JUG STREET-KIRK 138 kV CIRCUIT PROJECT

AREAS OF ECOLOGICAL CONCERN, WETLAND DELINEATION, AND STREAM ASSESSMENT REPORT

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1.0 PROJECT DESCRIPTION

This document presents the results of the wetland delineation and stream assessment conducted by URS Corporation (URS) for American Electric Power (AEP) for the proposed Jug Street-Kirk 138 kV Circuit Project (Project). AEP intends to rebuild 12.2 miles of existing transmission line to accommodate a new Jug Street-Kirk 138 kV circuit through Licking County, Ohio, as shown in Figure 1.

AEP has stated the rebuilt section of transmission line will involve approximately structure for structure replacement from existing, predominantly H-frame structures to new steel poles with concrete foundations on the existing centerline. Construction will occur within existing right-of-way.

As part of the OPSB Letter of Notification (LON) requirements, AEP is required to describe the investigation concerning the presence or absence of areas of ecological concern as stated in Ohio Administrative Code (OAC) Rule 4906-15-11-01(E)(2). This rule states:

> *(E) Environmental data. Describe the environmental impacts of the proposed project. This description shall include the following information:*
>
> *(2) A description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains, wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the areas likely to be disturbed by the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.*

AEP retained URS to review areas of ecological concern, as defined above, within the proposed Project vicinity and conduct a field survey of wetlands and streams within the existing maintained right-of-way (approximately 75 feet on each side of the Project centerline or 150 feet of total width). This report will be used to assist AEP's efforts to avoid impacts to areas of ecological concern present in the study area during construction activities.

2.0 METHODS

2.1 Special Status Ecological Areas

URS reviewed desktop maps and GIS data in order to identify national and state forests and parks, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries in the Project vicinity. GIS data sources included the ODNR Biodiversity Database and federal land and parks layers available from ESRI. Property ownership within 1,000 feet of the Project was reviewed to identify parcels that may have special status. URS also noted land use during the field reconnaissance conducted from July 10 to July 12, 2012.

Floodplains were evaluated based on the Federal Emergency Management Agency's (FEMA) Flood Map Viewer (https://hazards.fema.gov/wps/portal/mapviewer).

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2.2 Wetland Delineation

The Project area was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual Version 2.0: Midwest Region* (Regional Supplement) (USACE, 2010), and the USACE *1987 Wetland Delineation Manual* (1987 Manual) (Environmental Laboratory, 1987). The Regional Supplement was released in August, 2010 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The Regional Supplement and the 1987 Manual define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

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

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

Hydrology: The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The *Regional Supplement* states that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth) is 41 degree Fahrenheit (^{o}F) or higher as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28^{o}F air temperature in the spring and fall, respectively. The National Weather Service WETS data obtained from the NRCS National Water and Climate Center for Licking County, Ohio reveals that in an average year, this period begins between April 14, and lasts until October 24, or 193 days. In the Project area, five percent of the growing season equates to approximately 9.5 days (USDA, 2012).

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The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement.* Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as, drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2010).

A review of United States Geological Survey (USGS) watershed data indicates that the Project is located within the Licking Watershed of the Muskingum River Basin Subregion and the Upper Scioto River Watershed of the Scioto River Basin Subregion (USGS, 2011). Within these watersheds, the project will cross four minor watersheds: Blacklick Creek Headwaters to near Brice, South Fork Licking River above Muddy Fork, Raccoon Creek from near Hazelton Corners to above Lobdell Creek, and South Fork Licking River below Muddy Fork to Buckeye Lake Feeder (USDA NRCS 2011).

Vegetation: Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the *1988 National List of Plant Species that Occur in Wetlands: Region 1* (Region 1 encompasses the state of Ohio). An area is determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the composition of the dominant species was FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests are used to determine if a wetland has a predominance of hydrophytic vegetation. Table 2 lists the vegetation that was identified in delineated wetlands during field surveys.

Wetland Classifications: Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). All identified wetlands within the survey corridor were classified as freshwater, Palustrine Systems, which includes all non-tidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Two Palustrine wetland classes were identified in the Project area. The two classes are defined as follows:

> ***PEM*** – Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
>
> ***PSS*** – Scrub/shrub wetlands are characterized by woody vegetation that is less than 3 inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody angiosperms (i.e. small trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

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Ohio Rapid Assessment Method v. 5.0: The Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM) was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between “Categories 1 and 2” from 30 to 34.9 and between “Categories 2 and 3” from 60 to 64.9. However, according to the Ohio EPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001). The ORAM scores for the wetlands that were delineated are discussed in Section 3.2 of this report. The three categories of wetlands defined by the individual wetland ORAM scores are defined in the following paragraphs:

Category 1 Wetlands – Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or is of low ecological functionality.

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

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

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2.3 Stream and River Crossings

Regulatory activities under the Clean Water Act provide authority for states to issue water quality standards and "designated uses" to all "Waters of the U.S." upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM).

