328.3(a)(1) through (a)(8)]. For example, the document states "Waters located within the 100-year floodplain of a traditional navigable water, interstate water, or the territorial seas and waters located more than 1,500 feet and less than 4,000 feet from the lateral limit of an (a)(1) or (a)(3) water may still be determined to have a significant nexus on a case-specific basis under paragraph (a)(8) of the rule and, thus, be a "water of the United States" (EPA 2015).

On June 29, 2015 the new Clean Water Rule was entered into the Federal Register (40 CFR Parts 110, 112, 116, et al. Clean Water Rule: Definition of ''waters of the United States''; Final Rule). This report will refer to this rule as "June 29, 2015 WOTUS Rule". This rule includes exact distances mentioned in the May 27, 2015 Technical Support Document as it relates to adjacent waters, including the following:

- Waters within 100 ft. of jurisdictional waters;
- Waters within the 100-year floodplain to a maximum of 1,500 feet from the ordinary high water mark (OHWM);
- Waters within the 100-year floodplain with a SNE to the Traditional Navigable Water (TNW); and
- Waters with a SNE within 4,000 ft. of jurisdictional waters.

On October 9, 2015 the U.S. Court of Appeals for the Sixth Circuit (Court) issued a nationwide stay against the enforcement of the June 29, 2015 WOTUS Rule. The Court stated, "…we conclude that…Justice Kennedy's opinion in *Rapanos* represents the best instruction on the permissible parameters of "waters of the United States" as used in the Clean Water Act, it is far from clear that the new Rule's distance limitations are harmonious with the instruction.

Moreover, the Court stated that the rulemaking process by which the distance limitations were adopted is facially suspect. Petitioners contend the proposed rule that was published, on which interested persons were invited to comment, did not include any proposed distance limitations in its use of terms like "adjacent waters" and "significant nexus." Consequently, petitioners contend, the Final Rule cannot be considered a "logical outgrowth" of the rule proposed, as required to satisfy the notice-and-comment requirements of the APA, 5 U.S.C. Section 553. As a further consequence of this defect, petitioners contend, the record compiled by respondents is devoid of specific scientific support for the distance limitations that were included in the Final Rule. They contend the Rule is therefore not the product of reasoned decision-making and is vulnerable to attack as impermissibly "arbitrary or capricious" under the APA, 5 U.S.C. Section 706(2)."

Until further notice, the June 29, 2015 WOTUS Rule is not in effect. Furthermore, this report does not attempt to include a professional opinion as it relates to the June 29, 2015 WOTUS Rule.

2.2 Waters of the State

"Waters of the State" are within the jurisdiction of the Ohio Environmental Protection Agency (OEPA). They are generally defined as surface and underground water bodies, which extend through or exist wholly in the State of Ohio, which includes, but is not limited to, streams and both isolated and non-isolated wetlands. Private ponds, or any pond, reservoir, or facility built for reduction of pollutants prior to discharge are not included in this definition. In addition to "waters of the U.S.", OEPA also regulates and issues permits for isolated wetland impacts.

OEPA relies on the USACE decision regarding wetland determinations and delineations including whether or not a wetland is isolated or non-isolated.

2.3 Wetlands

Wetlands are a category of "waters of the U.S." for which a specific identification methodology has been developed. As described in detail in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), wetland boundaries are delineated using three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In addition to the criteria defined in the 1987 Manual, the procedures described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (Environmental Laboratory, 2012) were used to evaluate the Study Area for the presence of wetlands.

2.3.1 Hydrophytic Vegetation

On June 1, 2012, the National Wetland Plant List (NWPL), formerly called the National List of Plant Species that Occur in Wetlands (Reed 1988), went into effect after being released by the U.S. Army Corps of Engineers (USACE) as part of an interagency effort with the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (Lichvar and Kartesz, 2009). The NWPL, along with the information implied by its wetland plant species status ratings, provides general botanical information about wetland plants and is used extensively in wetland delineation, restoration, and mitigation efforts. The NWPL consists of a comprehensive list of wetland plant species that occur within the United States along with their respective wetland indicator statuses by region. An indicator status reflects the likelihood that a particular plant species occurs in a wetland or upland (Lichvar et al. 2012). Definitions of the five indicator categories are presented below.

OBL (Obligate Wetland Plants): almost always occur in wetlands. With few exceptions, these plants (herbaceous or woody) are found in standing water or seasonally saturated soils (14 or more consecutive days) near the surface. These plants are of four types: submerged, floating, floating-leaved, and emergent.

FACW (Facultative Wetland Plants): usually occur in wetlands, but may occur in non-wetlands. These plants predominately occur with hydric soils, often in geomorphic settings where water saturates the soils or floods the soil surface at least seasonally.

FAC (Facultative Plants): occur in wetlands and non-wetlands. These plants can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil pH, and elevation, and they have a wide tolerance of soil moisture conditions.

FACU (Facultative Upland Plants): usually occur in non-wetlands, but may occur in wetlands. These plants predominately occur on drier or more mesic sites in geomorphic settings where water rarely saturates the soils or floods the soil surface seasonally.

UPL (Upland Plants): almost never occur in wetlands. These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.

According to the USACE's Midwest Regional Supplement, plants that are rated as FAC, FACW, or OBL are classified as wetland plant species. The percentage of dominant wetland species in each of the four vegetation strata (tree, shrub/sapling, herbaceous, and woody vine) in the sample area determines the hydrophytic (wetland) status of the plant community. Dominant species are chosen independently from each stratum of the community. In general, dominants are the most abundant species that individually or collectively account for more than 50 percent of the total coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total.

For the purposes of determining dominant plant species, the four vegetation strata are defined. Trees consist of woody species 3 inches or greater in diameter at breast height (DBH). Shrubs and saplings are woody species that are over 1 meter in height and less than 3 inches DBH. Herbaceous species consist of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants less than 1 meter tall. Woody vines consist of vine species greater than 1 meter in height, such as wild grapes.

2.3.2 Hydric Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. In general, hydric soils are flooded, ponded, or saturated for a week or more during the growing season when soil temperatures are above 32 degrees Fahrenheit. The anaerobic conditions created by repeated or prolonged saturation or flooding result in permanent changes in soil color and chemistry, which are used to differentiate hydric from non-hydric soils.

In this report, soil colors are described using the Munsell notation system. This method of describing soil color consists of separate notations for hue, value, and chroma that are combined in that order to form the color designation. The hue notation of a color indicates its relation to red, yellow, green, blue, and purple; the value notation indicates its lightness, and the chroma notation indicates its strength or departure from a neutral of the same lightness.

The symbol for hue consists of a number from 1 to 10, followed by the letter abbreviation of the color. Within each letter range, the hue becomes more yellow and less red as the numbers increase. The notation for value consists of numbers from 0 for absolute black, to 10 for absolute white. The notation for chroma consists of numbers beginning with /0 for neutral grays and increasing at equal intervals. A soil described as 10YR 3/1 soil is more gray than a soil designated 10YR 3/6.

2.3.3 Wetland Hydrology

Wetland hydrology is defined as the presence of water for a significant period of time at or near the surface (within the root zone) during the growing season. Wetland hydrology is present only seasonally in many cases, and is often inferred by indirect evidence. Hydrology is controlled by such factors as seasonal and long-term rainfall patterns, local geology and topography, soil type, local water table conditions, and drainage. Primary indicators of hydrology are inundation, soil saturation in the upper 12 inches of the soil, watermarks, sediment deposits, and drainage patterns. Secondary indicators such as oxidized root channels in the upper 12 inches of the soil, water-stained leaves, local soil survey data, and the FAC-neutral vegetation test are sometimes used to identify hydrology. A primary indicator or two or more secondary indicators are required to establish a positive indication of hydrology.

2.3.4 Wetland Definition Summary

In general, an area must meet all three criteria to be classified as a wetland. In certain problem areas such as seasonal wetlands, which are not wet at all times, or in recently disturbed (atypical) situations, areas may be considered a wetland if only two criteria are met. In special situations, an area that meets the wetland definition may not be within the USACE's jurisdiction due to a specific regulatory exemption.

2.4 Streams, Rivers, Watercourses & Jurisdictional Ditches

With non-tidal waters, in the absence of adjacent wetlands, the extent of the USACE's jurisdiction is defined by the OHWM. USACE regulations define the term "ordinary high water mark" for purposes of the CWA lateral jurisdiction at 33 CFR 328.3(e), which states:

> The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Streams, rivers, watercourse, and ditches within the Study Area were evaluated using the above definition and documented. Waterways that did exhibit an OHWM were recorded and evaluated using the Ohio Environmental Protection Agency's Primary Headwater Habitat Evaluation (HHEI) or Qualitative Habitat Evaluation Index (QHEI) methodology. If applicable, the results of the HHEI and/or QHEI are presented in Section 3.2.

2.5 Endangered Species Act

Endangered, Threatened, and rare (ETR) species are protected at both the state and federal level (ORC 1531.25 and 50 CFR 17.11 through 17.12, respectively). The Ohio Revised Code defines "Take" as to harass, hunt, capture, or kill; or attempt to harass, hunt, capture, or kill.

The USFWS, under authority of the Endangered Species Act of 1973 (16 U.S. Code 1531), as amended, has the responsibility for federally listed species. The Ohio Department of Natural Resources (ODNR) has the responsibility for state listed species.

3 Background Information

3.1 Existing Maps

Several sources of information were consulted to identify potential wetlands and wetland soil units on the site. These include the USFWS's *National Wetland Inventory* (NWI), the USGS's *National Hydrography Dataset* (NHD), and the Natural Resources Conservation Service's (NRCS) *Soil Survey* for this county. These maps identify potential wetlands and wetland soil units on the site. The NHD maps are used to portray surface water. The NWI maps were prepared from high altitude photography and in most cases were not field checked. Because of this, wetlands are sometimes erroneously identified, missed, or misidentified. Additionally, the criteria used in identifying these wetlands were different from those currently used by the USACE. The county soil maps, on the other hand, were developed from actual field investigations. However, they address only one of the three required wetland criteria and may reflect historical conditions rather than current site conditions. The resolution of the soil maps limits their accuracy as well. The

mapping units are often generalized based on topography and many mapping units contain inclusions of other soil types for up to 15 percent of the area of the unit. The USACE does not accept the use of either of these maps to make wetland determinations.

3.1.1 National Wetland Inventory

The NWI map of the area (Figure 4) identified one Riverine, Intermittent Streambed, Seasonally Flooded (R4SBC) wetland feature within the Study Area.

3.1.2 National hydrography Dataset

The NHD dataset (Figure 4) identified one surface water within the Study Area.

3.1.3 Soil Survey

The NRCS Soil Survey identified twelve (12) soil types located within the Study Area (Figure 3). The following table identifies the soil unit symbol, soil unit name, and whether or not the soil type contains components that meet the hydric soil criteria.

Table 3 – 2 Soil Map Units within the F3886 Port Union to Muhlhauser Rebuild Project Area

Symbol	Description	Hydric
DaB	Dana silt loam, 2 to 6 percent slopes	No
EcF2	Eden silty clay loam, 25 to 50 percent slopes, moderately eroded	No
FcA	Fincastle silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	No
HoA	Henshaw silt loam, 0 to 2 percent slopes	No
MsD2	Miamian-Russell silt loams, 12 to 18 percent slopes, moderately eroded	No
MtC2	Miamian-Russell silt loams, bedrock substratum, 6 to 12 percent slopes, eroded	No
Pa	Patton silty clay loam, 0 to 2 percent slopes	Yes
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	Yes
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	No
RwB2	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes, moderately eroded	No
Ud	Udorthents	No
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	No

4 Methodology and Description

4.1 Regulated Waters Investigation

The delineation of regulated waters within the Study Area was based on the methodology described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (Environmental Laboratory, 2010) as required by current USACE policy.

Prior to the fieldwork, the background information was reviewed to establish the probability and potential location of wetlands on the site. Next, a general reconnaissance of the Study Area was conducted to determine site conditions. The site was then walked with the specific intent of determining wetland boundaries. Data stations were established at locations within and near the wetland areas to document soil characteristics, evidence of hydrology and dominant vegetation. Note that no attempt was made to examine a full soil profile to confirm any soil series designations.

However, when possible, soils were examined to a depth of at least 16 inches to assess soil characteristics and site hydrology. Complete descriptions of typical soil series can be found in the soil survey for these counties.

4.1.1 Site Photographs.

Photographs of the site are located in Appendix A. These photographs are the visual documentation of site conditions at the time of inspection. The photographs are intended to provide representative visual samples of any wetlands or other special features found on the site.

4.2 Technical Descriptions

The project included the review of a 100-ft wide survey corridor approximately 2.74-miles long (the "Study Area"), located in the City of Fairfield and West Chester Township, Butler County, Ohio (see Figure 1). The Study Area consists of approximately 33.4 acres, with an actual project earth disturbance potential of approximately 4.6 acres. The F3886 Port Union to Muhlhauser Rebuild Project initiates at the Duke Energy Muhlhauser Substation located south of Muhlhauser Road, north of W Crescentville Road, and east of Dixie Highway (SR4) (39.308443, -84.486188) and terminates at the Duke Energy Port Union Substation located north of the Rialto Road and Port Union Road intersection (39.326641, -84.450244). The Study Area consisted five habitat types: maintained ROW/oldfield, urban turf/impervious surfaces, agricultural land, emergent wetland, and emergent/scrub-shrub wetland complex.

4.2.1 Data Point and Wetland Descriptions

Pond 1 (0.02-acre within the Study Area)

Pond 1 was a freshwater excavated pond in both hydric and non-hydric soils. It is our best professional judgement based on desktop review and topography that Pond 1 discharges into Stream 6, a tributary to Mill Creek that ultimately flows into the Ohio River, a Traditional Navigable Water (TNW). Due to this connection, Pond 1 should be considered a jurisdictional water of the United States.

Wetland 1 (0.01-acre within the Study Area)

Wetland 1 (W01) was small palustrine emergent wetland (PEM) located along a constructed ditch. W01 discharges into Stream 1, a tributary to Mill Creek which flows into the Ohio River, a "Traditionally Navigable Water." Due to this significant nexus via Stream 1, this wetland should be considered a jurisdictional "water of the U.S.". The ORAM score for W01 was 26.0, categorizing the wetland as a Category 1, or low quality wetland. A complete ORAM field data sheet is located in Appendix D.

Wetland Data Point

Data Point 01 (DP01)

Dominant vegetation in the vicinity of DP01 included dark-green bulrush (*Scirpus atrovirens*, OBL), and common fox sedge (*Carex vulpinoidea*, FACW). In addition, non-dominant vegetation observed included Frank's sedge (*Carex frankii*, OBL), white panicled American-aster (*Symphyotrichum lanceolatum*, FAC), blunt spike-rush (*Eleocharis obtusa*, OBL), giant ironweed (*Vernonia gigantea*, FAC), chufa (*Cyperus esculentus*, FACW), spotted lady's-thumb (*Persicaria maculosa,* FACW), and Fuller's teasel (*Dipsacus fullonum*, FACU). The plants at this data point qualified as hydrophytic vegetation. The soil from 0 to 3 inches had a matrix soil color of 10YR 4/2 with a texture of silty clay loam. The soil from 3 to 16 inches had a matrix soil color of 10YR 5/4 with concentrations in the matrix at 5 percent, and a texture of silty clay loam. The soil at the data point was mapped as Henshaw silt loam, 0 to 2 percent slopes (HoA), and met the redox depressions (F8) hydric soil criteria. Primary indicators of hydrology included surface water (A1),

saturation (A3), and secondary indicators of hydrology observed included geomorphic position (D2), and the FAC-neutral test (D5). This data point qualified as a wetland.

