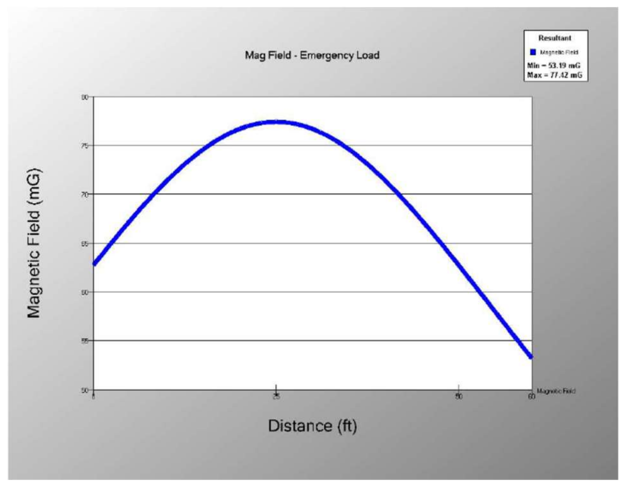

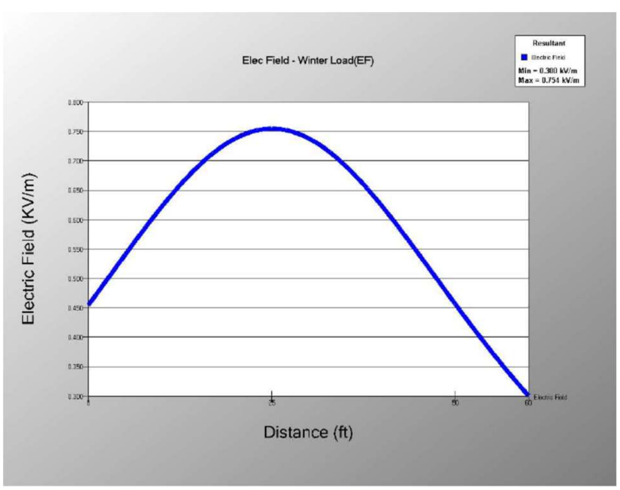

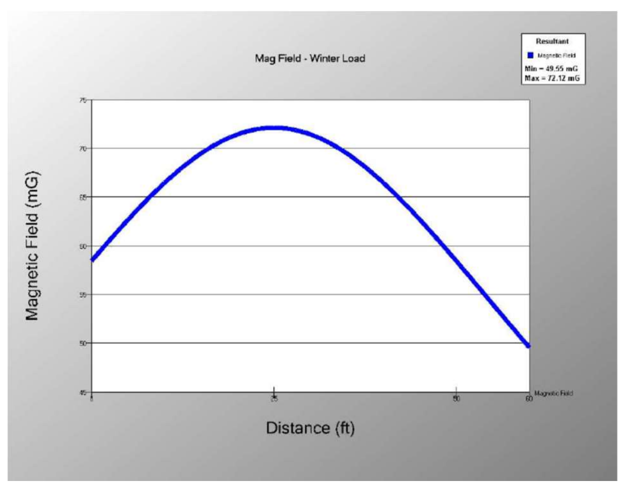

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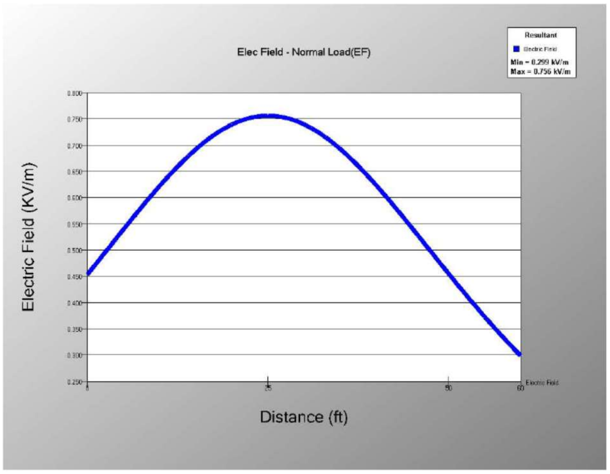