Stream assessments were conducted using the methods described in the Ohio EPA's Methods for Assessing Habitat in Flowing Waters: Using Ohio EPA's *Qualitative Habitat Evaluation Index* (Rankin, 2006) and *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, version 3* (Davic, 2012).

Ohio EPA Qualitative Habitat Evaluation Index: The qualitative habitat evaluation index (QHEI) is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and which are generally important to other aquatic life (*e.g.,* macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive qualitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey general stream habitat quality to the regulated public, the Ohio EPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 square miles) versus larger streams (L are those with a watershed area greater than 20 square miles). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L). Results of the QHEI assessments are discussed in Section 3.3 of this report.

Ohio EPA Primary Headwater Habitat Evaluation Index: Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment method for physical habitat that

can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a "defined bed and bank, with either continuous or periodically flowing water, with watershed area less than or equal to 1.0 mi^2 (259 ha), *and* a maximum depth of water pools equal to or less than 15.75 inches (40 cm)" (Davic, 2012).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class 1 PHWH Streams", 30 to 69.9 are "Class 2 PHWH Streams", and 70 to 100 are "Class 3 PHWH Streams". Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the Ohio EPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (Davic, 2012). Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream. Results of HHEI assessed streams are discussed in Section 3.3 of this report.

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

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

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

3.0 RESULTS

3.1 Special Status Ecological Areas

Based on published resources, no national or state forests and parks, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, wildlife sanctuaries or floodplains were identified within 1,000 feet of the rebuild sections of the Project. No impacts to these special status ecological areas are anticipated.

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3.2 Wetland Delineation

A total of 15 wetlands (3.31 acres) were identified within the Project Jug Street-Kirk survey corridor. URS considers all 15 wetlands to be jurisdictional (i.e., "Waters of the U.S."). The 15 wetlands were of three wetland habitat types: palustrine emergent (PEM), palustrine emergent/scrub-shrub (PEM/PSS), and palustrine scrub-shrub/emergent (PSS/PEM). Wetlands identified within the Jug Street-Kirk survey corridor are summarized in Table 1. Based on ORAM v. 5.0 methodology, 10 of the 15 wetlands within the Jug Street-Kirk survey corridor are Category 1 wetlands, and the remaining five wetlands are Category 2 wetlands. No Category 3 wetlands were identified in the Project survey corridor. Wetland 7 had the lowest ORAM score, 17, and Wetland 9 had the highest score, 38.

Category 1 Wetlands – The 10 Category 1 wetlands delineated within the Jug Street-Kirk survey corridor were identified as three PEM wetlands, four PEM/PSS wetlands, and three PSS/PEM wetlands. The highest scoring Category 1 wetland was 29 (Wetland 2 and 14), and the lowest was 17 (Wetland 11). These wetlands typically exhibited narrow upland buffers and intensive use of surrounding upland areas (row cropping, open pasture, residential, or existing rights-of-way), exhibited limited plant community development with a high percentage of invasive species, and characteristically had recovered or were recovering from modification to substrate and habitat.

Category 2 Wetlands – The five Category 2 wetlands delineated within the Jug Street-Kirk survey corridor were identified as four PEM wetlands and one PSS/PEM wetland. The highest scoring Category 2 wetland was 38 (Wetland 9), and the lowest was 30 (Wetland 3). These wetlands exhibited a fair to moderately-good quality plant community with a nearly absent to moderately high percentage of invasive species, high to moderately low intensity surrounding land use, and had recovered or were recovering from modification to substrate and habitat.

Category 3 Wetlands – No Category 3 wetlands were identified in the Project survey corridor.

The locations and approximate extents of the wetlands identified within the Jug Street-Kirk survey corridor are shown on Figures 2A through 2I. Completed USACE wetland delineation and ORAM forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix C. Table 2 lists the vegetation that was identified in delineated wetlands during field surveys.