Upland Data Point
Data Point 02 (DP02)
Dominant vegetation in the vicinity of DP02 included red fescue (*Festuca rubra*, FACU). In addition, non-dominant vegetation observed included hairy crab grass (*Digitaria sanguinalis*, FACU). The plants at this data point did not qualify as hydrophytic vegetation criteria. The soil from 0 to 8 inches had a matrix soil color of 10YR 4/2 with a texture of silty clay loam. The soil from 8 to 16 inches had a matrix soil color of 10YR 5/3 with concentrations in the matrix at 2 percent, and a texture of silty clay loam. The soil at the data point was mapped as Henshaw silt loam, 0 to 2 percent slopes (HoA), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Wetland 2 (0.14-acre within the Study Area)
Wetlands 2 (W02) was a palustrine emergent and scrub-shrub wetland complex (PEM/PSS). W02 developed along the riparian area of Stream 1, a tributary to Mill Creek which flows into the Ohio River, a "Traditionally Navigable Water." Due to this significant nexus via Stream 1, this wetland should be considered a jurisdictional "water of the U.S.". The ORAM score for W02 was 48.0, categorizing the wetland as a Category 2, or moderate quality wetland. A complete ORAM field data sheet is located in Appendix D.

Wetland Data Point
Data Point 03 (DP03)
Dominant vegetation in the vicinity of DP03 included black willow (*Salix nigra*, OBL), silky dogwood (*Cornus amomum*, FACW), ash-leaf maple (*Acer negundo*, FAC), hybrid cattail (*Typha X glauca*, OBL), Canadian horseweed (*Erigeron canadensis*, FACU), and reed canary grass (*Phalaris arundinacea*, FACW). In addition, non-dominant vegetation observed included New England American-aster (*Symphyotrichum novae-angliae*, FACW), spotted touch-me-not (*Impatiens capensis*, FACW), dark-green bulrush (*Scirpus atrovirens*, OBL), Fuller's teasel (*Dipsacus fullonum*, FACU), flat-top goldentop (*Euthamia graminifolia*, FACW), common fox sedge (*Carex vulpinoidea*, FACW), spotted lady's-thumb (*Persicaria maculosa*, FACW), and crested sedge (*Carex cristatella*, FACW). The plants at this data point qualified as hydrophytic vegetation. The soil from 0 to 16 inches had a matrix soil color of 10YR 3/1 with concentrations in the matrix at 5 percent, and a texture of silty clay loam. The soil at the data point was mapped as Udorthents (Ud), and met the redox dark surface (F6), and redox depressions (F8) hydric soil criteria. Primary indicators of hydrology included saturation (A3), and secondary indicators of hydrology observed included crayfish burrows (C8), geomorphic position (D2), and the FAC-neutral test (D5). This data point qualified as a wetland.

Upland Data Point
Data Point 04 (DP04)
Dominant vegetation in the vicinity of DP04 included red fescue (*Festuca rubra*, FACU), and Johnson grass (*Sorghum halepense*, FACU). In addition, non-dominant vegetation observed included red clover (*Trifolium pratense*, FACU), Fuller's teasel (*Dipsacus fullonum*, FACU), Canadian thistle (*Cirsium arvense*, FACU), and eastern daisy fleabane (*Erigeron annuus*, FACU). The plants at this data point did not qualify as hydrophytic vegetation criteria. The soil from 0 to 16 inches had a matrix soil color of 10YR 3/1 with a texture of silt loam. The soil at the data point was mapped as Udorthents (Ud), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Wetland 3 (0.26-acre within the Study Area)

Wetlands 3 (W03) was a palustrine emergent and scrub-shrub wetland complex (PEM/PSS). W03 developed along the riparian area of Stream 7, a tributary to Mill Creek that flows into the Ohio River, a "Traditionally Navigable Water." Due to this significant nexus via Stream 7, this wetland should be considered a jurisdictional "water of the U.S.". The ORAM score for W03 was 45.0, categorizing the wetland as a Category 2, or moderate quality wetland. A complete ORAM field data sheet is located in Appendix D.

Wetland Data Point

Data Point 05 (DP05)

Dominant vegetation in the vicinity of DP05 included black willow (Salix nigra, OBL), broad-leaf cattail (*Typha latifolia*, OBL), and reed canary grass (*Phalaris arundinacea*, FACW). In addition, non-dominant vegetation observed included green ash (*Fraxinus pennsylvanica*, FACW), spotted touch-me-not (*Impatiens capensis*, FACW), dark-green bulrush (*Scirpus atrovirens*, OBL), white snakeroot (*Ageratina altissima*, FACU), Torrey's rush (*Juncus torreyi*, FACW), and giant ironweed (*Vernonia gigantea*, FAC). The plants at this data point qualified as hydrophytic vegetation. The soil from 0 to 2 inches had a matrix soil color of 10YR 3/1 with a texture of muck. The soil from 2 to 16 inches had a matrix soil color of 10YR 3/1 with a texture of silty clay loam. The soil at the data point was mapped as Eden silty clay loam, 25 to 50 percent slopes, moderately eroded (EcF2), and met the histic epipedon (A2), and 2 cm muck (A10) hydric soil criteria. Primary indicators of hydrology included surface water (A1), saturation (A3), and secondary indicators of hydrology observed included geomorphic position (D2), and the FAC-neutral test (D5). This data point qualified as a wetland.

Upland Data Point

Data Point 06 (DP06)

Dominant vegetation in the vicinity of DP06 included Amur honeysuckle (*Lonicera maackii*, UPL) in multiple strata. In addition, non-dominant vegetation observed included Canadian goldenrod (*Solidago canadensis*, FACU), spotted touch-me-not (*Impatiens capensis*, FACW), eastern woodland sedge (*Carex blanda*, FAC), Japanese honeysuckle (*Lonicera japonica*, FACU), summer grape (*Vitis aestivalis*, FACU), and cress-leaf groundsel (*Packera glabella*, FACW). The plants at this data point did not qualify as hydrophytic vegetation criteria. The soil from 0 to 3 inches had a matrix soil color of 10YR 3/2 with a texture of silty clay loam. The soil at the data point was mapped as Eden silty clay loam, 25 to 50 percent slopes, moderately eroded (EcF2), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Wetland 4 (0.99-acre within the Study Area)

Wetlands 4 (W04) was a palustrine emergent wetland (PEM). W04 developed along the riparian area of Stream 8, a tributary to Mill Creek which flows into the Ohio River, a "Traditionally Navigable Water." Due to this significant nexus via Stream 8, this wetland should be considered a jurisdictional "water of the U.S.". The ORAM score for W04 is 47.0, categorizing the wetland as a Category 2, or moderate quality wetland. A complete ORAM field data sheet is located in Appendix D.

Wetland Data Point
Data Point 07 (DP07)
Dominant vegetation in the vicinity of DP07 included blunt spike-rush (*Eleocharis obtusa*, OBL), and creeping-Jenny (*Lysimachia nummularia*, FACW). In addition, non-dominant vegetation observed included Torrey's rush (*Juncus torreyi*, FACW), common three-seed-mercury (*Acalypha rhomboidea*, FACU), Rufous bulrush (*Scirpus pendulus*, OBL), curly dock (*Rumex crispus*, FAC), dark-green bulrush (*Scirpus atrovirens*, OBL), common fox sedge (*Carex vulpinoidea*, FACW), swamp milkweed (*Asclepias incarnata*, OBL), white panicled American-aster (*Symphyotrichum lanceolatum*, FAC), Frank's sedge (*Carex frankii*, OBL), and cut-leaf water-horehound (*Lycopus americanus*, OBL). The plants at this data point qualified as hydrophytic vegetation. The soil from 0 to 16 inches had a matrix soil color of 10YR 3/1 with concentrations in the matrix at 10 percent, and a texture of sandy clay loam. The soil at the data point was mapped as Patton silty clay loam, 0 to 2 percent slopes (Pa), and met the redox dark surface (F6), and redox depressions (F8) hydric soil criteria. Primary indicators of hydrology included saturation (A3), and secondary indicators of hydrology observed included geomorphic position (D2), and the FAC-neutral test (D5). This data point qualified as a wetland.

Upland Data Point
Data Point 08 (DP08)
Dominant vegetation in the vicinity of DP08 included Canadian goldenrod (*Solidago canadensis*, FACU), and giant ironweed (*Vernonia gigantea*, FAC). In addition, non-dominant vegetation observed included annual ragweed (*Ambrosia artemisiifolia*, FACU), late-flowering Thoroughwort (*Eupatorium serotinum*, FAC), Fuller's teasel (*Dipsacus fullonum*, FACU), Japanese bristle grass (*Setaria faberi*, FACU), yellow sweet-clover (*Melilotus officinalis*, FACU), Virginia-creeper (*Parthenocissus quinquefolia*, FACU), Allegheny blackberry (*Rubus allegheniensis*, FACU), indian-hemp (*Apocynum cannabinum*, FAC), devil's-pitchfork (*Bidens frondosa*, FACW), white avens (*Geum canadense*, FAC), spotted touch-me-not (*Impatiens capensis*, FACW), curly dock (*Rumex crispus*, FAC), and white vervain (*Verbena urticifolia*, FAC). The plants at this data point did not qualify as hydrophytic vegetation criteria. The soil from 0 to 16 inches had a matrix soil color of 10YR 3/1 with a texture of silty clay loam. The soil at the data point was mapped as Patton silty clay loam, 0 to 2 percent slopes (Pa), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

4.2.2 Stream Descriptions

Stream 1 (Unnamed Tributary to Mill Creek – 1,598 Linear Feet within the Study Area)

Stream 1 (S01) was a perennial stream that flowed east through the Study Area. The dominant substrates were sand and silt. Ordinary High Water Mark (OHWM) width of S01 was approximately six feet and depth was 2.5 feet. The maximum pool depth observed was approximately twelve inches. S01 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 53 for S01. Complete HHEI field data sheets are located in Appendix D.

Stream 2 (Unnamed Tributary to Mill Creek – 54 Linear Feet within the Study Area)

Stream 2 (S02) was an intermittent stream that flowed south through the Study Area. The dominant substrates were gravel and silt. OHWM width of S02 was approximately ten feet and depth was 1.5 feet. The maximum pool depth observed was approximately four inches. S02flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream

should be considered a jurisdictional "water of the United States." The HHEI score was 66 for S02. Complete HHEI field data sheets are located in Appendix D.

Stream 3 (Unnamed Tributary to Mill Creek – 78 Linear Feet within the Study Area)

Stream 3 (S03) was an intermittent stream that flowed south through the Study Area. The dominant substrates were sand and silt. OHWM width of S03 was approximately five feet and depth was one-foot. The maximum pool depth observed was approximately four inches. S03 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 58 for S03. Complete HHEI field data sheets are located in Appendix D.

Stream 4 (Unnamed Tributary to Mill Creek – 259 Linear Feet within the Study Area)

Stream 4 (S04) was an intermittent stream that flowed east through the Study Area. The dominant substrates were sand and clay/hardpan. OHWM width of S04 was approximately seven feet and depth was 1.5 feet. The maximum pool depth observed was approximately three inches. S04 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 51 for S04. Complete HHEI field data sheets are located in Appendix D.

Stream 5 (Unnamed Tributary to Mill Creek – 113 Linear Feet within the Study Area)

Stream 5 (S05) was an intermittent stream that flowed south through the Study Area. The dominant substrates were gravel and silt. OHWM width of S05 was approximately nine feet and depth was two feet. The maximum pool depth observed was approximately two to three inches. S05 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 61 for S05. Complete HHEI field data sheets are located in Appendix D.

Stream 6 (Unnamed Tributary to Mill Creek – 164 Linear Feet within the Study Area)

Stream 6 (S06) was an intermittent stream that flowed east through the Study Area. The dominant substrates were gravel and sand. OHWM width of S06 was approximately eleven feet and depth was two feet. The maximum pool depth observed was approximately four inches. S06 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 69 for S06. Complete HHEI field data sheets are located in Appendix D.

Stream 7 (Unnamed Tributary to Mill Creek – 246 Linear Feet within the Study Area)

Stream 7 (S07) was an intermittent stream that flowed east through the Study Area. The dominant substrates were sand and clay/hardpan. OHWM width of S07 was approximately five feet and depth was 1.5 feet. The maximum pool depth observed was approximately four inches. S07 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should be considered a jurisdictional "water of the United States." The HHEI score was 54 for S07. Complete HHEI field data sheets are located in Appendix D.

Stream 8 (Unnamed Tributary to Mill Creek – 232 Linear Feet within the Study Area)

Stream 8 (S08) was an intermittent stream that flowed northeast through the Study Area. The dominant substrates were silt. OHWM width of S08 was approximately fifteen feet and depth was 2.5 feet. The maximum pool depth observed was approximately ten inches. S08 flows into Mill Creek which is a tributary to the Ohio River, a TNW. Due to this connection, this stream should

be considered a jurisdictional "water of the United States." The HHEI score was 63 for S08. Complete HHEI field data sheets are located in Appendix D.

4.2.3 Non-Jurisdictional Aquatic Feature Descriptions

Non-Jurisdictional Ditches

Numerous non-jurisdictional ditches which lacked bed, bank, and OHWM were identified within the Study Area. These channels were characterized as small to moderate depressions created to channel water. Many of the identified ditches serve as drainage, transporting water from low-lying areas, alongside roadways or fields.

4.3 Endangered, Threatened and Rare Species

The potential for listed species known to occur within Butler County were evaluated based on the habitat observed within the Study Area. In addition, high quality natural communities and significant natural habitat areas were documented if encountered. A walking survey of the Study Area was performed in which all observed Endangered, Threatened and Rare (ETR) species or specific known special habitats were noted. Coordination with the U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR) Division of Wildlife (DOW) occurred as it related to the Natural Heritage Database search results for the Study Area (Appendix E).

Tables summarizing the results of ETR species as they relate to the habitat observed within the Study Area are included with this report. Correspondence with the ODNR-DOW and the USFWS regarding RTE located within a ½-mile of the Study Area were sent August 28, 2019. The copies of the USFWS and ODNR-DOW response letters are located in Appendix E.

Bat Roost Habitat

The Indiana bat (*Myotis sodalis*, federally endangered) and northern long-eared bat (*Myotis septentrionalis*, federally threatened) are protected under the Endangered Species Act, which is overseen by the USFWS. Typical guidance from USFWS regarding potential bat roost trees is avoidance of cutting trees from April through October. The Study Area was assessed for potential bat roosting habitat with respect to any indicated clearing activities. Potential bat roost trees include dead or dying trees (including live shagbark hickories) with at least 10-percent exfoliating bark, a diameter at breast height (DBH) of at least 3 inches, and solar exposure for maternity roost trees (the tree is on a wooded edge or in a canopy gap). If applicable, correspondence from USFWS regarding Indiana bat and northern long-eared bat is included within Appendix E.

The entire Study Area was surveyed to identify potential Indiana bat and northern long-eared bat roost trees. Based on our field inspection and our best professional judgment, there was low to moderate quality suitable bat roost habitat observed within the Study Area.

5 Jurisdictional Analysis

5.1 U.S. Army Corps of Engineers

The USACE has authority over the discharge of fill or dredged material into "waters of the U.S.". This includes authority over any filling, mechanical land clearing, or construction activities that

occur within the boundaries of any "waters of the U.S.". A permit must be obtained from the USACE before any of these activities occur. Permits can be divided into two general categories: Individual Permits and Nationwide Permits.

Individual Permits are required for projects that do not fall into one of the specific Nationwide Permits or are deemed to have significant environmental impacts. These permits are much more difficult to obtain and receive a much higher level of regulatory agency and public scrutiny and may require several months to more than a year for processing.