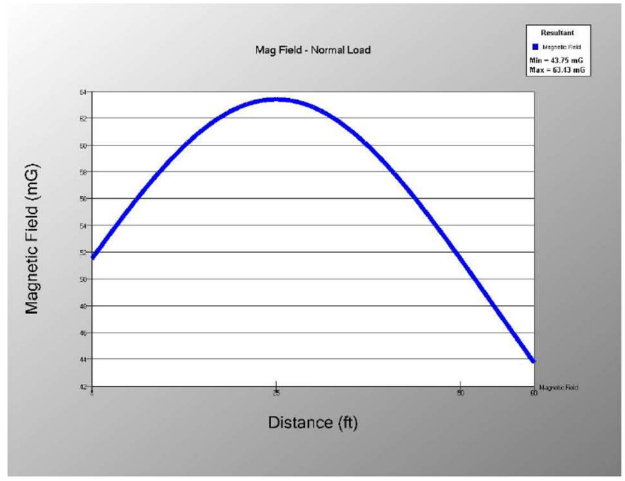

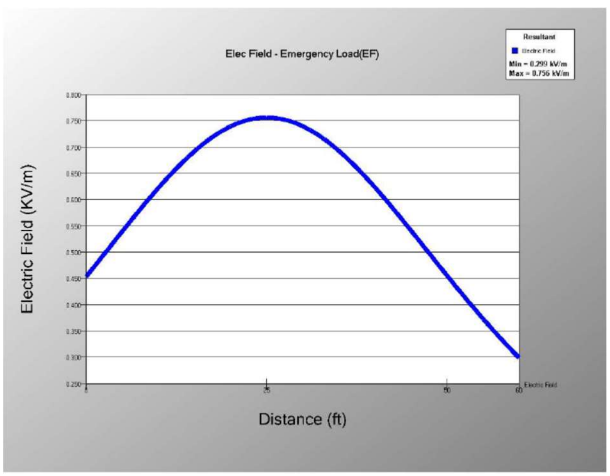

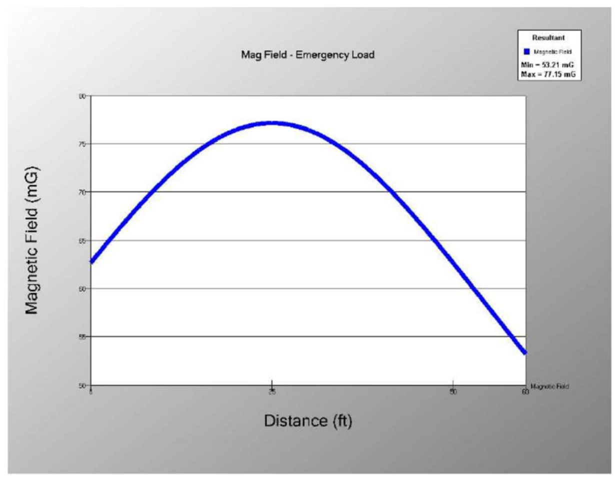

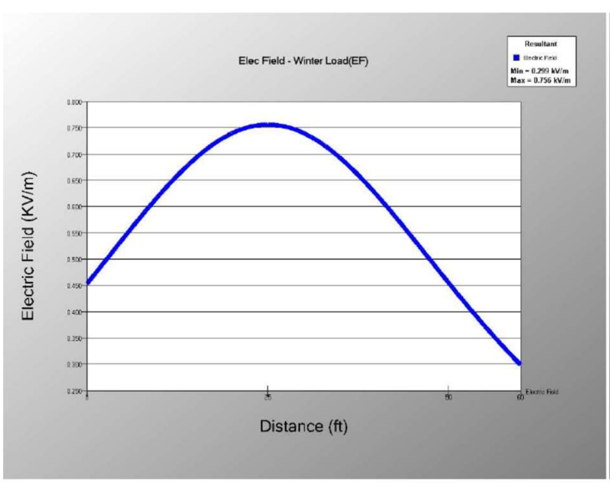

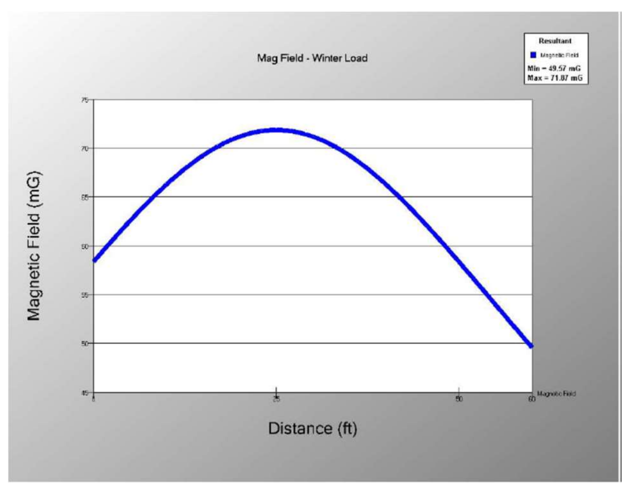