TABLE 1
DELINEATED WETLANDS WITHIN THE JUG STREET-KIRK 138 kV CIRCUIT 150-FOOT SURVEY CORRIDOR

Report Name	Cowardin Wetland Type[a]	Wetland Description	ORAM Score	ORAM Category	Acreage within 150-Foot Corridor	Approximate Length Crossed by Proposed Centerline (feet)
Wetland 01	PEM	Emergent wetland in existing transmission line right-of way that acts as a drainage conveyance	33	2	0.23	153
Wetland 02	PEM	Emergent wetland in existing transmission line right-of way that abuts Stream 2.	29	1	0.09	80
Wetland 03	PEM	Emergent wetland in existing transmission line right-of way that abuts Stream 2.	30	2	0.06	NC
Wetland 04	PEM/PSS	Emergent/Scrub-Shrub wetland in existing transmission line right-of-way and within agricultural field.	27.5	1	0.27	103
Wetland 05	PSS/PEM	Scrub-Shrub/Emergent wetland dominated by black willow and reed canary grass.	36	2	0.90	292
Wetland 06	PEM/PSS	Emergent/Scrub-Shrub wetland dominated by reed canary grass and black willow. Stream 8 flows through the wetland.	26	1	0.54	283
Wetland 07	PEM	Emergent wetland in existing transmission line right-of way that is dominated by reed canary grass.	17	1	0.25	89
Wetland 08	PEM	Emergent wetland in existing transmission line right-of way that is located abutting Stream 10	36	2	0.03	NC
Wetland 09	PEM	Emergent wetland in existing transmission line right-of way that is dominated by sweet flag. Stream 11 also flows through the wetland.	38	2	0.25	83
Wetland 10	PSS/PEM	Scrub-Shrub/Emergent wetland located within existing right-of-way and near residential houses.	26	1	0.15	NC
Wetland 11	PEM/PSS	Emergent/Scrub-Shrub wetland in existing transmission line right-of-way and is impacted by lift station/septic system	17	1	0.17	NC
Wetland 12	PSS/PEM	Scrub-Shrub/Emergent wetland dominated by reed canary grass, narrow leaf cattail, cottonwood, and black willow.	22	1	0.25	84
Wetland 13	PEM	Emergent wetland in existing transmission line right-of way that is dominated by reed canary grass.	20	1	0.02	NC
Wetland 14	PEM/PSS	Emergent/Scrub-Shrub wetland in existing right-of-way that is dominated by reed canary grass and narrow leaf cattail.	29	1	0.10	17
Wetland 15	PSS/PEM	Scrub-Shrub/Emergent wetland dominated by black willow and reed canary grass.	27	1	0.12	28
Total: 15 Wetlands					**3.31**	**1,213**

Wetlands listed from West to East
[a] PEM – palustrine emergent; PSS – palustrine scrub/shrub

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TABLE 2
VEGETATION IDENTIFIED WITHIN DELINEATED WETLANDS

Common Name	Scientific Name	Stratum[a]	Midwest Region Indicator Status[b]
American Wild Mint	*Mentha arvensis*	H	FACW
Arrow-Leaf Tearthumb	*Persicaria sagittata*	H	OBL
Black Willow	*Salix nigra*	S	OBL
Blount Broom Sedge	*Carex tribuloides*	H	OBL
Broad-Leaf Cat-Tail	*Typha latifolia*	H	OBL
Common Boneset	*Eupatorium perfoliatum*	H	OBL
Common Fox Sedge	*Carex vulpinoidea*	H	FACW
Cottongrass Bulrush	*Scirpus cyperinus*	H	OBL
Creeping-Jenny	*Lysimachia nummularia*	H	FACW
Dark-Green Bulrush	*Scirpus atrovirens*	H	OBL
Deer-Tongue Rosette Grass	*Dichanthelium clandestinum*	H	FACW
Eastern Cottonwood	*Populus deltoides*	S	FAC
Eastern Poison-Ivy	*Toxicodendron radicans*	H	FAC
Giant Ironweed	*Vernonia gigantea*	H	FAC
Grape	*Vitis* sp.	V	FAC
Greater Bladder Sedge	*Carex intumescens*	H	FACW
Green Ash	*Fraxinus pennsylvanica*	S	FACW
Indian-Hemp	*Apocynum cannabinum*	H	FAC
Iris	*Iris* sp.	H	OBL
Lady's-Thumb	*Persicaria maculosa*	H	FACW
Lamp Rush	*Juncus effusus*	H	OBL
Lesser Poverty Rush	*Juncus tenuis*	H	FAC
Narrow-Leaf Cat-Tail	*Typha angustifolia*	H	OBL
Needle Spike-Rush	*Eleocharis acicularis*	H	OBL
Pin Oak	*Quercus palustris*	S	FACW
Pinkweed	*Persicaria pensylvanica*	H	FACW
Purple-Leaf Willowherb	*Epilobium coloratum*	H	OBL
Rambler Rose	*Rosa multiflora*	S	FACU
Red Maple	*Acer rubrum*	S	FAC
Reed Canary Grass	*Phalaris arundinacea*	H	FACW
Rice Cut Grass	*Leersia oryzoides*	H	OBL
Sallow Sedge	*Carex lurida*	H	OBL
Sensitive Fern	*Onoclea sensibilis*	H	FACW
Simpler's-Joy	*Verbena hastata*	H	FACW
Soft-Stem Club-Rush	*Schoenoplectus tabernaemontani*	H	OBL
Spotted Touch-Me-Not	*Impatiens capensis*	H	FACW
Short-Beak Arrowhead	*Sagittaria brevirostra*	H	OBL

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TABLE 2
VEGETATION IDENTIFIED WITHIN DELINEATED WETLANDS

Common Name	Scientific Name	Stratum[a]	Midwest Region Indicator Status[b]
Squarrose Sedge	*Carex squarrosa*	H	OBL
Swamp Milkweed	*Asclepias incarnata*	H	OBL
Swamp Rose	*Rosa palustris*	S	OBL
White Grass	*Leersia virginica*	H	FACW

[a] H = herb, S = shrub or sapling, T = tree, V = vine

Preliminary Soils Evaluation: According to the *Web Soil Surveys* for Licking County, Ohio (USDA, 2012) and the Natural Resources Conservation Services Hydric Soils List of Ohio, 13 soil map units from seven soil series are mapped within the 150-foot survey corridor, and include six soil series with hydric soil map units (USDA, 2011). Soils in each wetland were observed and documented as part of the delineation methodology. Soil series located within the Project area are shown on Figures 2A through 2I. Thirteen soil map units from seven soil series are mapped within the limits of the Project survey boundary (USDA 2011). Table 3 provides a list of these soil map units along with their basic attributes.