Nationwide Permits have been developed for projects that meet specific criteria and are deemed to have minimal impact on the aquatic environment. There are currently 52 Nationwide Permits for qualifying activities with 31 Nationwide Permit General Conditions that must be satisfied in order to receive NWP consideration from the USACE.

5.2 Ohio Environmental Protection Agency

The OEPA is responsible for issuing Clean Water Act (CWA) Section 401 permits known as Water Quality Certifications (WQC) for all impacts to "waters of the State of Ohio." This includes authority over any dredging, filling, mechanical land clearing, impoundments or construction activities that occur within the boundaries of any "waters of the State," including those isolated waters not otherwise regulated by the USACE.

The OEPA issues Section 401 WQC in conjunction with the USACE' Section 404 permits. A Section 401 Water Quality Certification must be received before the USACE can issue any Section 404 Department of the Army Permit. The OEPA must issue Individual Section 401 WQC for all Individual Section 404 Permits.

Water quality certification may be granted, without notification to the OEPA, if the project falls under the NWP limitations described above. In order to qualify for this granted certification, all prior-authorized and *de minimis* Ohio State Certification General Limitations and Conditions as published by the OEPA must be satisfied.

The OEPA also requires notification for all impacts to isolated wetlands, which includes a permit application and mitigation plan pursuant to Section 6111 of Ohio Revised Code (ORC).

6 Summary and Conclusion

6.1 Summary

Cardno inspected the F3886 Port Union to Muhlhauser Rebuild Project Study Area on August 13 and 14, 2019. Table 6-1 summarizes the potentially regulated waters delineated within the Study Area.

6.1.1 Endangered, Threatened, and Rare Species

Several sources of information were consulted to further define the potential habitat of listed species that occur within the county of the Study Area. The table presented in Appendix E contains the list of ETR species known to occur within Butler County and their potential to occur within the Study Area based on their habitat requirements and field observations.

Correspondence with the ODNR-DOW and the USFWS regarding RTE species located within a ½-mile of the Study Area were sent August 28, 2019. Copies of the USFWS and ODNR-DOW correspondence letter receipts are located in Appendix E.

6.1.2 Indiana Bat and Northern Long-eared Bat Roost Habitat

The entire Study Area was surveyed to identify potential Indiana bat and northern long-eared Bat roost trees. Based on our field inspection and our best professional judgment, there is potential roost or maternity roost trees suitable for harboring Indiana Bats and Northern Long-eared Bats within the Study Area.

In the event tree clearing activity becomes a work priority within the Study Area, it is recommended that a field inspection be performed within the clearing limits to ensure that potential bat habitat has not developed.

The USFWS is the regulatory authority that makes the final determination as to the status of the Indiana bat and northern long-eared bat in the Study Area. A letter based on the field observations was submitted to the USFWS and ODNR-DOW for concurrence on August 28, 2019. The copies of the USFWS and ODNR-DOW response letters are located in Appendix E.

Table 6-1 Features Identified within the F3886 Port Union to Muhlhauser Rebuild Study Area

Feature Name	USGS/ NWI Identified	Feature Class	Regulatory Status[1]	Dimensions (ft)		Substrate	QHEI/HHEI/ ORAM Score	Linear Footage (LF)	Acreage (AC)
				Width	Depth				
Pond 1	No	Perennial	Jurisdictional	N/A	N/A	N/A	N/A	N/A	0.02
Wetland 1 (W01)	No	PEM	Jurisdictional	N/A	N/A	N/A	26	N/A	0.01
Wetland 2 (W02)	No	PEM/PSS	Jurisdictional	N/A	N/A	N/A	48	N/A	0.14
Wetland 3 (W03)	No	PEM/PSS	Jurisdictional	N/A	N/A	N/A	45	N/A	0.26
Wetland 4 (W04)	No	PEM	Jurisdictional	N/A	N/A	N/A	47	N/A	0.99
Stream 1 (S01)	Yes	Perennial	Jurisdictional	6	2.5	Sa-Si	53	1,598	0.22
Stream 2 (S02)	No	Intermittent	Jurisdictional	10	1.5	Gr-Si	66	54	0.01
Stream 3 (S03)	No	Intermittent	Jurisdictional	5	1	Sa-Si	58	78	0.01
Stream 4 (S04)	No	Intermittent	Jurisdictional	7	1.5	Sa-Cl	51	259	0.04
Stream 5 (S05)	No	Intermittent	Jurisdictional	9	2	Gr-Si	61	113	0.02
Stream 6 (S06)	No	Intermittent	Jurisdictional	11	2	Gr-Si	69	164	0.04
Stream 7 (S07)	No	Intermittent	Jurisdictional	5	1.5	Gr-Sa	54	246	0.03
Stream 8 (S08)	No	Intermittent	Jurisdictional	15	2.5	Si	63	232	0.05
Totals			Perennial			1,594 LF			0.22

	Intermittent			1,146 LF	0.20
	Pond			---	0.02
	Wetland	PEM	JD	---	1.00
	Wetland	PEM/ PSS	JD	---	0.40

[1] Regulatory Status is based on our "professional judgment" and experience; however the USACE makes the final determination.

6.2 Conclusion

There was one (1) pond, four (4) wetlands, and eight (8) streams identified within the Study Area.

While this report represents our best professional judgment based on our knowledge and experience, it is important to note that the Huntington District of the USACE has final discretionary authority over all jurisdictional determinations of 'waters of the U.S.' including wetlands under Section 404 of the CWA in this region.

7 References

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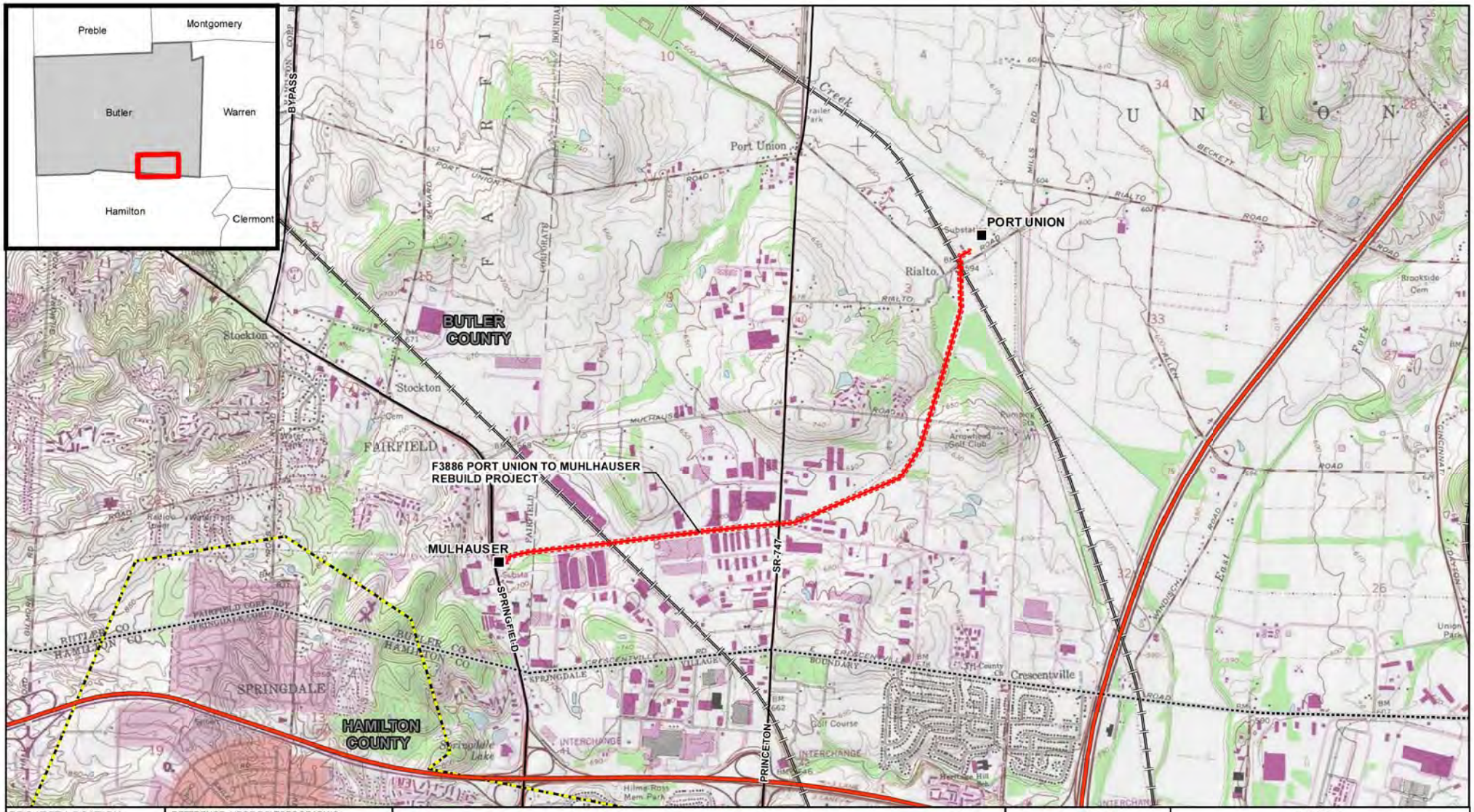
DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

FIGURES



PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Existing Facility
- Interstate
- State Highway
- US Highway
- Railroad
- Project Centerline
- 100-ft Corridor
- County Boundary
- Municipal Boundary

DUKE ENERGY.

Cardno

0 500 1,000 2,000 Feet

FIGURE 1
PROJECT VICINITY MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

DRAWN BY: SKL DATE: 10/17/2019
CHECKED: CAJ APPROVED: CAJ

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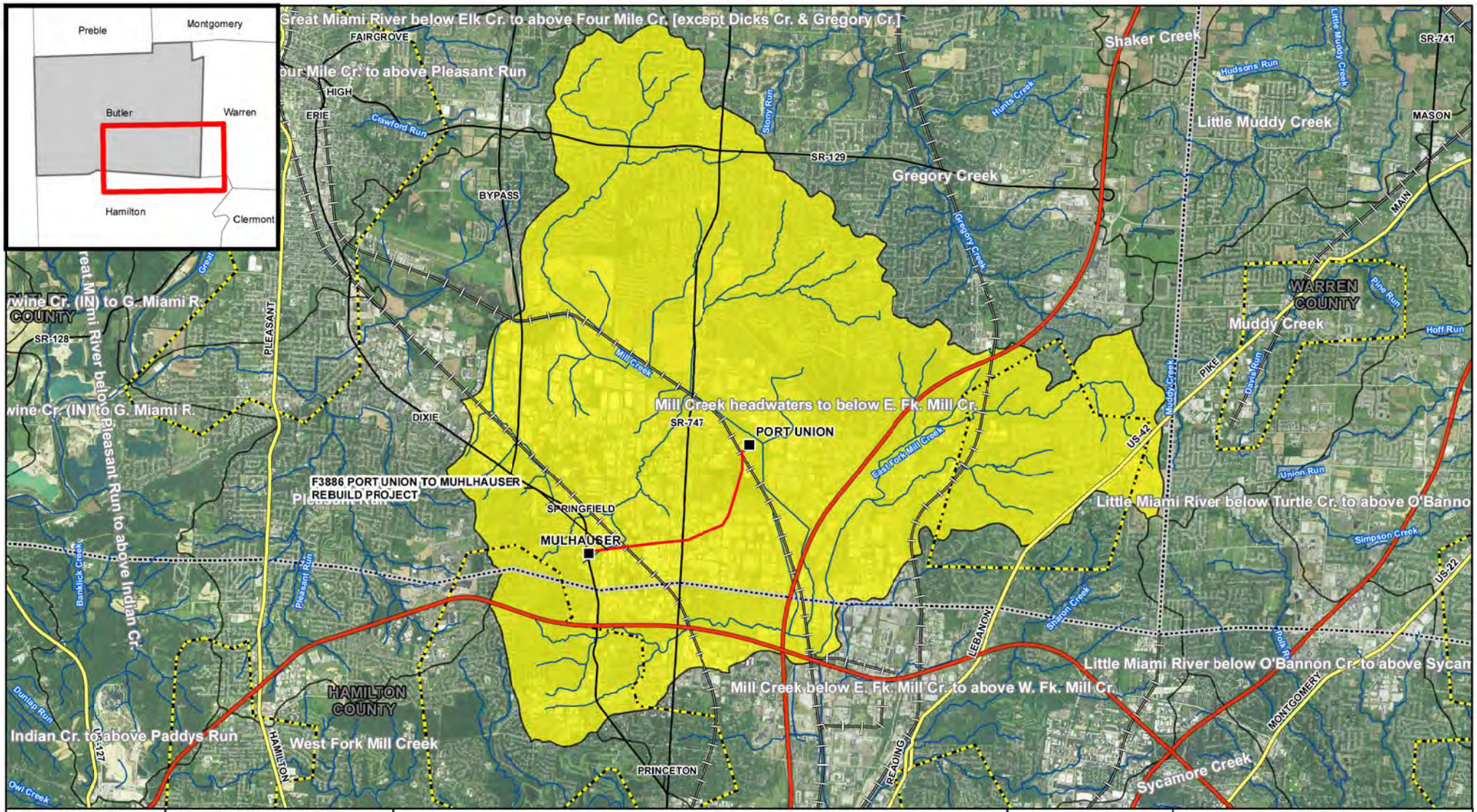

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Existing Facility
- NHD Flowline
- Interstate
- State Highway
- US Highway
- Railroad
- Project Centerline
- County Boundary
- Municipal Boundary
- Adjacent Watersheds
- Mill Creek headwaters to below E. Fk. Mill Cr.

DUKE ENERGY.