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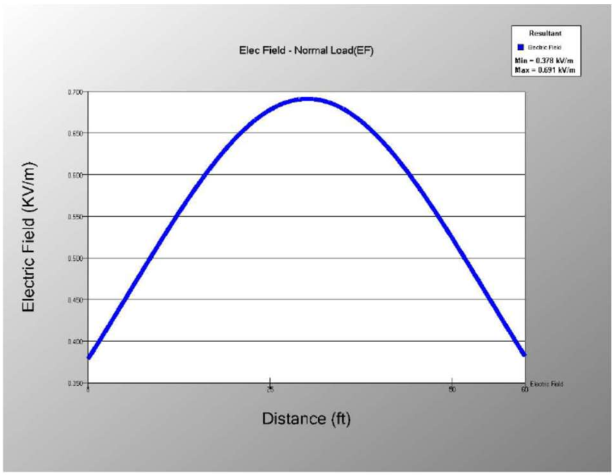
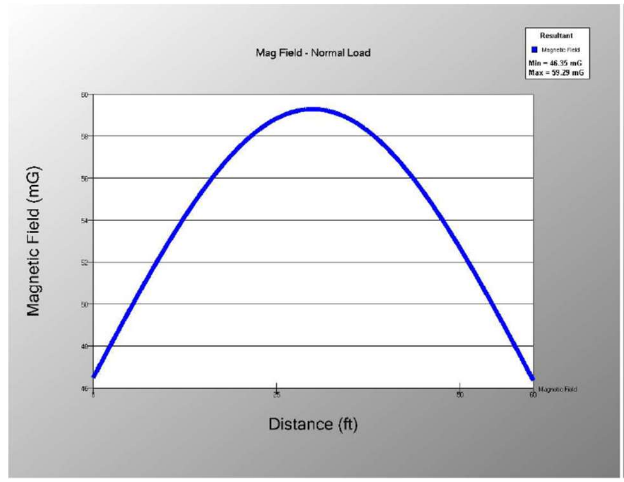
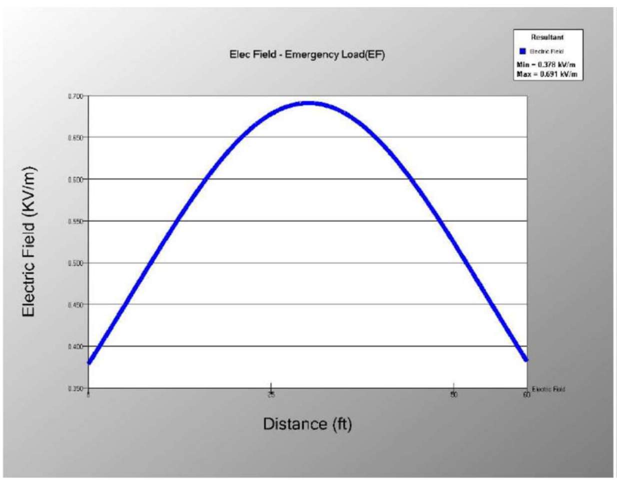
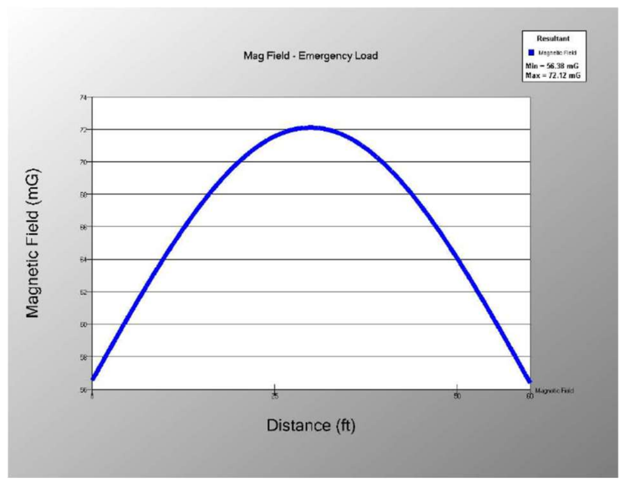
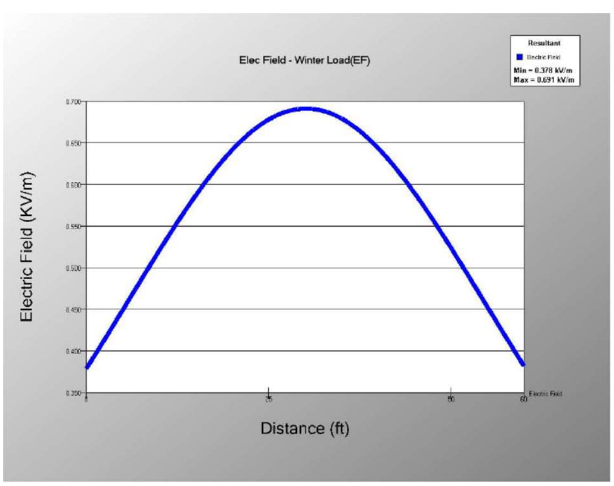