TABLE 3
SOIL MAP UNITS AND DESCRIPTIONS

Soil Series	Symbol	Map Unit Description	Percent of Survey Corridor by Series	Topographic Setting	Hydric	Hydric Component (%)
Amanda	AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded	0.56	Low knolls and ridges on till plains	no	n/a
	AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded	0.39	Knolls, ridges and dissected side slopes on till plains	no	n/a
	AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded	1.58	Dissected side slopes along drainageways and knolls	no	n/a
Bennington	BeA	Bennington silt loam, 0 to 2 percent slopes	12.17	Depressions	Inclusions	Pewamo (10)
	BeB	Bennington silt loam, 2 to 6 percent slopes	22.19	Depressions, till plains, ground moraines	Inclusions	Pewamo (10)
	BfA	Bennington-Urban land complex, 0 to 3 percent slopes	1.76	Depressions	Inclusions	Pewamo (10)
Celina	CeB	Celina silt loam, 2 to 6 percent slopes	30.15	Depressions	Inclusions	Pewamo (10)
Centerburg	CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded	8.11	Depressions	Inclusions	Pewamo (5)
	CfB	Centerburg silt loam, 2 to 6 percent slopes	3.47	Depressions	Inclusions	Pewamo (10)
	CfC	Centerburg-Urban land complex, 6 to 12 percent slopes	1.57	Depressions	Inclusions	Pewamo (10)
Pewamo	Pe	Pewamo silty clay loam	14.91	Till plains, flats	yes	Pewamo (100)

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TABLE 3
SOIL MAP UNITS AND DESCRIPTIONS

Soil Series	Symbol	Map Unit Description	Percent of Survey Corridor by Series	Topographic Setting	Hydric	Hydric Component (%)
Shoals	Sh	Shoals silt loam, occasionally flooded	1.80	Flood plains	Inclusions	Sloan (5)
Sloan	So	Sloan silt loam, frequently flooded	1.31	Channels, flood plains	yes	Sloan (100)

NOTES:

(1) Percentages do not add up to exactly 100% due to rounding

(2) Data sources include:

USDA, NRCS. 2011 Soil Survey Geographic (SSURGO) Database. Available online at: http://soildatamart.nrcs.usda.gov/

USDA, NRCS. February 2011. National Hydric Soils List by State. Available online at: ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/hydric_soils.xlsx

USDA, NRCS. 1986. Soil Survey of Licking County, Ohio.

National Wetland Inventory Map Review: National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI maps of the Pataskala, Jersey, and New Albany Ohio quadrangles, the survey corridor contained seven mapped NWI wetlands, including one Palustrine Freshwater Emergent wetland, four Palustrine Forested/Shrub wetlands, and two freshwater ponds. A portion of the mapped NWI Palustrine Freshwater Emergent wetland was crossed by Wetland 7 along the Project survey corridor. Portions of two mapped freshwater ponds (PUBGh and PUBGx) were also identified as Pond 1 and Pond 2. Summary information on NWI mapped wetlands is presented in Table 4.

TABLE 4
NWI WETLANDS WITHIN THE 150-FOOT SURVEY CORRIDOR

Wetland Type	NWI Code	NWI Habitat Type [1]	Total Number of Each Habitat Type	NWI Quadrangle(s)
Freshwater Emergent Wetland	PEM1C	Palustrine Emergent Persistent Seasonally Flooded	1	Jersey
Freshwater Forested/Shrub Wetland	PFO1A	Palustrine Forested Broad-Leaved Deciduous Temporarily Flooded	3	Jersey
Freshwater Forested/Shrub Wetland	PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded	1	Jersey
Freshwater Pond	PUBGh	Palustrine Unconsolidated Bottom Intermittently Exposed Diked / Impounded	1	Jersey
Freshwater Pond	PUBGx	Palustrine Unconsolidated Bottom Intermittently Exposed Excavated	1	Pataskala
Total # NWI Wetlands = 7				
Total # PEM = 1				
Total # PFO = 4				
Total # PUB = 2				
[1] USFWS National Wetlands Inventory Classification De-coder: http://137.227.242.85/Data/interpreters/wetlands.aspx				

3.3 Stream and River Crossings

Streams within the 150-foot survey corridor are provided in Table 5. The locations of streams identified within the 150-foot survey corridor are shown on Figures 2A through 2I. Within the 150-foot survey corridor, 15 streams, totaling 3,414 linear feet were assessed: seven ephemeral, seven intermittent, and one perennial waterbodies. Fourteen streams were assessed using the HHEI methodology (drainage area less than 1 mi^2). The remaining stream was assessed using the QHEI methodology (drainage area greater than 1 mi^2). Based on USGS topographic quadrangle maps, none of these streams appear to be named. URS has preliminarily determined the 15 streams appear to be jurisdictional (i.e., "Waters of the U.S.").