Cardno

0 1,000 2,000 4,000 6,000 8,000 Feet

FIGURE 2
PROJECT AREA WATERSHEDS

F3886 PORT UNION TO MULHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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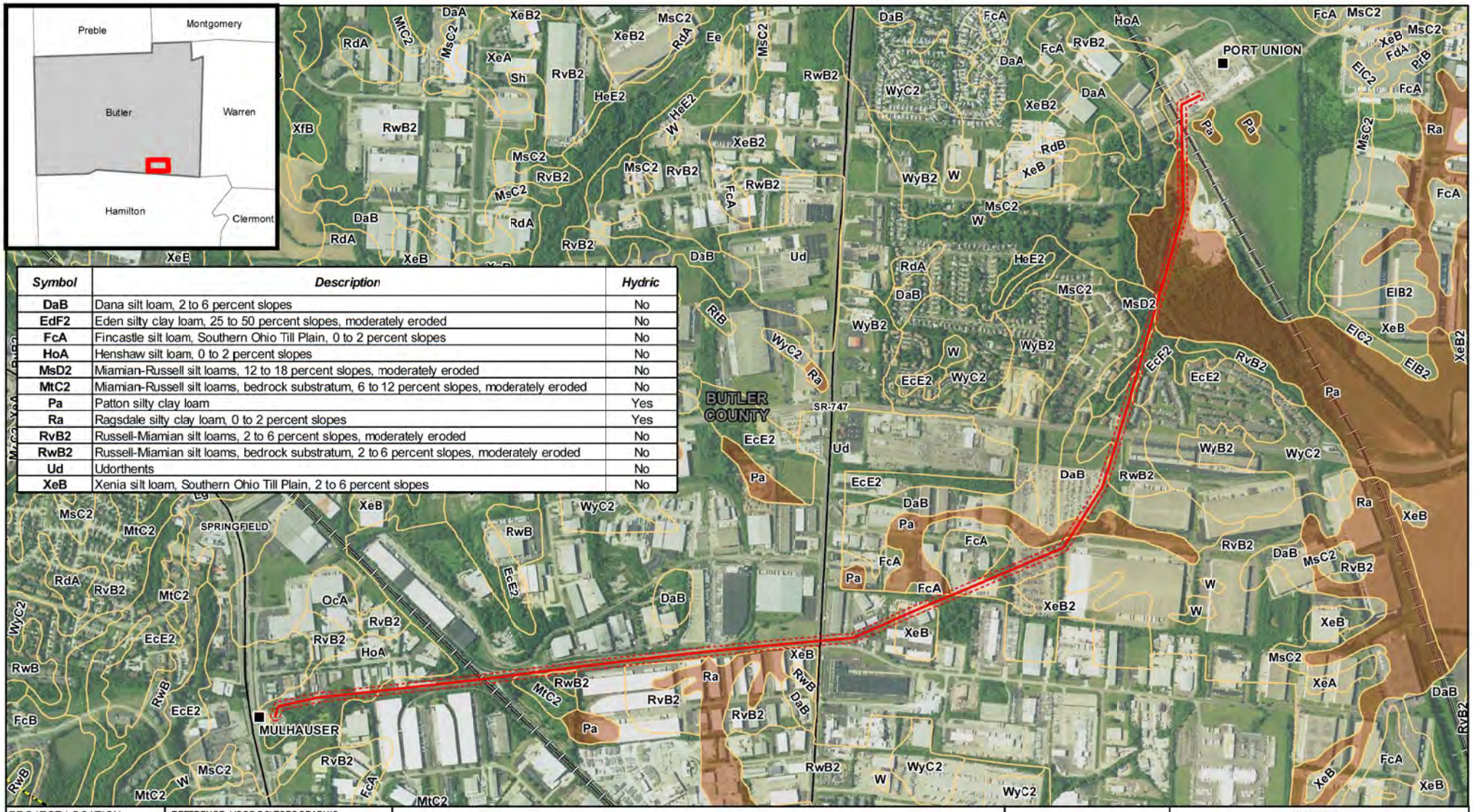

Symbol	Description	Hydric
DaB	Dana silt loam, 2 to 6 percent slopes	No
EdF2	Eden silty clay loam, 25 to 50 percent slopes, moderately eroded	No
FcA	Fincastle silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	No
HoA	Henshaw silt loam, 0 to 2 percent slopes	No
MsD2	Miamian-Russell silt loams, 12 to 18 percent slopes, moderately eroded	No
MtC2	Miamian-Russell silt loams, bedrock substratum, 6 to 12 percent slopes, moderately eroded	No
Pa	Patton silty clay loam	Yes
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	Yes
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	No
RwB2	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes, moderately eroded	No
Ud	Udorthents	No
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	No

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Existing Facility
- Interstate
- State Highway
- US Highway
- Railroad
- Project Centerline
- 100-ft Corridor
- County Boundary
- Municipal Boundary
- Soil Unit
- Soil Unit - Hydric

DUKE ENERGY.

Cardno

0 500 1,000 Feet

FIGURE 3
SOIL CLASSIFICATIONS

F3886 PORT UNION TO MULHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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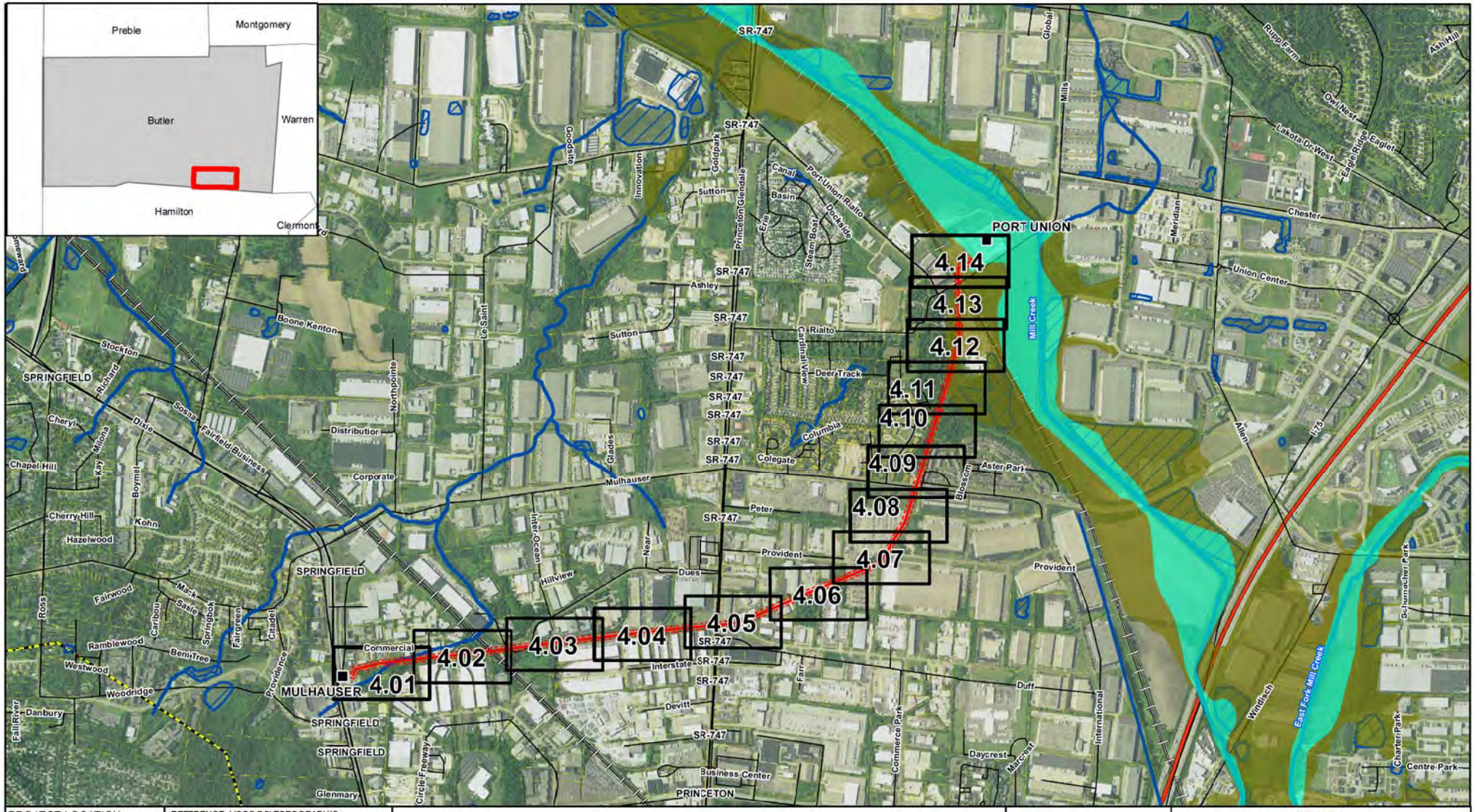
Preble
Montgomery
Butler
Warren
Hamilton
Clermont
PORT UNION
MULHAUSER
SPRINGFIELD
PRINCETON
4.14
4.13
4.12
4.11
4.10
4.09
4.08
4.07
4.06
4.05
4.04
4.03
4.02
4.01
SR-747
Mill Creek
East Fork Mill Creek
Sutton
Rialto
Mulhauser
Corporate
Distribution
Commercial
Interstate
Boone Kenton
Stockton
Richard
Cheryl
Chapel Hill
Cherry Hill
Hazelwood
Fairwood
Ramblewood
Westwood
Woodridge
Danbury
Fall River
Ross
Carbon
Mack
Sabie
Springbok
Fairgreen
Citadel
Providence
Bent Tree
Glenmary
Circle Freeway
Business Center
Commerce Park
Daycrest
Marcrest
Windisch
International
Duff
Devitt
Farr
Near
Dues
Hillview
Inter-Ocean
Peter
Provident
Colegate
Columbia
Deer Track
Meadowgate
Princeton Glendale
Ashley
Erie
Canal Basin
Steam Boat
Docksides
Port Union Rialto
Goodgate
Innovation
Goldpark
Le Saint
Northpointe
Glades
Dixie
Fairfield Business
Boymil
Kay
Milona
Sosna
Kohn
Meridian
Chester
Union Center
Allen
I-75
Blossom
Aster Park
Global
Mills
Rupp Farm
Owl Nest
Lakota Dr West
Eagle Ridge Eaglet
Ashi Hill
Gschurmacher Park
Charter Park
Centre Park
PROJECT LOCATION
BUTLER COUNTY, OH
REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.
Existing Facility
Interstate
NHD Flowline
Local Road
State Highway
US Highway
Railroad
Project Centerline
100-ft Corridor
Parcels
Municipal Boundary
Floodway
100-year Floodplain
NWI Wetlands
Sheet Index
DUKE ENERGY
Cardno
0 500 1,000 Feet
FIGURE 4
ENVIRONMENTAL ACCESS PLAN KEY MAP
F3886 PORT UNION TO MULHAUSER REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT
DUKE ENERGY OHIO
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APPROVED: CAJ
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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY.

Cardno

FIGURE 4.01
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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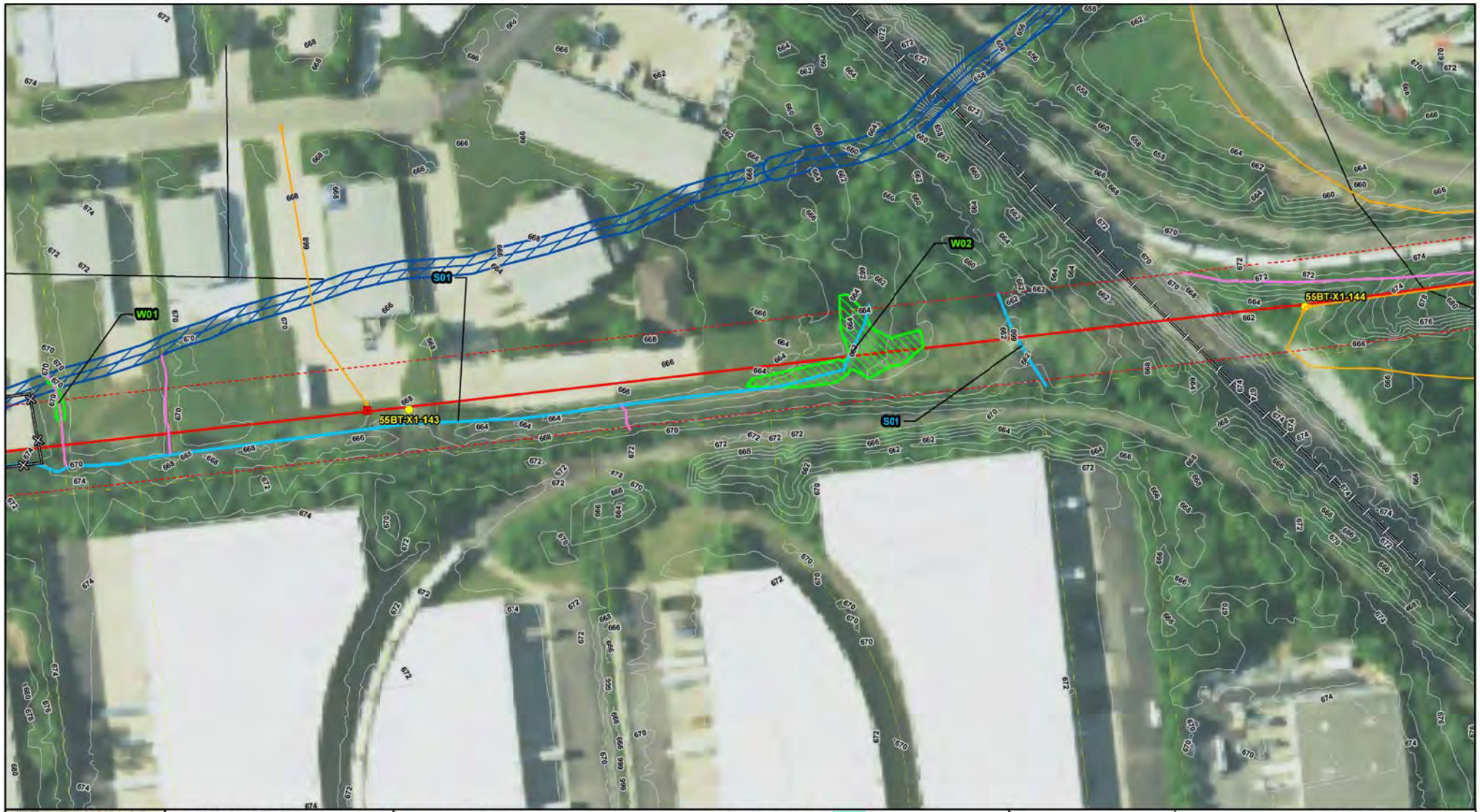

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.02
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.03
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

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FIGURE 4.04
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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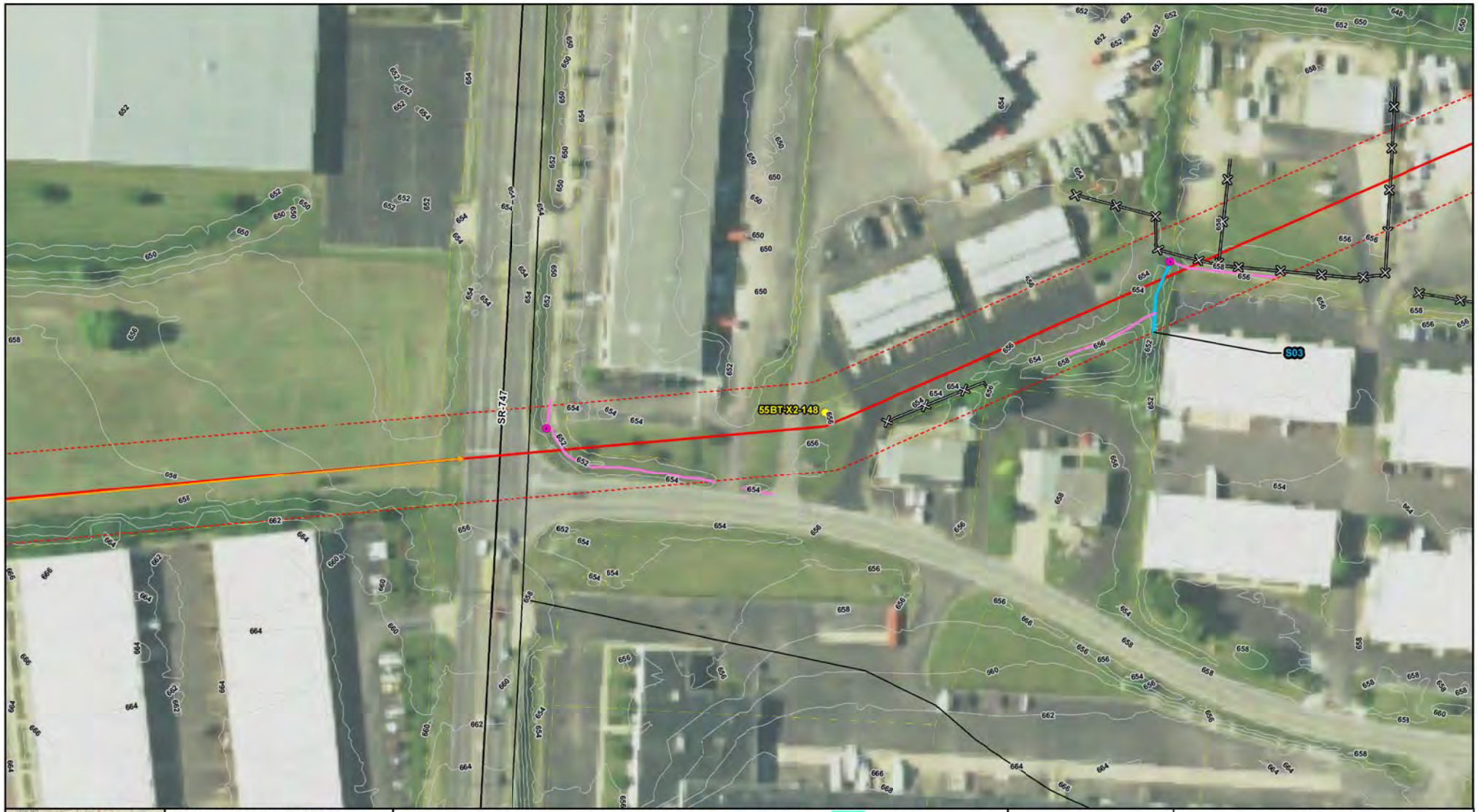

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.05
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

DRAWN BY: COD DATE: 10/17/2019
CHECKED: CAJ APPROVED: CAJ

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY.