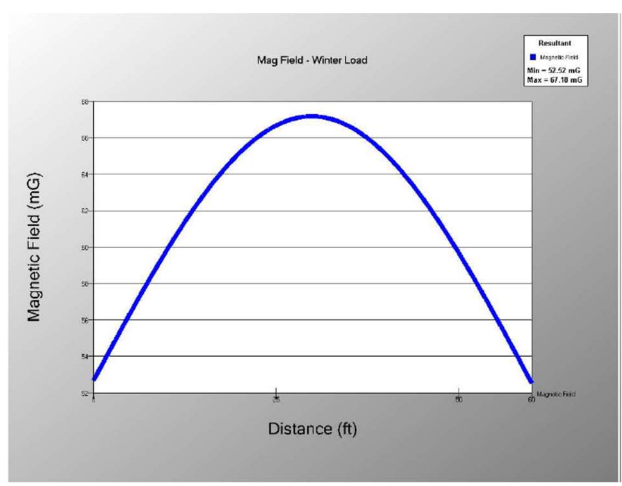
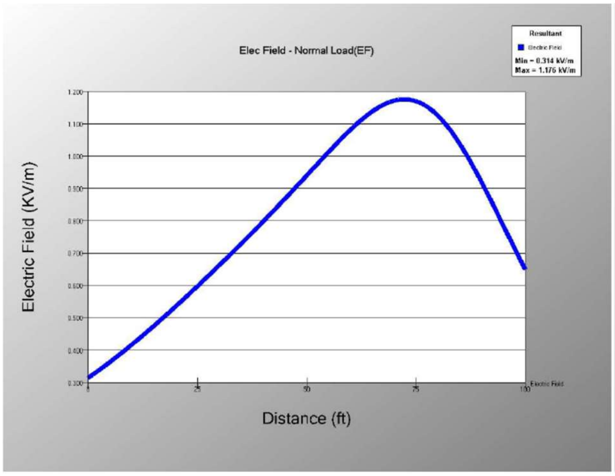
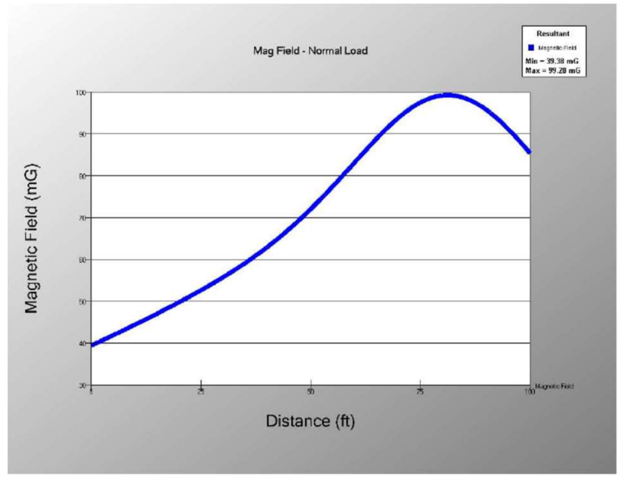
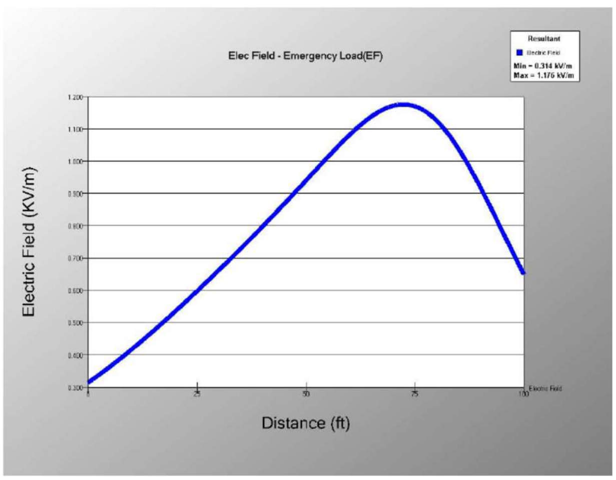
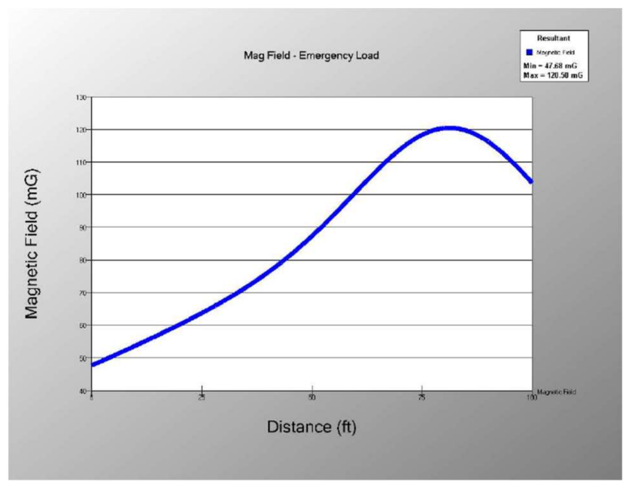