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TABLE 5
STREAMS IDENTIFIED WITHIN THE
JUG STREET-KIRK 150-FOOT SURVEY CORRIDOR

Name	Flow Type	Width of Stream Crossing (feet)	Maximum Pool Depth (inches)	Length within Survey Corridor (feet)	Assessment Used	Score	Narrative Description
Stream 01	Intermittent	4	2	162	HHEI	27	Modified Class 1
Stream 02	Ephemeral	4	0	290	HHEI	20	Modified Class 1
Stream 03	Ephemeral	1.5	0	235	HHEI	11	Modified Class 1
Stream 04	Perennial	14	6	203	QHEI	56	Good WWH
Stream 05	Intermittent	4	4	152	HHEI	66	Modified Class 2
Stream 06	Ephemeral	1	0	155	HHEI	8	Modified Class 1
Stream 07	Intermittent	6	0	308	HHEI	39	Modified Class 2
Stream 08	Intermittent	2	0	229	HHEI	8	Modified Class 1
Stream 09	Ephemeral	0.5	0	233	HHEI	8	Modified Class 1
Stream 10	Intermittent	4	2	262	HHEI	34	Modified Class 2
Stream 11	Ephemeral	1	0	185	HHEI	6	Modified Class 1
Stream 12	Ephemeral	1	0	125	HHEI	10	Modified Class 1
Stream 13	Intermittent	2	3	248	HHEI	27.5	Modified Class 1
Stream 14	Ephemeral	2	0	154	HHEI	6	Modified Class 1
Stream 15	Intermittent	4	0	473	HHEI	21	Modified Class 1
Totals: 15 Streams		**51**		**3,414**			

Note: WWH = Warmwater Habitat;
Streams listed from east to west

Qualitative Habitat Evaluation Index: The one QHEI assessed stream crossing within the 150-foot survey corridor (Stream 4) had a narrative rating of good warmwater habitat. As provided in Table 5, this stream received a score of 56, with 203 linear feet calculated within the survey corridor. A QHEI form for this stream is provided in Appendix B. A color photograph taken during the field survey is provided in Appendix C.

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Primary Headwater Habitat Evaluation Index: Field surveys along the ecology survey corridor identified 14 primary headwater streams: 11 Modified Class 1 stream and three Modified Class 2 streams. No Class 3 headwater streams were identified. Completed HHEI forms are provided in Appendix B. Color photographs were taken of each stream during the field survey and are provided in Appendix C.

Modified Class 1 Headwater Streams - Eleven Modified Class 1 headwater streams totaling 2,692 linear feet within the survey corridor were identified during the field investigation. Seven of the streams were ephemeral, with the remaining four intermittent. Scores ranged from 6 to 27.5. The dominant substrates consisted of clay and hardpan, with lesser amounts of fine detritus and silt. The streams contained evidence of stream channel modification (channelization, culverting, etc.), which resulted in the streams receiving a Modified Class 1 designation. Most of the streams were dry at the time of the field survey.

Modified Class 2 Headwater Streams – Three Modified Class 2 headwater streams totaling 722 linear feet were identified during the field investigation, with scores ranging between 34 and 66. The three streams were intermittent, and the dominant substrates were silt, gravel, cobble, clay, and hardpan, with lesser amounts of muck, leaf pack/woody debris, and artificial substrates. The streams contained evidence of stream channel modifications (e.g. channelization, culverting, etc.). These modifications result in these streams receiving a Modified Class 2 designation.

4.0 SUMMARY

No national or state forests and parks, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, wildlife sanctuaries or floodplains were identified within 1,000 feet of the Project.