Cardno

FIGURE 4.06
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

DRAWN BY: COD DATE: 10/17/2019
CHECKED: CAJ APPROVED: CAJ

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

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FIGURE 4.07
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY

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FIGURE 4.08
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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CHECKED: CAJ APPROVED: CAJ

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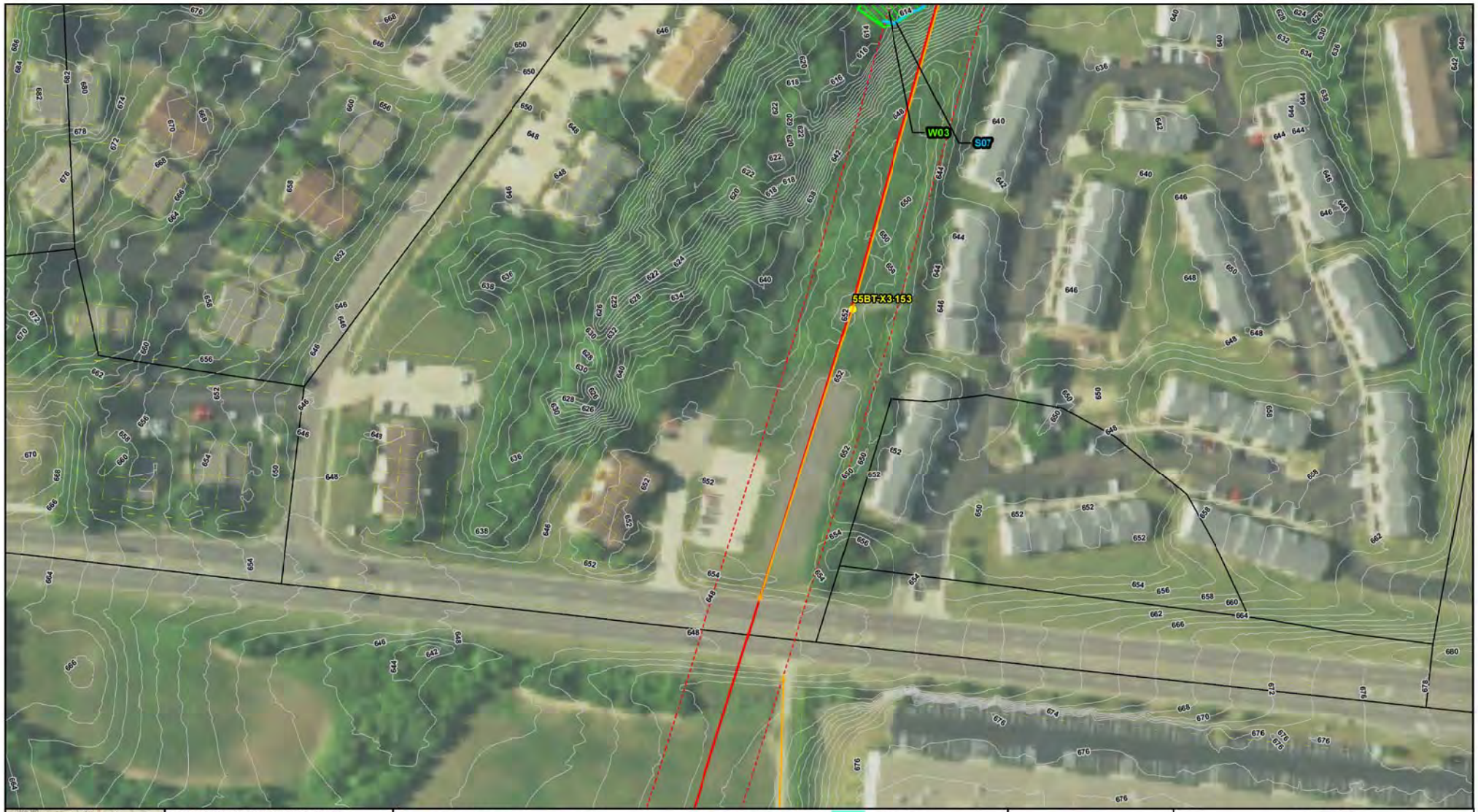

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

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FIGURE 4.09
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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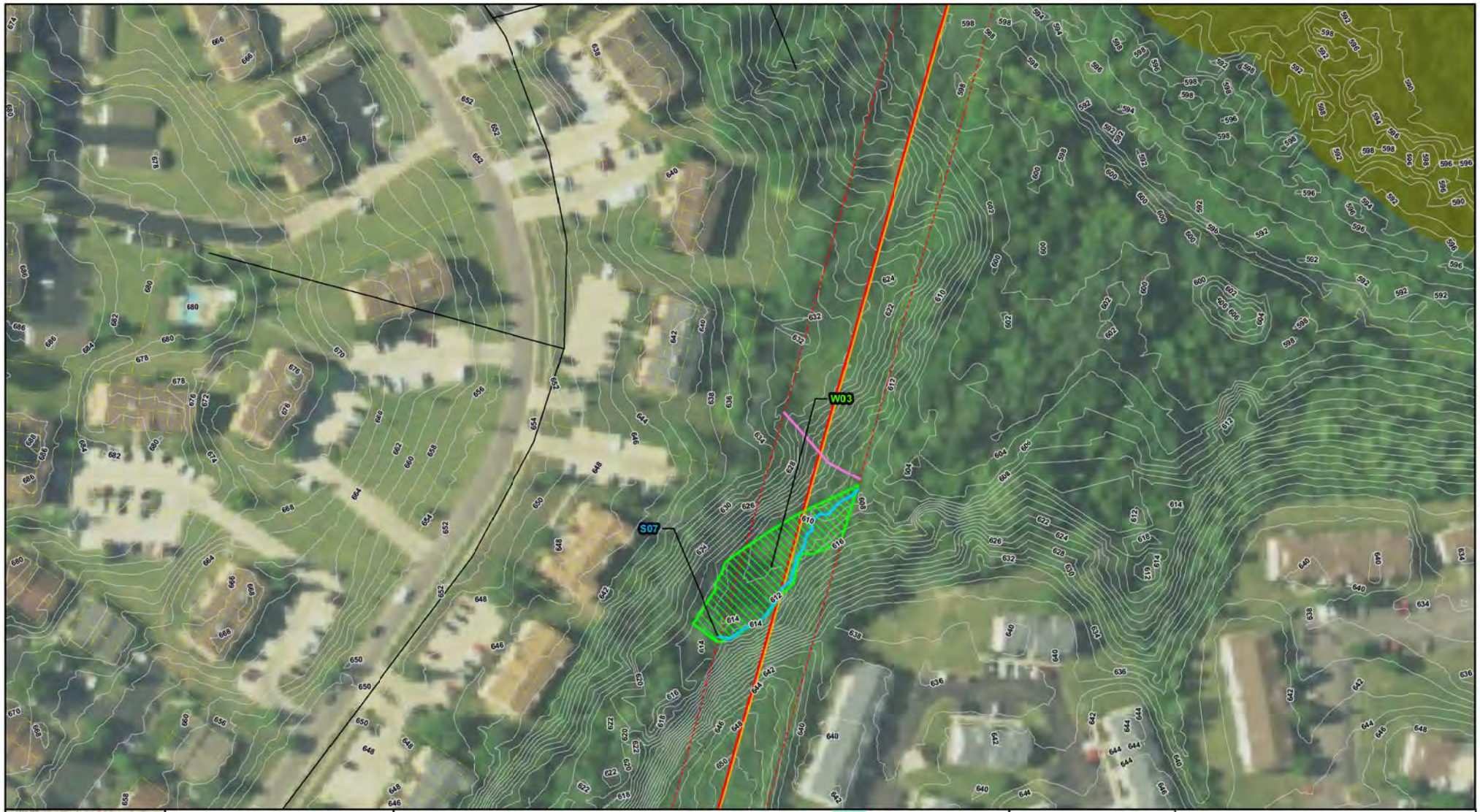

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.10
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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DATE: 10/17/2019
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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

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FIGURE 4.11
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

Alternate Access	Ditch	Potential Access	Floodway
Existing Facility	NHD Flowline	Project Centerline	100-year Floodplain
Existing Structure	2-ft Contours	100-ft Corridor	Delineated Wetland
Culvert	Fence Line	Municipal Boundary	Delineated Pond
Stormwater Inlet	Delineated Stream	Parcels	NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.12
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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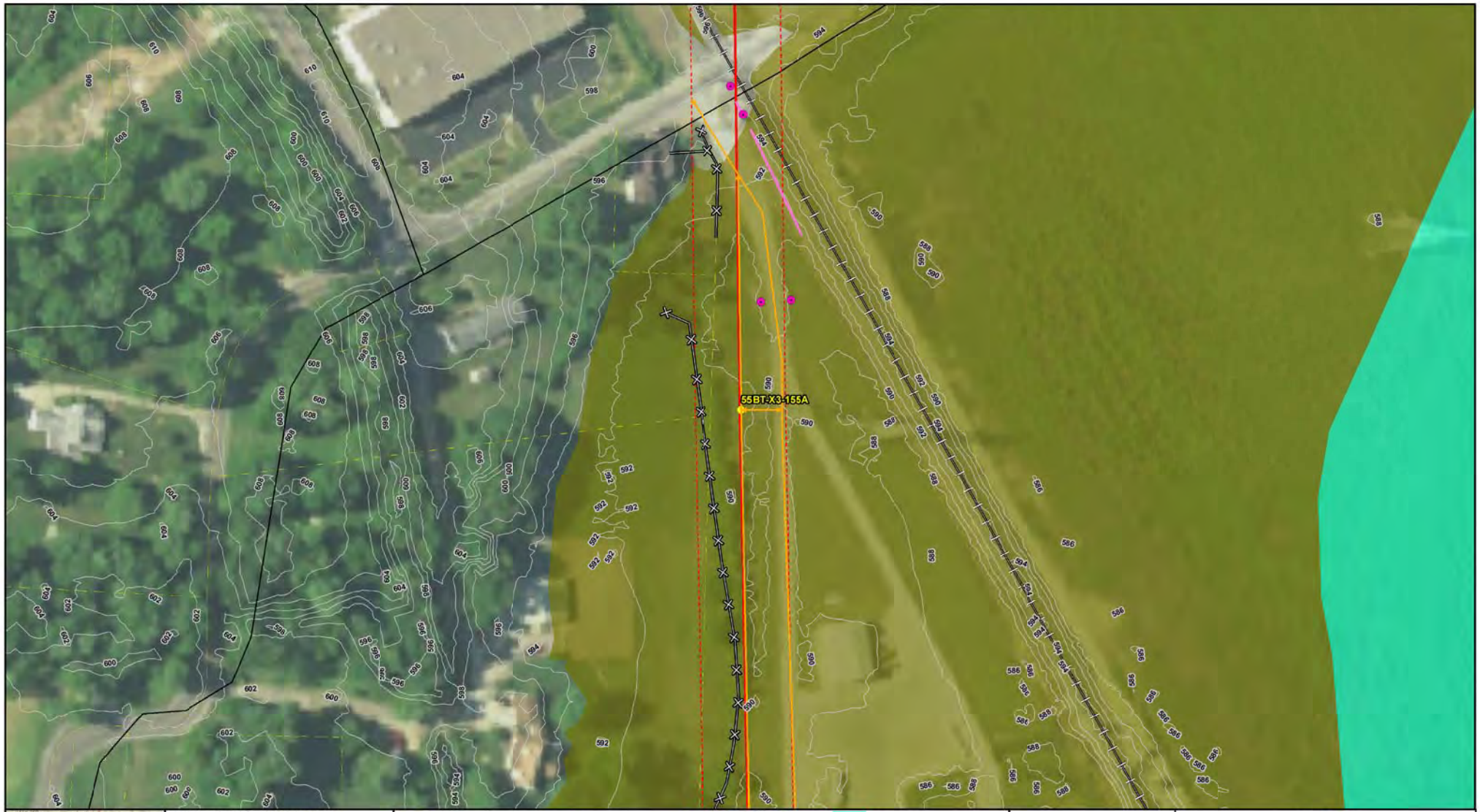

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIAESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY

Cardno

FIGURE 4.13
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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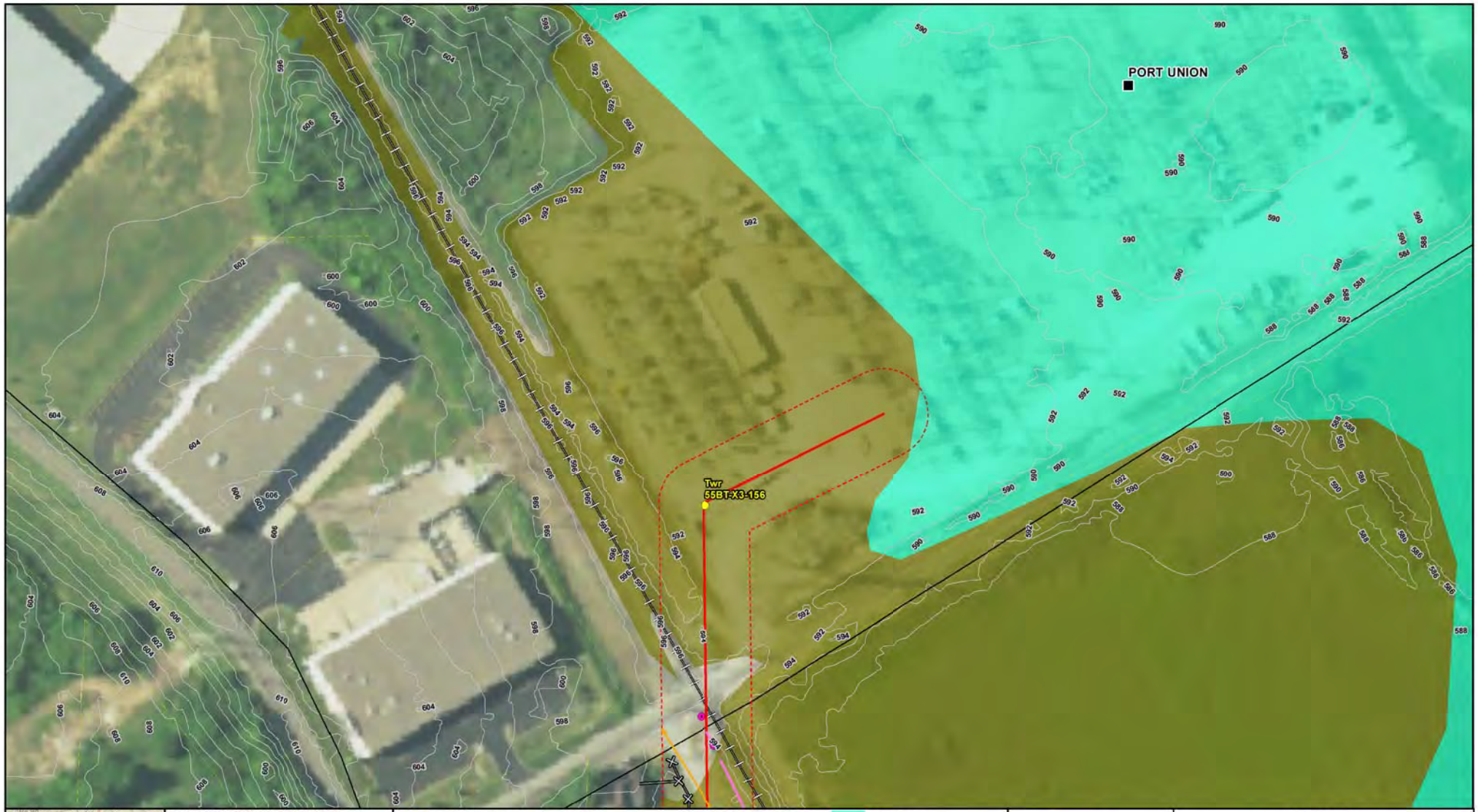

PROJECT LOCATION

BUTLER COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: GLENDALE, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

- Alternate Access
- Existing Facility
- Existing Structure
- Culvert
- Stormwater Inlet
- Ditch
- NHD Flowline
- 2-ft Contours
- Fence Line
- Delineated Stream
- Potential Access
- Project Centerline
- 100-ft Corridor
- Municipal Boundary
- Parcels
- Floodway
- 100-year Floodplain
- Delineated Wetland
- Delineated Pond
- NWI Wetlands

DUKE ENERGY.