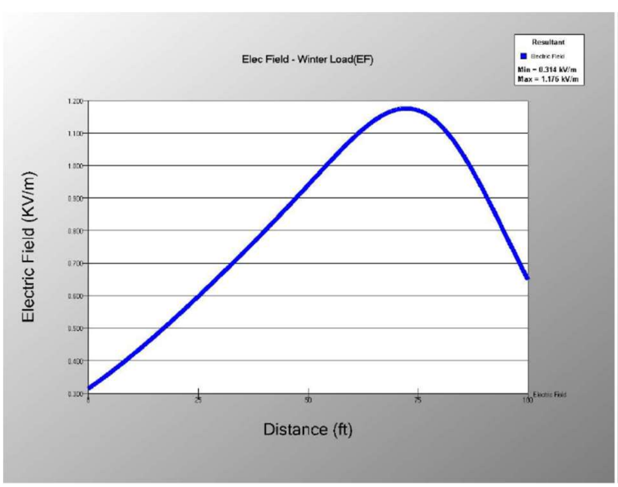
Exhibit 7-28
For Table 7-29











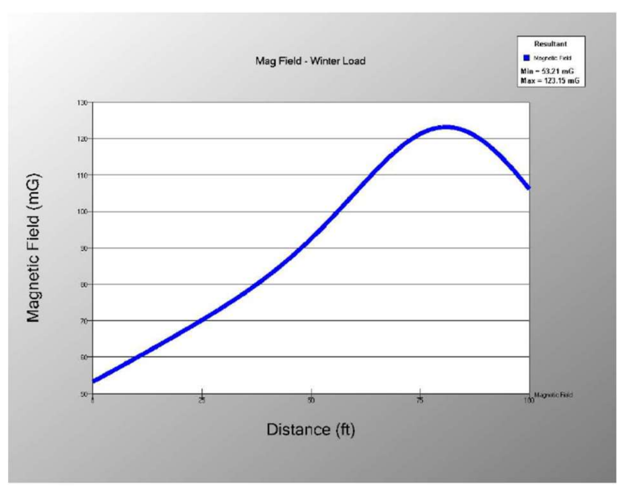
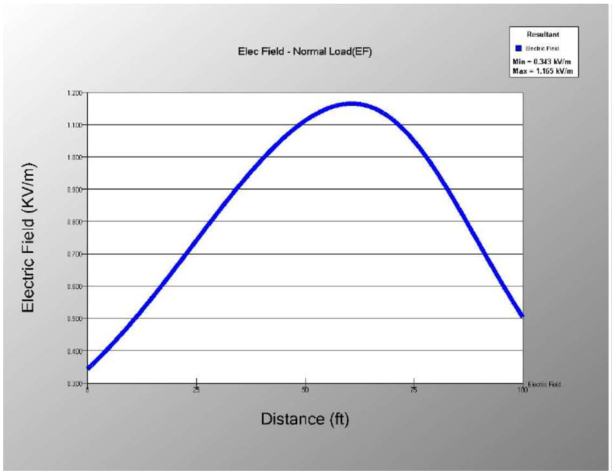