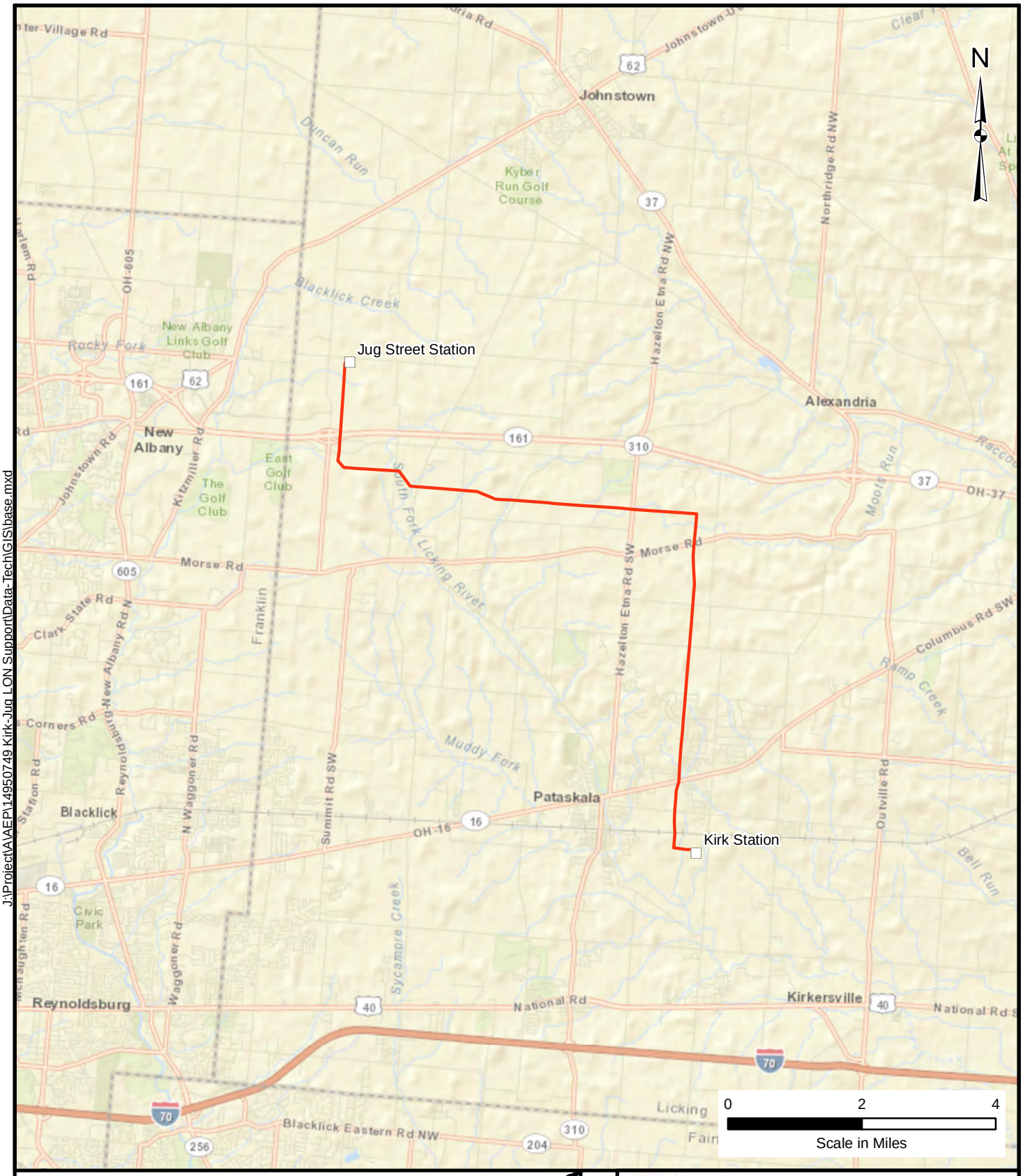
During the field survey, a total of 15 wetlands were identified within the 150-foot survey corridor. The 15 wetlands totaled 3.25 acres within the survey area. Wetland habitat type for these wetlands included palustrine emergent (PEM) and palustrine scrub/shrub (PSS). Ten of the wetlands were classified as Category 1, and the remaining five wetlands were classified as a Category 2.

Within the 150-foot survey corridor, 15 streams, totaling 3,414 linear feet, were assessed: seven ephemeral, seven intermittent, and one perennial. Fourteen streams were assessed using the HHEI methodology (drainage area less than 1 mi^2) and one stream was assessed using the QHEI methodology (drainage area greater than 1 mi^2). The HHEI streams ranged in score between 6 and 66, and the QHEI stream received a score of 56.

5.0 CONCLUSION

This report will be used to assist AEP's efforts to avoid wetlands and streams to the extent possible during the installation of replacement structures and use of construction access routes, thereby minimizing impacts to any wetlands and streams identified along the length of the rebuilt centerline.

While pole placement and access roads have not been fully engineered to date, it is expected that most wetlands and streams can be spanned due to their locations, size, and infrequency of occurrence. No current structures are located within boundaries of delineated wetlands. No replacement structures for the Project are expected to be placed within wetlands. Surficial impacts to wetlands, if any, will likely result from vehicular impacts during re-conductoring operations. Erosion control methods including silt fencing are expected to be used where appropriate to minimize runoff related impacts to wetlands and stream channels. As a consequence, significant impacts to these “Waters of the U.S.” are not anticipated. Notification or permit applications under Sections 401 and/or 404 of the Clean Water Act are not expected to be required by either the Ohio EPA or the USACE for this project.