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FIGURE 4.14
IDENTIFIED FEATURES MAP

F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
REGULATED WATERS DELINEATION REPORT

DUKE ENERGY OHIO

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DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

APPENDIX

A

SITE PHOTOGRAPHS

Photo 1: Stream 1, View Facing Upstream, 08/13/2019.

Photo 2: Stream 2, View Facing Upstream, 08/13/2019.

Photo 3: Stream 3, View Facing Upstream, 08/13/2019.

Photo 4: Stream 4, View Facing Upstream, 08/13/2019.

Photo 5: Stream 5, View Facing Upstream, 08/14/2019.

Photo 6: Stream 6, View Facing Upstream, 08/14/2019.

Photo 7: Stream 7, View Facing Upstream, 08/13/2019.

Photo 8: Stream 8, View Facing Upstream, 08/13/2019.

Photo 9: Overview of Wetland 1, View Facing South, 08/13/2019.

Photo 10: Overview of Wetland 2, View Facing North, 08/13/2019.

Photo 11: Overview of Wetland 3, View Facing South, 08/14/2019.

Photo 12: Overview of Wetland 4, View Facing South, 08/14/2019.

DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

APPENDIX

B

WETLAND DELINEATION DATA
SHEETS – MIDWEST

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: F3886 Port Union to Mulhauser Rebuild Project | City/County: Fairfield/Butler | Sampling Date: 8/13/2019

Applicant/Owner: Duke Energy Ohio | State: OH | Sampling Point: DP01

Investigator(s): Cori Jansing and Kaitlin Hillier | Section, Township, Range: S8, T2E, R2N

Landform (hillslope, terrace, etc.): Stream Terrace | Local relief (concave, convex, none): concave

Slope (%): 0% | Lat: 39.309258 | Long: -84.482372 | Datum: NAD83 UTM16N

Soil Map Unit Name: Henshaw silt loam, 0 to 2 percent slopes (HoA) | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Scirpus atrovirens*	55%	Yes	OBL
2. *Carex vulpinoidea*	20%	Yes	FACW
3. *Carex frankii*	15%	No	OBL
4. *Symphyotrichum lanceolatum*	15%	No	FAC
5. *Eleocharis obtusa*	10%	No	OBL
6. *Vernonia gigantea*	5%	No	FAC
7. *Cyperus esculentus*	5%	No	FACW
8. *Persicaria maculosa*	5%	No	FACW
9. *Dipsacus fullonum*	5%	No	FACU
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	135%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	A/B
That Are OBL, FACW, or FAC:			
OBL species	80%	x1 =	0.8
FACW species	30%	x2 =	0.6
FAC species	20%	x3 =	0.6
FACU species	5%	x4 =	0.2
UPL species		x5 =	
Column Totals:	1.35 (A)		2.2 (B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

X 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 3-Prevalence Index is ≤3.0[1]

____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 4/2	100					Silty Clay Loam	
3-16"	10YR 5/4	95	10YR 5/6	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States*, Version 8.0, 2016.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches):	2"
Water Table Present?	Yes ___ No X	Depth (inches):	N/A
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOIL

Sampling Point: DP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR 4/2	100					Silty Clay Loam	
8-16"	10YR 5/3	98	10YR 4/6	2	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Test Indicators of Hydric Soils:

___ Iron-Manganese Masses (F12)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States*, Version 8.0, 2016.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): N/A
Water Table Present? Yes ___ No X Depth (inches): N/A
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): N/A

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOIL

Sampling Point: DP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 3/1	95	10YR 3/6	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States*, Version 8.0, 2016.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	N/A
Water Table Present?	Yes ___ No X	Depth (inches):	N/A
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	2"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: F3886 Port Union to Mulhauser Rebuild Project | City/County: West Chester Township/Butler | Sampling Date: 8/13/2019

Applicant/Owner: Duke Energy Ohio | State: OH | Sampling Point: DP04

Investigator(s): Cori Jansing and Kaitlin Hillier | Section, Township, Range: S8, T2E, R2N

Landform (hillslope, terrace, etc.): Shoulder | Local relief (concave, convex, none): none

Slope (%): 0% | Lat: 39.30933 | Long: -84.479029 | Datum: NAD83 UTM16N

Soil Map Unit Name: Udorthents (Ud) | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	Yes ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Festuca rubra*	65%	Yes	FACU
2. *Sorghum halepense*	30%	Yes	FACU
3. *Trifolium pratense*	20%	No	FACU
4. *Dipsacus fullonum*	5%	No	FACU
5. *Cirsium arvense*	5%	No	FACU
6. *Erigeron annuus*	5%	No	FACU
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	130%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
That Are OBL, FACW, or FAC:			A/B
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species	130%	x4 =	5.2
UPL species		x5 =	
Column Totals:	1.30 (A)		5.2 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

____ 2-Dominance Test is >50%

____ 3-Prevalence Index is ≤3.0[1]

____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: F3886 Port Union to Mulhauser Rebuild Project | City/County: Fairfield/Butler | Sampling Date: 8/14/2019

Applicant/Owner: Duke Energy Ohio | State: OH | Sampling Point: DP05

Investigator(s): Cori Jansing and Kaitlin Hillier | Section, Township, Range: S3, T2E, R2N

Landform (hillslope, terrace, etc.): Stream Terrace | Local relief (concave, convex, none): concave

Slope (%): 0% | Lat: 39.31874 | Long: -84.452418 | Datum: NAD83 UTM16N

Soil Map Unit Name: Eden silty clay loam, 25 to 50 percent slopes, moderately eroded (EcF2) | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Salix nigra*	30%	Yes	OBL
2. *Fraxinus pennsylvanica*	5%	No	FACW
3.			
4.			
5.			
	35% = Total Cover		

Herb Stratum (Plot size: 5' radius)			
1. *Typha latifolia*	75%	Yes	OBL
2. *Phalaris arundinacea*	30%	Yes	FACW
3. *Impatiens capensis*	20%	No	FACW
4. *Scirpus atrovirens*	20%	No	OBL
5. *Ageratina altissima*	5%	No	FACU
6. *Juncus torreyi*	5%	No	FACW
7. *Vernonia gigantea*	5%	No	FAC
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	160% = Total Cover		

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	A/B
OBL species	125%	x1 =	1.25
FACW species	60%	x2 =	1.2
FAC species	5%	x3 =	0.15
FACU species	5%	x4 =	0.2
UPL species		x5 =	
Column Totals:	1.95 (A)		2.8 (B)

Prevalence Index = B/A = 1.44

Hydrophytic Vegetation Indicators:

- X 1-Rapid Test for Hydrophytic Vegetation
- X 2-Dominance Test is >50%
- X 3-Prevalence Index is ≤3.0[1]
- ____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: F3886 Port Union to Mulhauser Rebuild Project | City/County: Fairfield/Butler | Sampling Date: 8/14/2019

Applicant/Owner: Duke Energy Ohio | State: OH | Sampling Point: DP06

Investigator(s): Cori Jansing and Kaitlin Hillier | Section, Township, Range: S3, T2E, R2N

Landform (hillslope, terrace, etc.): Backslope | Local relief (concave, convex, none): convex

Slope (%): 5% | Lat: 39.318755 | Long: -84.452458 | Datum: NAD83 UTM16N

Soil Map Unit Name: Eden silty clay loam, 25 to 50 percent slopes, moderately eroded (EcF2) | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	Yes ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Lonicera maackii*	5%	Yes	UPL
2.			
3.			
4.			
5.			
	5%	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Lonicera maackii*	20%	Yes	UPL
2. *Solidago canadensis*	3%	No	FACU
3. *Impatiens capensis*	3%	No	FACW
4. *Carex blanda*	3%	No	FAC
5. *Lonicera japonica*	3%	No	FACU
6. *Vitis aestivalis*	3%	No	FACU
7. *Packera glabella*	1%	No	FACW
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	36%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
That Are OBL, FACW, or FAC:			A/B
OBL species		x1 =	
FACW species	4%	x2 =	0.08
FAC species	3%	x3 =	0.09
FACU species	9%	x4 =	0.36
UPL species	25%	x5 =	1.25
Column Totals:	0.41 (A)		1.78 (B)

Prevalence Index = B/A = 4.34

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation
____ 2-Dominance Test is >50%
____ 3-Prevalence Index is ≤3.0[1]
____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Recently maintained ROW

SOIL

Sampling Point: DP07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 3/1	90	10YR 4/6	10	C	M	Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States*, Version 8.0, 2016.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	N/A
Water Table Present?	Yes ___ No X	Depth (inches):	N/A
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: F3886 Port Union to Mulhauser Rebuild Project | City/County: Fairfield/Butler | Sampling Date: 8/14/2019

Applicant/Owner: Duke Energy Ohio | State: OH | Sampling Point: DP08

Investigator(s): Cori Jansing and Kaitlin Hillier | Section, Township, Range: S3, T2E, R2N

Landform (hillslope, terrace, etc.): Summit | Local relief (concave, convex, none): concave

Slope (%): 1% | Lat: 39.323269 | Long: -84.450521 | Datum: NAD83 UTM16N

Soil Map Unit Name: Patton silty clay loam, 0 to 2 percent slopes (Pa) | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	Yes ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Solidago canadensis*	75%	Yes	FACU
2. *Vernonia gigantea*	20%	Yes	FAC
3. *Ambrosia artemisiifolia*	10%	No	FACU
4. *Eupatorium serotinum*	10%	No	FAC
5. *Dipsacus fullonum*	10%	No	FACU
6. *Setaria faberi*	10%	No	FACU
7. *Melilotus officinalis*	5%	No	FACU
8. *Parthenocissus quinquefolia*	5%	No	FACU
9. *Rubus allegheniensis*	5%	No	FACU
10. *Apocynum cannabinum*	5%	No	FAC
11. *Bidens frondosa*	5%	No	FACW
12. *Geum canadense*	5%	No	FAC
13. *Impatiens capensis*	5%	No	FACW
14. *Rumex crispus*	5%	No	FAC
15. *Verbena urticifolia*	5%	No	FAC
16.			
17.			
18.			
19.			
20.			
	180%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	A/B
OBL species		x1 =	
FACW species	10%	x2 =	0.2
FAC species	50%	x3 =	1.5
FACU species	120%	x4 =	4.8
UPL species		x5 =	
Column Totals:	1.80 (A)		6.5 (B)

Prevalence Index = B/A = 3.61

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

____ 2-Dominance Test is >50%

____ 3-Prevalence Index is ≤3.0[1]

____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

APPENDIX

C

OHIO RAPID ASSESSMENT METHOD 5.0 FORMS

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

Project: F3886 Port Union to Mulhauser ReBuild Project

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [X] <0.1 acres (0.04ha) (0 pts)

1	1
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1
- [X] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0

2b. Intensity of surrounding land use. Select one or double check and average

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7
- [ ] LOW. Old field (>10 years), shrubland, young second growth forest. (5
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1

16	17
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

[X]	ditch	[ ]	point source (nonstormwater)
[ ]	tile	[ ]	filling/grading
[ ]	dike	[ ]	road bed/RR track
[ ]	weir	[ ]	dredging
[X]	stormwater input	[ ]	other

6.5	24
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average

- [ ] None or none apparent (4)
- [X] Recovered (3)
- [X] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [X] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

[X]	mowing	[ ]	shrub/sapling removal
[ ]	grazing	[ ]	herbaceous/aquatic bed removal
[ ]	clearcutting	[ ]	sedimentation
[ ]	selective cutting	[ ]	dredging
[ ]	woody debris removal	[ ]	farming
[ ]	toxic pollutants	[ ]	nutrient enrichment

24
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

2
subtotal this page

Site: F3886 Port Union to Mulhauser ReBuild Project

0	0
max 10 pts	subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10
- [ ] Significant migratory songbird/water fowl habitat or usage (10
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10
- [X] Not Applicable (0)

2	2
max 20 pts	subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [1] Emergent
- [0] Shrub
- [0] Forest
- [0] Mudflats
- [0] Open water
- [0] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [X] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [X] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummocks/tussocks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a smal part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but no always the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

26	Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

Project: F3886 Port Union to Mulhauser ReBuild Project

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

5	7
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0

2b. Intensity of surrounding land use. Select one or double check and average

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7
- [X] LOW. Old field (>10 years), shrubland, young second growth forest. (5
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1

20	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

13	40
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [X] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

40
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

8 subtotal this page

Site: F3886 Port Union to Mulhauser ReBuild Project

0 | 0 max 10 pt: subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10
- [ ] Significant migratory songbird/water fowl habitat or usage (10
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10
- [X] Not Applicable (0)

8 | 8 max 20 pt: subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [2] Emergent
- [2] Shrub
- [1] Forest
- [0] Mudflats
- [0] Open water
- [0] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummocks/tussocks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [1] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a smal part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but no always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

48 Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

Project: F3886 Port Union to Mulhauser ReBuild Project

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

5	7
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0

2b. Intensity of surrounding land use. Select one or double check and average

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7
- [X] LOW. Old field (>10 years), shrubland, young second growth forest. (5
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1

20	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [X] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

12	39
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [X] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

39
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

6
subtotal this page

Site: F3886 Port Union to Mulhauser ReBuild Project

0 | 0
max 10 pts | subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10
- [ ] Significant migratory songbird/water fowl habitat or usage (10
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10
- [X] Not Applicable (0)

6 | 6
max 20 pts | subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [2] Emergent
- [2] Shrub
- [0] Forest
- [0] Mudflats
- [0] Open water
- [0] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummocks/tussocks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [1] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
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Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but no always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

45 Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

Project: F3886 Port Union to Mulhauser ReBuild Project

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

5	7
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0

2b. Intensity of surrounding land use. Select one or double check and average

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7
- [ ] LOW. Old field (>10 years), shrubland, young second growth forest. (5
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3
- [X] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1

17	24
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [X] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

13	37
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [X] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average

- [ ] None or none apparent (9)
- [X] Recovered (6)
- [X] Recovering (3)
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Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

37
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Duke Energy Ohio	Rater(s): C Jansing & K Hillier	Date: August 13, 2019