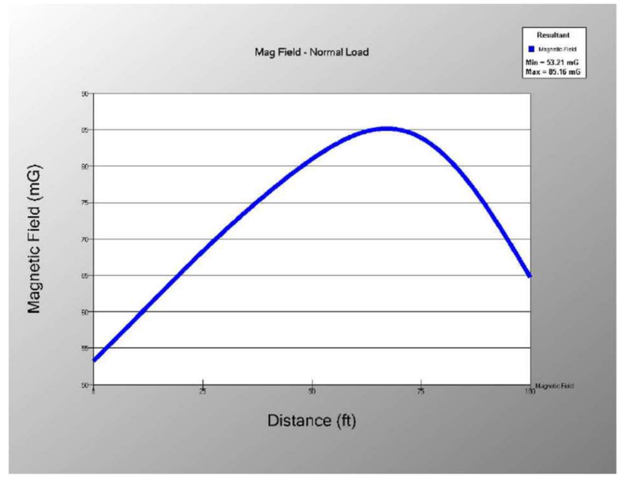
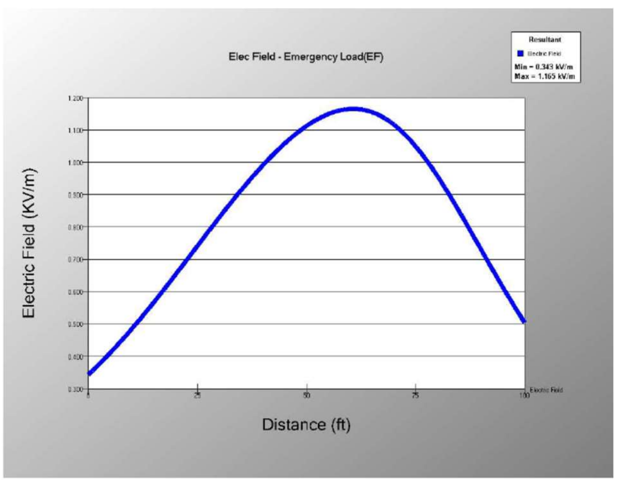
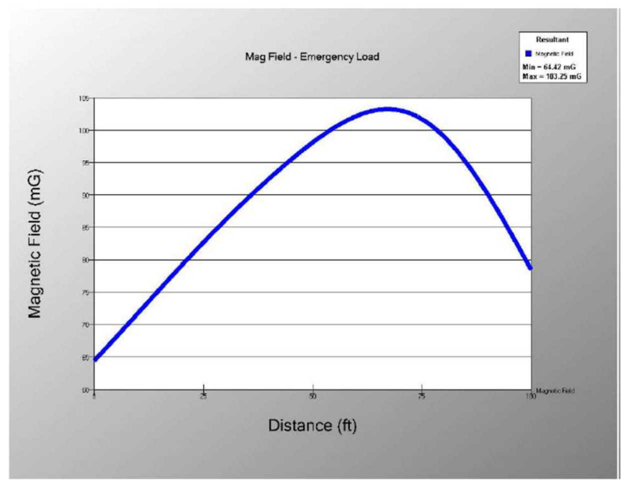