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LEGEND:

Proposed Jug Street-Kirk 138 kV Circuit

Overview Map

BASE MAP SOURCE:
ArcGIS Map Service, World_Street_Map
http://services.arcgisonline.com/arcgis/services

AEP

Jug Street-Kirk
138 kV Circuit

FIGURE 1
PROJECT OVERVIEW

JOB NO. 14950749

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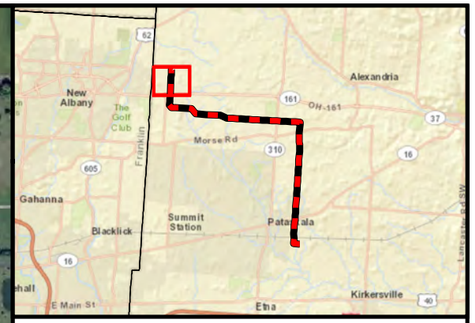

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2A
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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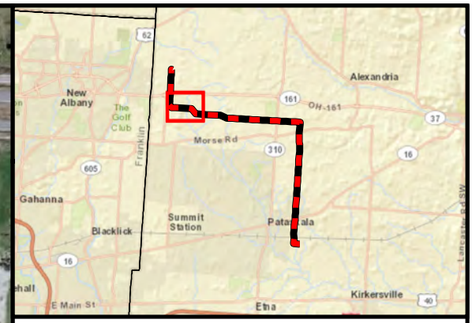

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2B
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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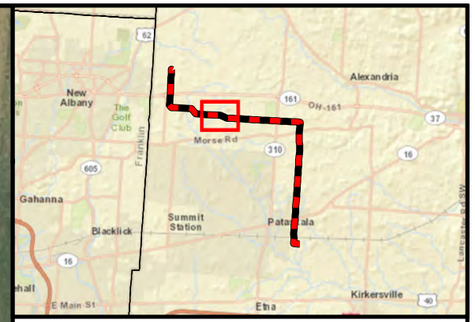

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2C
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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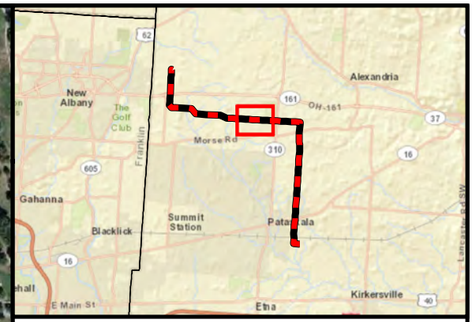

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2D
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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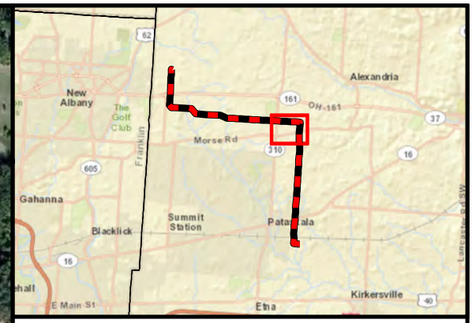

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2E
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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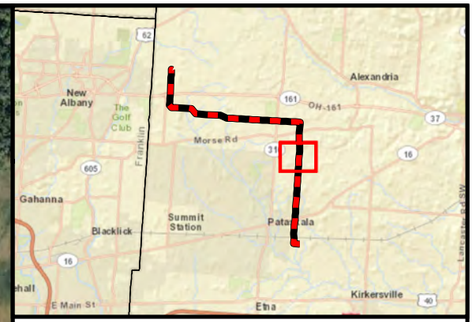

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
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BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
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CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2F
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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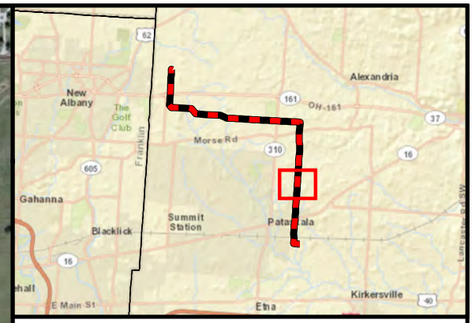

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2G
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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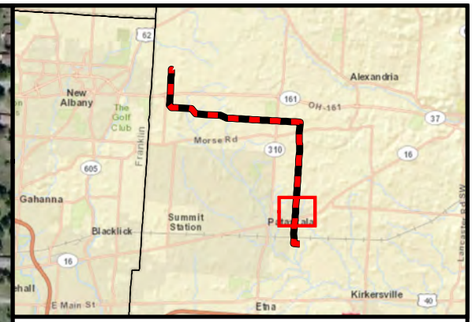

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
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BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2H
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