10 subtotal this page

Site: F3886 Port Union to Mulhauser ReBuild Project

0 max 10 pts | 0 subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5
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- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10
- [ ] Significant migratory songbird/water fowl habitat or usage (10
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10
- [X] Not Applicable (0)

10 max 20 pts | 10 subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [0] Aquatic bed
- [2] Emergent
- [2] Shrub
- [1] Forest
- [0] Mudflats
- [0] Open water
- [0] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [X] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [2] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [1] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
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Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

47 Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

APPENDIX

D

OHIO HHEI DATA SHEETS

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 53

SITE NAME/LOCATION: S01 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi²): <1
LENGTH OF STREAM REACH (ft): 200 | LAT: 39.309121 | LONG: -84.481696 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [X] NONE / NATURAL CHANNEL [ ] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	30
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	5
[ ] GRAVEL (2-64mm) **[9 pts]**	20	[ ] MUCK **[0 PT]**	
[X] SAND (<2mm) **[6 pts]**	45	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A)

SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 9

TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 13 (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [X] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [ ] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 30

Pool Depth Max = 30: 20

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: channelized | **AVERAGE BANKFULL WIDTH (meters)** 1.8

Bankfull Width Max = 30: 20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)
[ ]	[ ]	Wide >10m
[ ]	[ ]	Moderate 5-10m
[X]	[X]	Narrow <5m
[ ]	[ ]	None

L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)
[ ]	[ ]	Mature Forest, Wetland
[ ]	[ ]	Immature Forest, Shrub, or Old Field
[ ]	[ ]	Residential, Park, New Field
[ ]	[ ]	Fenced Pasture

L	R	
[ ]	[ ]	Conservation Tillage
[X]	[X]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [X] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [ ] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments: Fish Observed

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[ ] Flat (0.5ft/100ft) [X] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

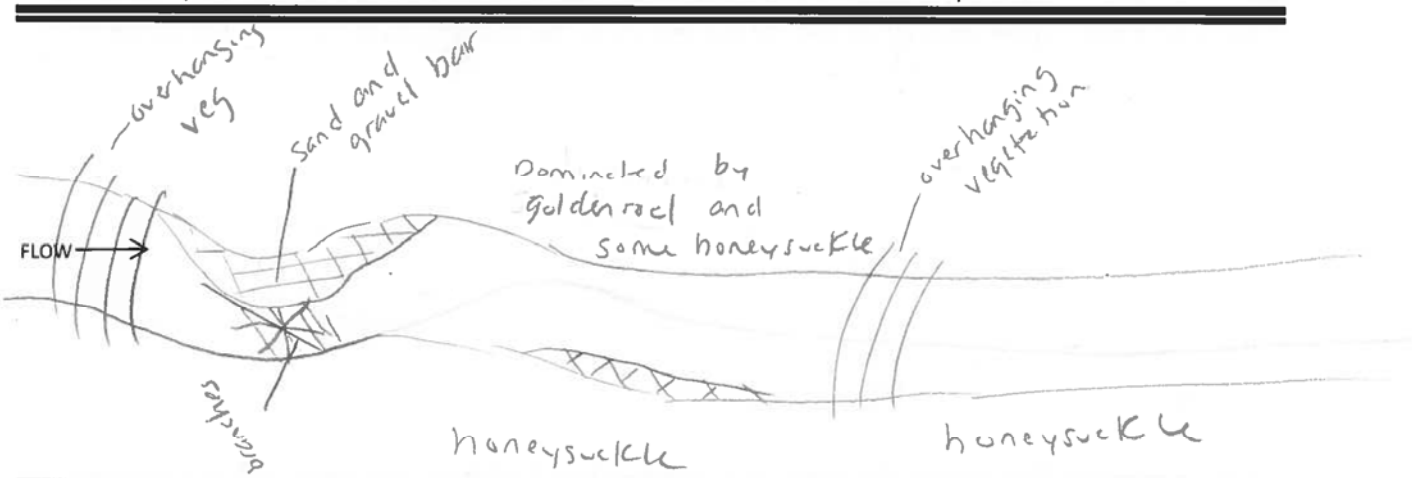
Fish observed? (Y/N) Y Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) Y Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 66

SITE NAME/LOCATION: S02 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 54 | LAT: 39.31022 | LONG: -84.467936 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [ ] RECOVERED [ ] RECOVERING [X] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40).
Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	50
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	5
[X] GRAVEL (2-64mm) **[9 pts]**	25	[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**	20	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A) → **SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES:** 12
TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 16 — A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [X] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [ ] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 3.0

Bankfull Width Max = 30: 25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH (Per Bank) L	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	L	R		L	R
[ ]	[ ]	Wide >10m	[ ]	[ ]	Mature Forest, Wetland		[ ]	[ ]
[ ]	[ ]	Moderate 5-10m	[ ]	[ ]	Immature Forest, Shrub, or Old Field		[ ]	[ ]
[X]	[X]	Narrow <5m	[ ]	[ ]	Residential, Park, New Field		[ ]	[ ]
[ ]	[ ]	None	[ ]	[ ]	Fenced Pasture		[X]	[X]
						Conservation Tillage		
						Urban or Industrial		
						Open Pasture, Row Crop		
						Mining or Construction		

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[ ] Flat (0.5ft/100ft) [X] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

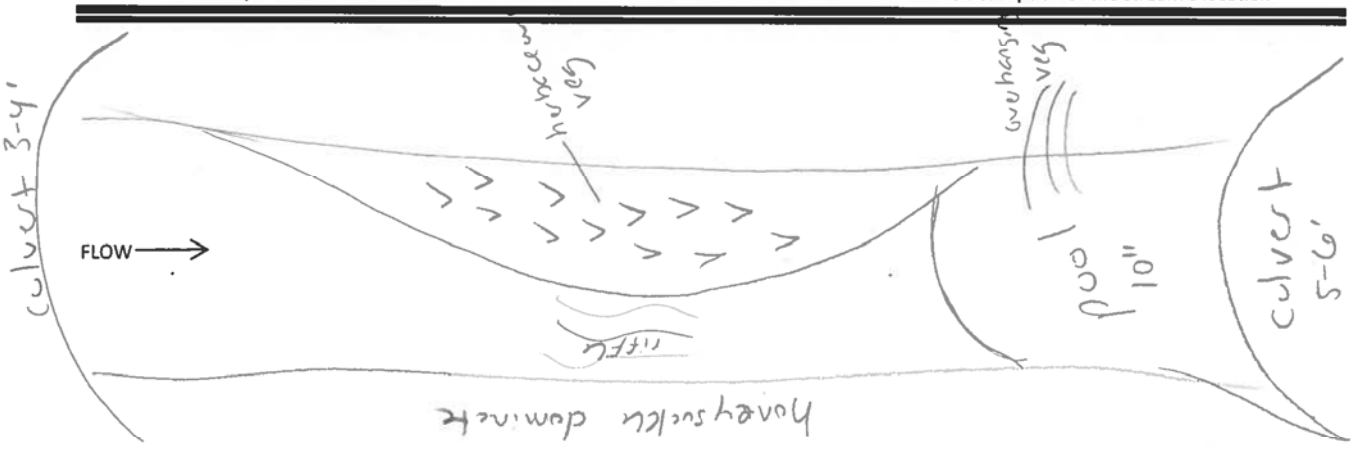
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 58

SITE NAME/LOCATION: S03 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi²): <1
LENGTH OF STREAM REACH (ft): 78 | LAT: 39.31095 | LONG: -84.462257 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C Jansing & K Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [X] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40).
Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	35
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**	5	[ ] CLAY or HARDPAN **[0 PT]**	
[ ] GRAVEL (2-64mm) **[9 pts]**	25	[ ] MUCK **[0 PT]**	
[X] SAND (<2mm) **[6 pts]**	35	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 5 (A) → 9
SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES:
TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 13 (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 1.5

Bankfull Width Max = 30: 20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH (Per Bank) L	L	R
Wide >10m	[ ]	[ ]
Moderate 5-10m	[ ]	[ ]
Narrow <5m	[X]	[X]
None	[ ]	[ ]

FLOODPLAIN QUALITY (Most Predominant per Bank) L	L	R
Mature Forest, Wetland	[ ]	[ ]
Immature Forest, Shrub, or Old Field	[ ]	[ ]
Residential, Park, New Field	[ ]	[ ]
Fenced Pasture	[ ]	[ ]

L	R	
[ ]	[ ]	Conservation Tillage
[X]	[X]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [X] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [ ] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

- [ ] Flat (0.5ft/100ft)
- [X] Flat to Moderate
- [ ] Moderate (2ft/100ft)
- [ ] Moderate to Severe
- [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

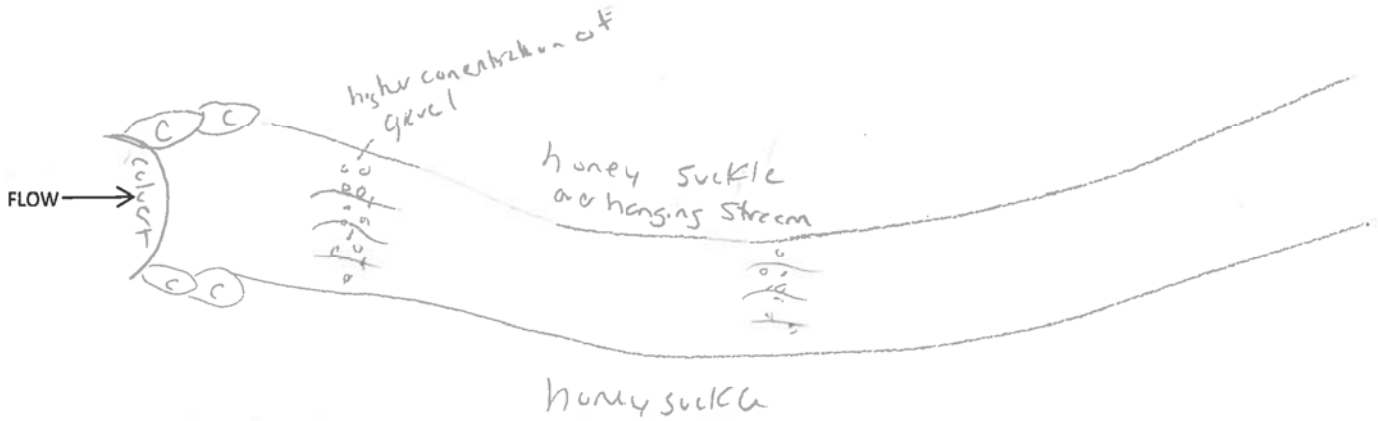
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 51

SITE NAME/LOCATION: S04 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi²): <1
LENGTH OF STREAM REACH (ft): 200 | LAT: 39.311768 | LONG: -84.459896 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [X] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40).
Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	50
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	
[X] GRAVEL (2-64mm) **[9 pts]**	30	[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**	10	[ ] ARTIFICIAL **[3 PTS]**	10

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A)
SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 12
TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points
Substrate Max = 40: 16
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [ ] >10 - 22.5 cm **[25 pts]**
- [X] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 5

Pool Depth Max = 30: 15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 2.1

Bankfull Width Max = 30: 20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)
[ ]	[ ]	Wide >10m
[ ]	[ ]	Moderate 5-10m
[X]	[X]	Narrow <5m
[ ]	[ ]	None

L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)
[ ]	[ ]	Mature Forest, Wetland
[ ]	[ ]	Immature Forest, Shrub, or Old Field
[ ]	[ ]	Residential, Park, New Field
[ ]	[ ]	Fenced Pasture

L	R	
[ ]	[ ]	Conservation Tillage
[X]	[X]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [ ] None
- [X] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[X] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

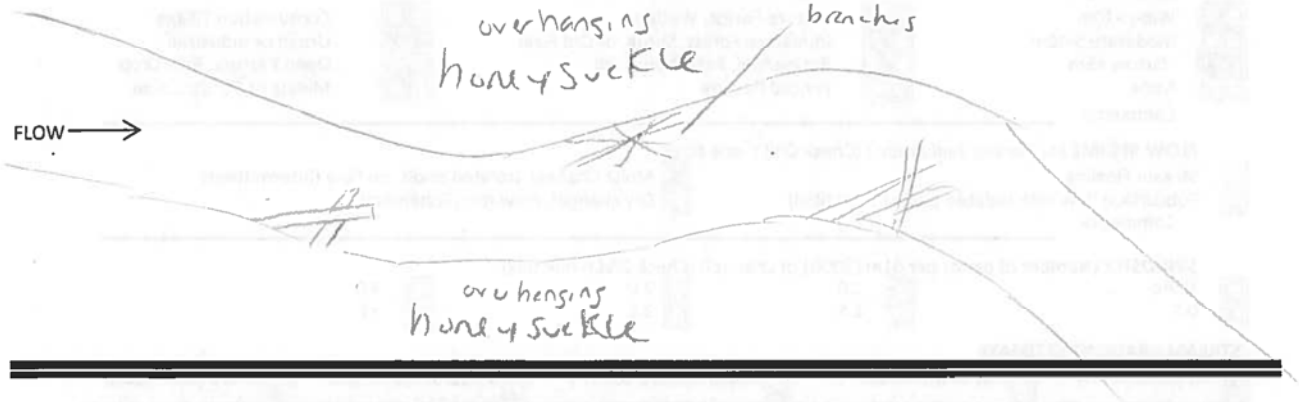
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 61

SITE NAME/LOCATION: S05 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi²): <1
LENGTH OF STREAM REACH (ft): 200 | LAT: 39.312659 | LONG: -84.457544 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [ ] RECOVERED [ ] RECOVERING [X] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	30
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	5
[X] GRAVEL (2-64mm) **[9 pts]**	45	[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**	20	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A) → 12

SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 12 **TOTAL NUMBER OF SUBSTRATE TYPES:** 4 (B)

HHEI Metric Points — Substrate Max = 40: 16 (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: **AVERAGE BANKFULL WIDTH (meters):** 2.7

Bankfull Width Max = 30: 20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)
[ ]	[ ]	Wide >10m
[ ]	[ ]	Moderate 5-10m
[X]	[X]	Narrow <5m
[ ]	[ ]	None

L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)
[ ]	[ ]	Mature Forest, Wetland
[ ]	[ ]	Immature Forest, Shrub, or Old Field
[ ]	[ ]	Residential, Park, New Field
[ ]	[ ]	Fenced Pasture

L	R	
[ ]	[ ]	Conservation Tillage
[X]	[X]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[X] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score ____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: ____ Distance from Evaluated Stream ____

☐ CWH Name: ____ Distance from Evaluated Stream ____

☐ EWH Name: ____ Distance from Evaluated Stream ____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: ____ NRCS Soil Map Page: ____ NRCS Soil Map Stream Order ____

County: ____ Township/City: ____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: ____ Quantity: ____

Photographer Information: ____

Elevated Turbidity? (Y/N): N Canopy (% open): ____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number ____

Field Measures: Temp (°C) ____ Dissolved Oxygen (mg/l) ____ pH (S.U.) ____ Conductivity (µmhos/cm) ____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: ____

Additional comments/description of pollution impacts ____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