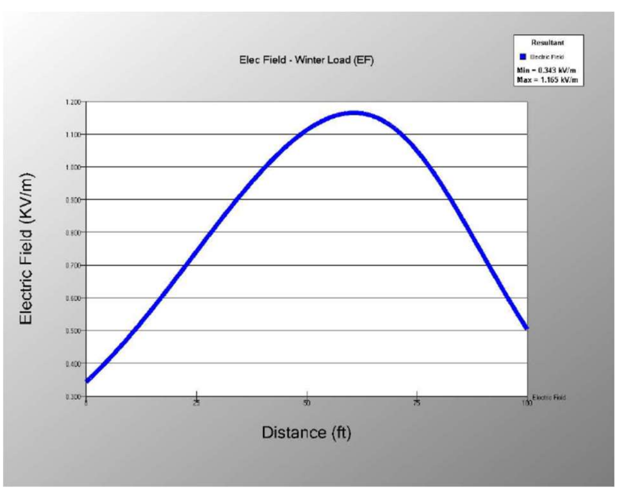
Exhibit 7-29
For Table 30











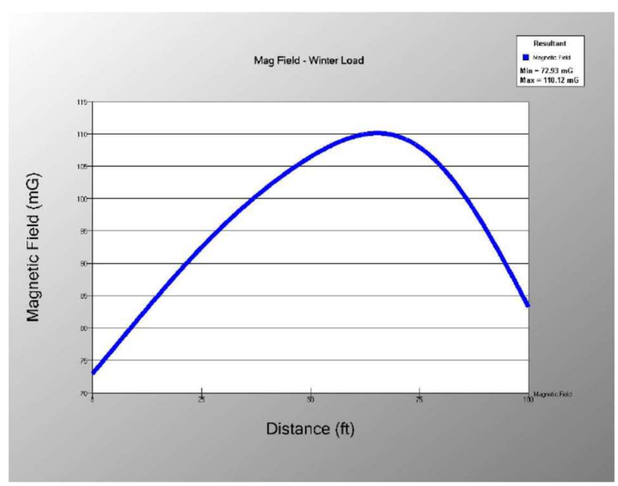
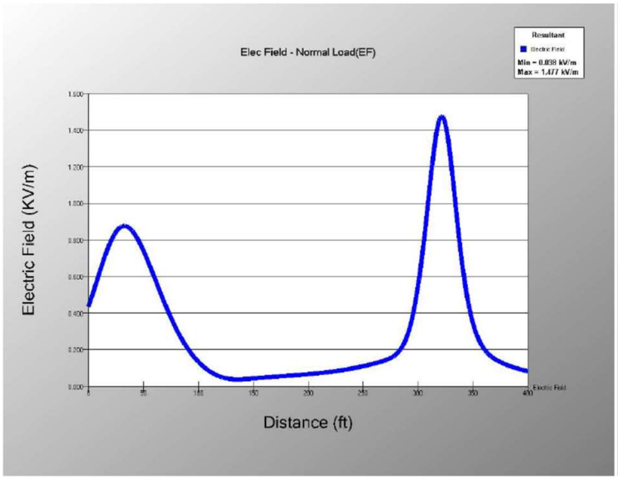
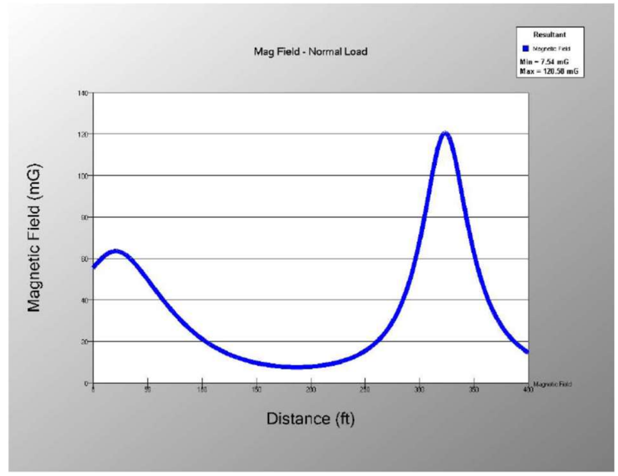
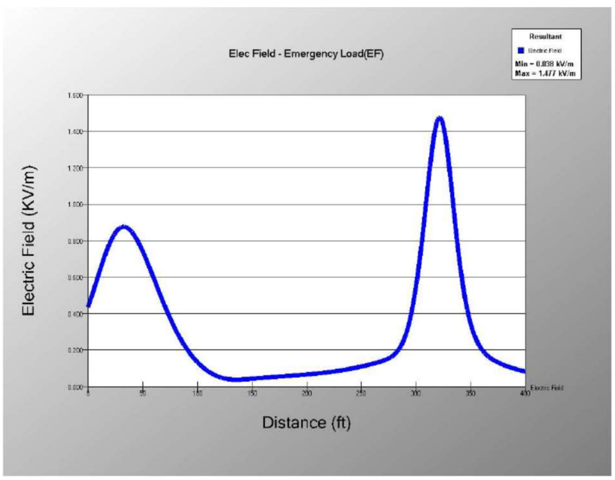
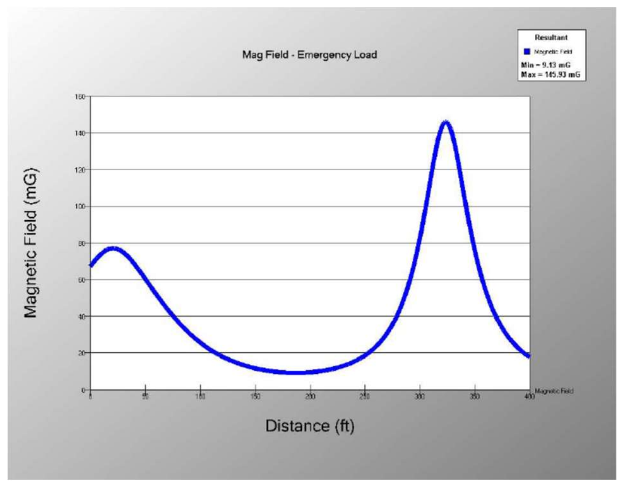