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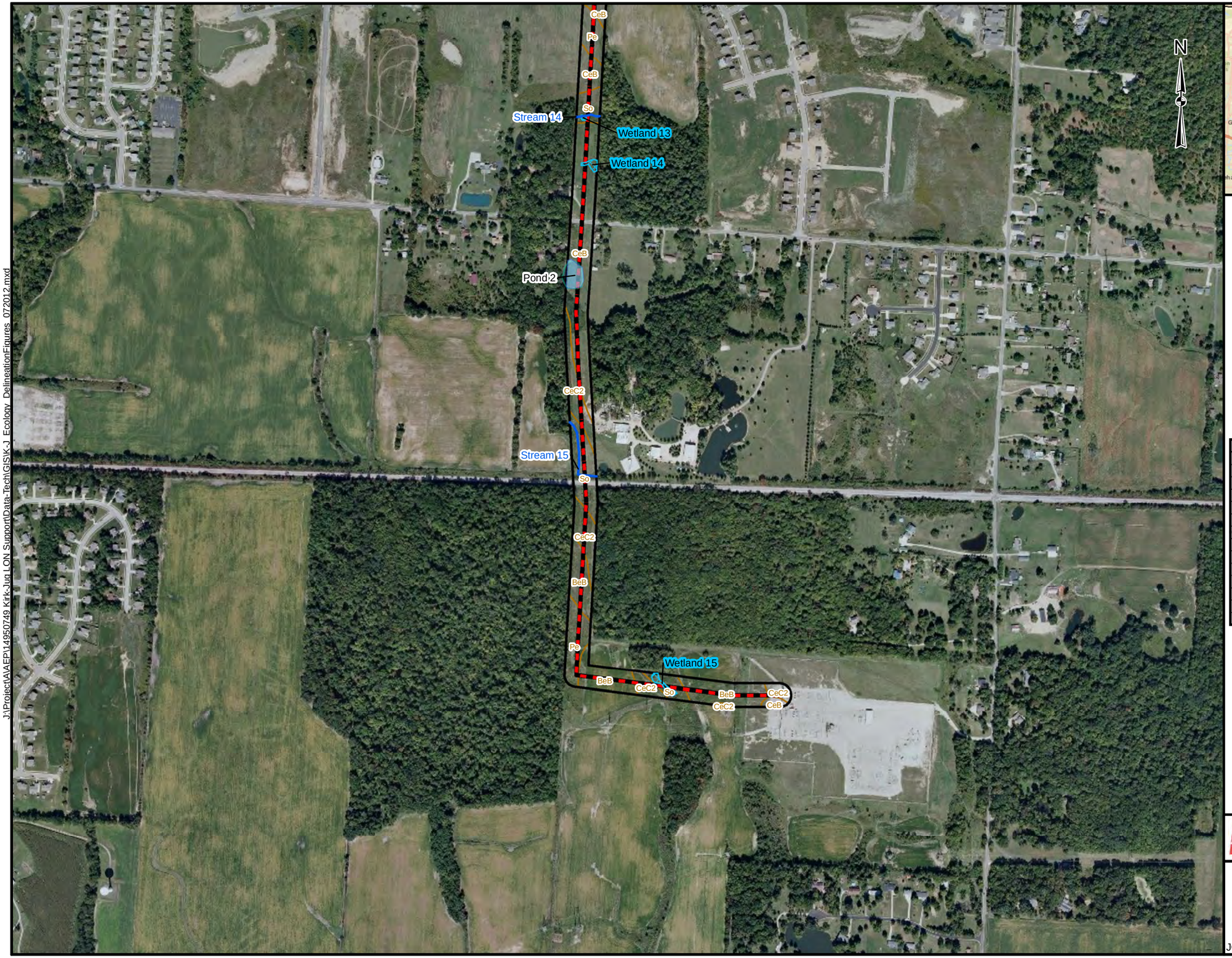

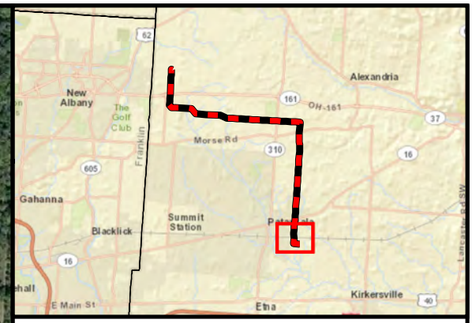

Figure Key

LEGEND:

- Route
- 150ft Ecological Survey Corridor
- Delineated Wetland
- Delineated Pond
- Delineated Stream
- National Wetland Inventory Area
- Soils within the 150ft Ecological Corridor

Symbol	Map Unit Description
AmB2	Amanda silt loam, 2 to 6 percent slopes, eroded
AmC2	Amanda silt loam, 6 to 12 percent slopes, eroded
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded
BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 6 percent slopes
BfA	Bennington-Urban land complex, 0 to 3 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded
CfB	Centerburg-Urban land complex, 2 to 6 percent slopes
CfC	Centerburg-Urban land complex, 6 to 12 percent slopes
Pe	Pewamo silty clay loam
Sh	Shoals silt loam, occasionally flooded
So	Sloan silt loam, frequently flooded
W	Water

0 600 1,200

Scale in Feet

BASE MAP SOURCE:
Aerials Express, Columbus 2009.

Jug Street to Kirk
138 kV Circuit

FIGURE 2I
ECOLOGICAL SURVEY RESULTS

JOB NO. 14950749

Summary: Letter of Notification and Attachments for Kirk-Jug 138 kV Circuit Project (Part 6 of 12) electronically filed by Erin C Miller on behalf of AEP Ohio Transmission Company, Inc.