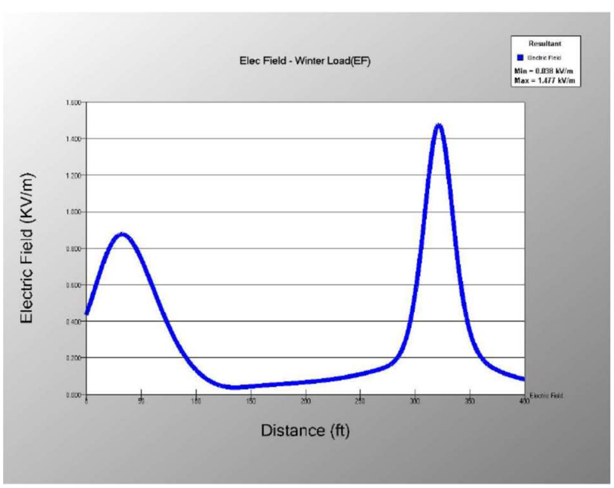
Exhibit 7-30
For Table 7-31











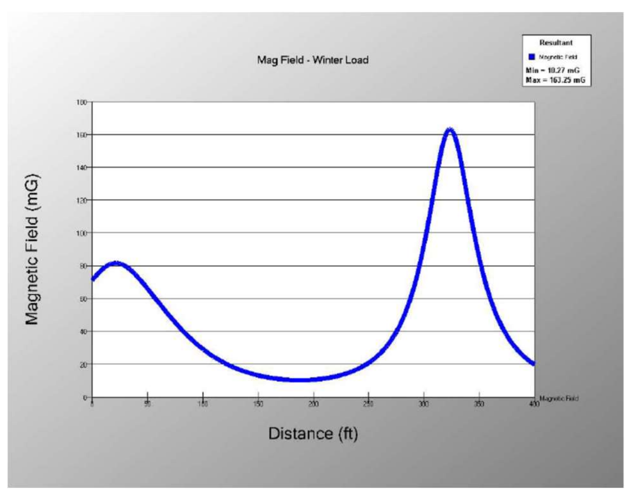


Exhibit 7-31
For Table 7-32

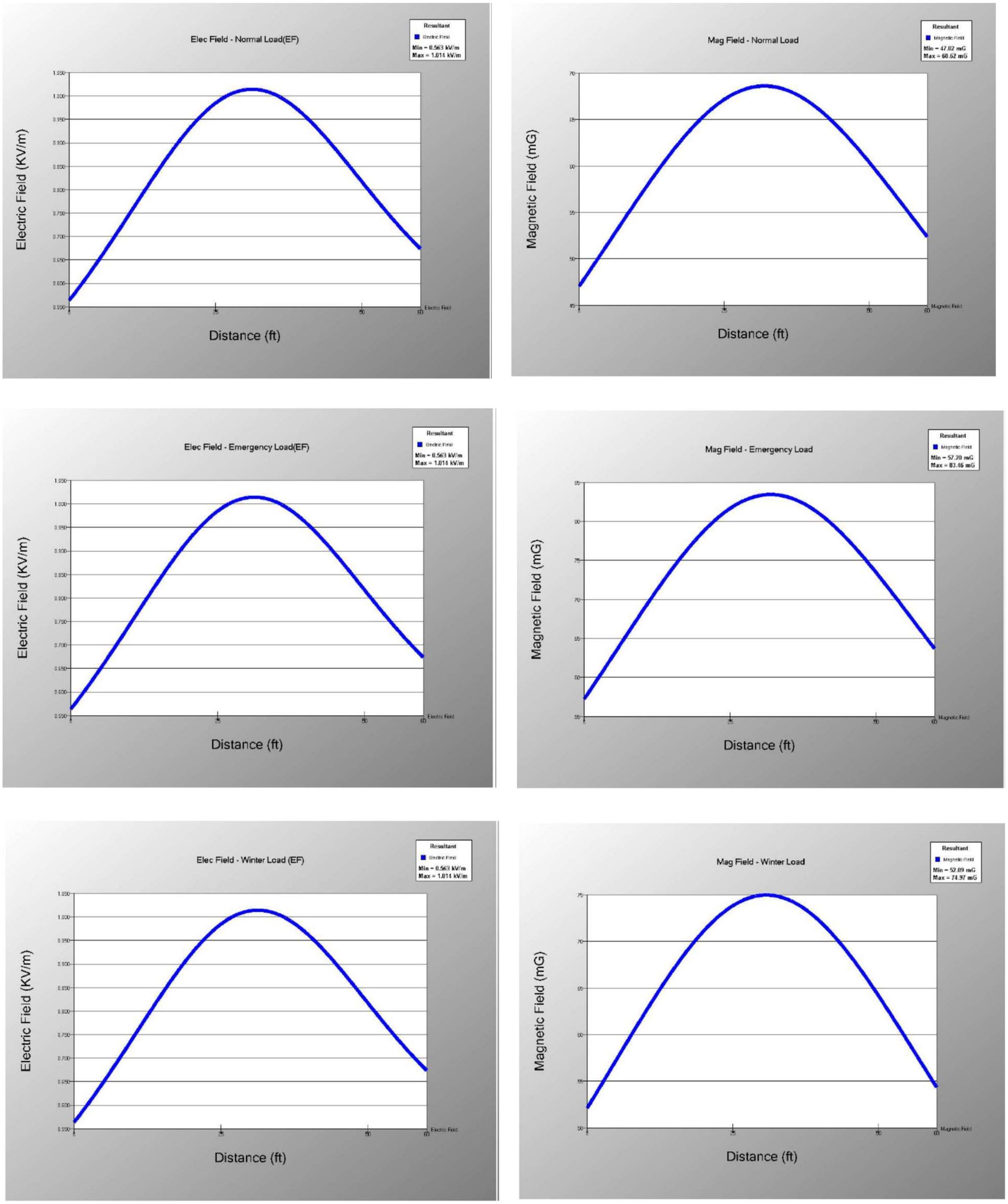


Exhibit 7-32
For Table 7-33