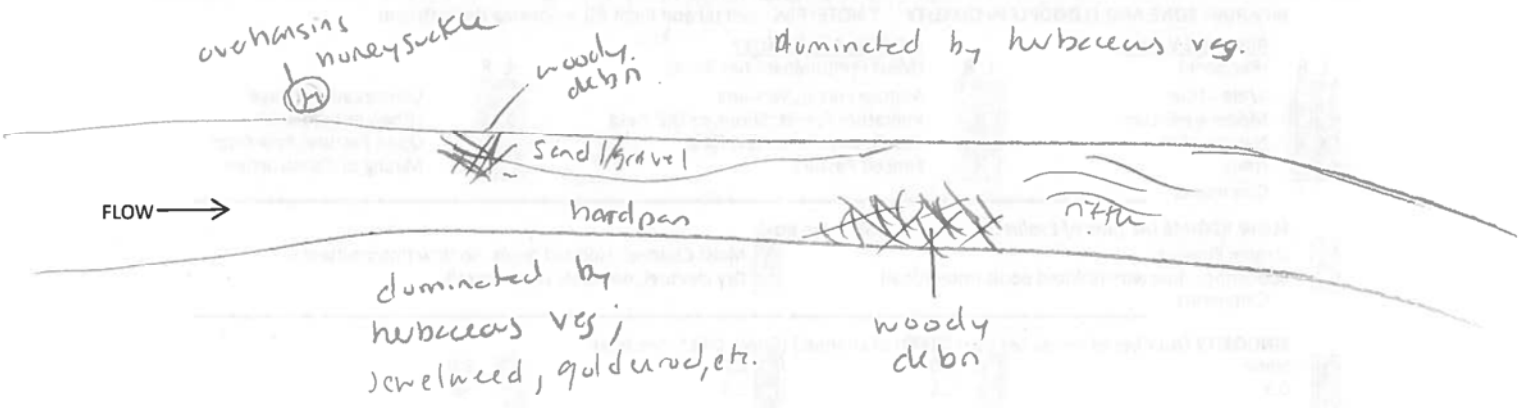
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology ____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 69

SITE NAME/LOCATION: S06 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi²): <1
LENGTH OF STREAM REACH (ft): 165 | LAT: 39.31352 | LONG: -84.455033 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [X] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40).
Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[ ] SILT **[3 PTS]**	25
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	10
[X] GRAVEL (2-64mm) **[9 pts]**	30	[ ] MUCK **[0 PT]**	
[X] SAND (<2mm) **[6 pts]**	35	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A) → **SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES:** 15
TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points
Substrate Max = 40: 19
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [X] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [ ] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 3.4

Bankfull Width Max = 30: 25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)
[ ]	[ ]	Wide >10m
[ ]	[ ]	Moderate 5-10m
[X]	[X]	Narrow <5m
[ ]	[ ]	None

L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)
[ ]	[ ]	Mature Forest, Wetland
[ ]	[ ]	Immature Forest, Shrub, or Old Field
[ ]	[ ]	Residential, Park, New Field
[ ]	[ ]	Fenced Pasture

L	R	
[ ]	[ ]	Conservation Tillage
[X]	[X]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[X] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score ____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: ____ Distance from Evaluated Stream ____

☐ CWH Name: ____ Distance from Evaluated Stream ____

☐ EWH Name: ____ Distance from Evaluated Stream ____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: ____ NRCS Soil Map Page: ____ NRCS Soil Map Stream Order ____

County: ____ Township/City: ____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: ____ Quantity: ____

Photographer Information: ____

Elevated Turbidity? (Y/N): N Canopy (% open): ____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number ____

Field Measures: Temp (°C) ____ Dissolved Oxygen (mg/l) ____ pH (S.U.) ____ Conductivity (µmhos/cm) ____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: ____

Additional comments/description of pollution impacts ____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

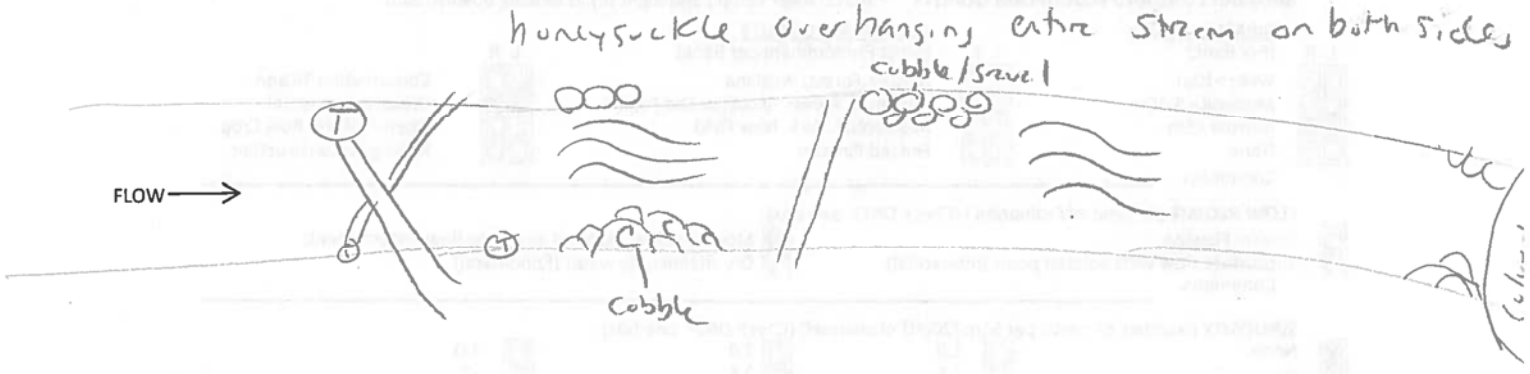
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology ____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 54

SITE NAME/LOCATION: S07 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 200 | LAT: 39.318736 | LONG: -84.452170 | RIVER CODE: | RIVER MILE:
DATE: 8/14/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [ ] RECOVERED [X] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[ ] SILT **[3 PTS]**	
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[X] CLAY or HARDPAN **[0 PT]**	80
[ ] GRAVEL (2-64mm) **[9 pts]**	5	[ ] MUCK **[0 PT]**	
[X] SAND (<2mm) **[6 pts]**	15	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A)

SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 6

TOTAL NUMBER OF SUBSTRATE TYPES: 3 (B)

HHEI Metric Points
Substrate Max = 40
9
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30
25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 1.5

Bankfull Width Max = 30
20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
[ ]	[ ]	Wide >10m	[ ]	[ ]	Mature Forest, Wetland	[ ]	[ ]	Conservation Tillage
[ ]	[ ]	Moderate 5-10m	[ ]	[ ]	Immature Forest, Shrub, or Old Field	[ ]	[ ]	Urban or Industrial
[X]	[X]	Narrow <5m	[X]	[X]	Residential, Park, New Field	[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	None	[ ]	[ ]	Fenced Pasture	[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [ ] None
- [X] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[ ] Flat (0.5ft/100ft) [X] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

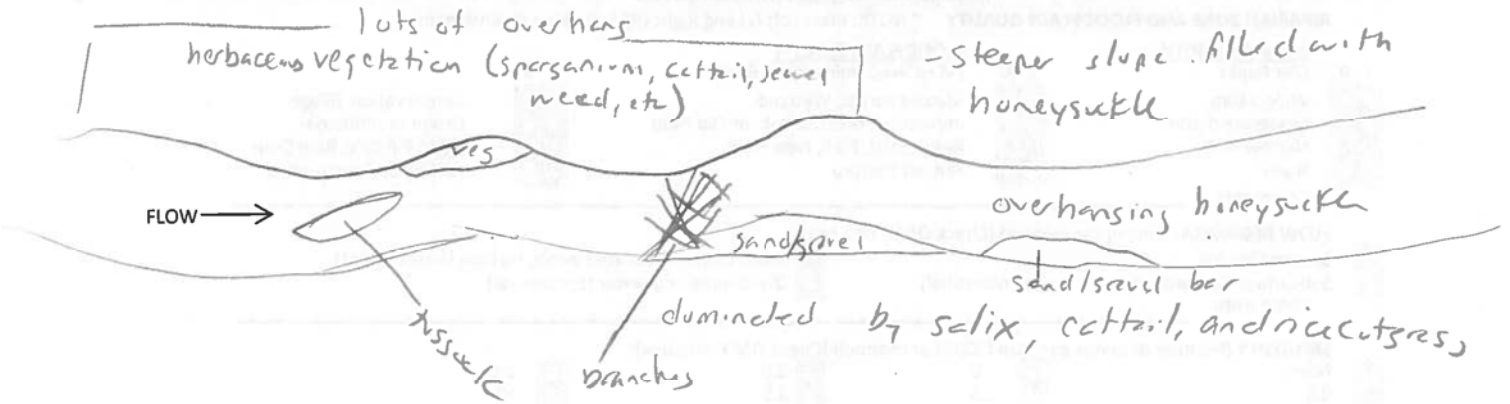
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 63

SITE NAME/LOCATION: S08 Duke Energy Ohio F3886 Port Union to Mulhauser Rebuild
SITE NUMBER: | RIVER BASIN: East Fork Mill Creek-Mill Creek | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 200 | LAT: 39.321012 | LONG: -84.451337 | RIVER CODE: | RIVER MILE:
DATE: 8/13/2019 | SCORER: C. Jansing & K. Hillier | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [X] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40).
Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	95
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	5
[ ] GRAVEL (2-64mm) **[9 pts]**		[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**		[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 0 (A)
SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 6
TOTAL NUMBER OF SUBSTRATE TYPES: 2 (B)

HHEI Metric Points
Substrate Max = 40
8
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 15

Pool Depth Max = 30
25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [X] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [ ] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 4.6

Bankfull Width Max = 30
30

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R
[X]	[X] Wide >10m	[X]	[X] Mature Forest, Wetland		[ ]	[ ] Conservation Tillage
[ ]	[ ] Moderate 5-10m	[ ]	[ ] Immature Forest, Shrub, or Old Field		[ ]	[ ] Urban or Industrial
[ ]	[ ] Narrow <5m	[ ]	[ ] Residential, Park, New Field		[ ]	[ ] Open Pasture, Row Crop
[ ]	[ ] None	[ ]	[ ] Fenced Pasture		[ ]	[ ] Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [X] None
- [ ] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[X] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: _____ Quantity: _____

Photographer Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): _____

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream? (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

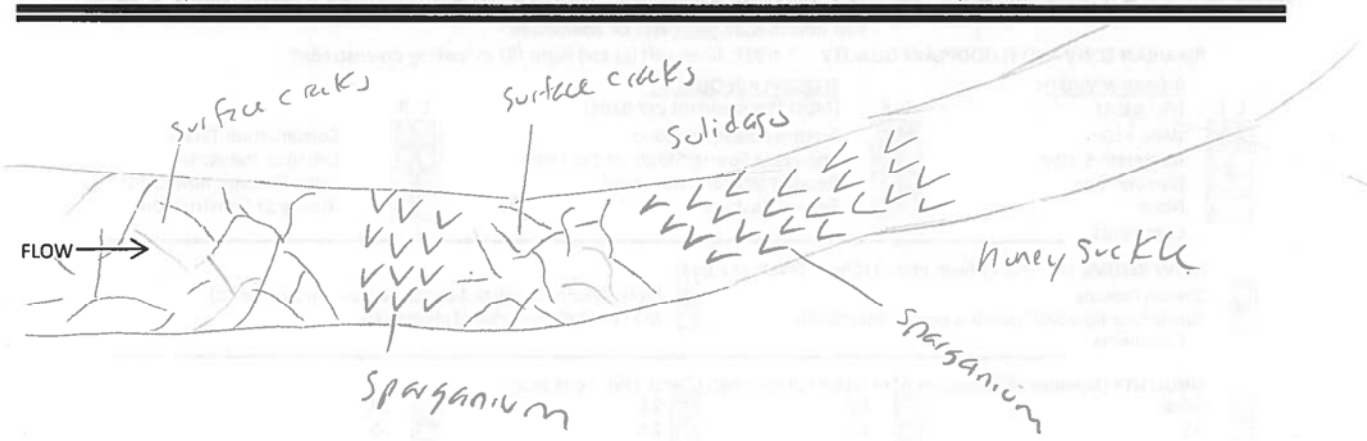
Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location



DUKE ENERGY OHIO
F3886 PORT UNION TO MUHLHAUSER
REBUILD PROJECT
WETLAND DELINEATION REPORT

APPENDIX

E

ENDANGERED, THREATENED, AND RARE SPECIES CORRESPONDENCE

SPECIES	COMMON NAME	STATE STATUS [1]	FEDERAL STATUS[2]	HABITAT[3]	BREEDING PERIOD[3]	PROBABILITY OF OCCURENCE[4]
Butler County						
MAMMAL						
Eptesicus fuscus	Big Brown Bat	SSC	---	Water, fields, forest openings, and urban and suburban areas.	August-October	Low
Lasionycteris noctivagans	Silver-Haired Bat	SCC	---	Prefer mature northern forests with ponds and streams nearby. It roosts in trees during the summer and winter.	August-October	Low
Lasiurus borealis	Red Bat	SSC	---	Solitary and prefer to roost in trees, shrubs, and clusters of weeds in the summer. They change roost sites every couple of days and often roost closer to the ground. They overwinter in trees and tree cavities.	August-October	Low
Lasiurus cinereus	Hoary Bat	SSC	---	Migratory tree bat species travel north in the summer and back south in the winter. They migrate varying distances using landmarks and magnetic cues to direct themselves, and instead of hibernating in caves, they often hibernate in trees or leaf litter.	August-October	Low
Microtus ochrogaster	Prairie Vole	SSC	---	Eastern deciduous forests. They live on the forest floor in the thick layers of leaves and loose soil.	April-October	Low
Microtus pinetorum	Woodland Vole	SSC	---	Eastern deciduous forests. They live on the forest floor in the thick layers of leaves and loose soil.	April-October	Low
Myotis lucifugus	Little Brown Bat	SSC	---	Water, fields, forest openings, and urban and suburban areas.	August-October	Low
Myotis septentrionalis	Northern Long-Eared Bat	SSC	T	Wooded and Semi wooded areas, mainly along streams. Maternity colonies are around hollow trees.	August-October	Low
Myotis sodalis	Indiana Bat	SE	LE	Wooded and Semi wooded areas, mainly along streams. Maternity colonies are around hollow trees.	August-October	Low
Perimyotis subflavus	Tri-Colored Bat	SSC	---	Open forest areas that are near a source of water.	August-October	Low
Peromyscus maniculatus	Deer Mouse	SSC	---	Forests, grasslands, brushlands, agricultural fields and deserts.	n/a	Low
Synaptomys cooperi	Southern Bog Lemming	SSC	---	Low, damp bogs and meadows with heavy vegetation growth	April-September	None
Taxidea taxus	Badger	SSC	---	Grassland species, specifically favoring habitats with short grass, such as fields and pastures.	June-September	None
BIRD						
Colinus virginianus	Northern Bobwhite	SSC	---	Forest edge	February-October	Low
Dolichonyx oryzivorus	Bobolink	SSC	---	Grassy hayfields and pastures, clover/alfalfa hayfields, wet prairies, and the grassy margins of marshes. Fallow fields composed of grasses and weeds also provide suitable nesting habitats.	May-June	None

Seiurus noveboracensis	Northern Waterthursh	SSC	---	Swampy woodlands.	n/a	None
FISH						
Esox masquinongy	Muskellunge	SCC	---	Heavily vegetated lakes with lots of tree stumps and bays. Prime stream muskellunge habitat is generally considered to be long pools (at least 0.2 miles in length) with a minimum depth of at least three to four feet and an abundance of submerged woody structure.	April-Early May	None
Moxostoma carinatum	River Redhorse	SSC	---	Found in only the largest rivers of the Ohio and Lake Erie drainage systems. They are typically found in deep pools with moderate current over bedrock or gravel substrate.	April-May	None
INVERTEBRATE						
Alasmidonta marginata	Elktoe	SSC	---	Medium to large size streams but is most common in smaller streams with moderately fast current and riffles. Fine gravel mixed with sand is preferred substrate.	June-July	Low
Gomphus externus	Plains Clubtail	E	---	Found near large, slow, muddy streams and rivers.	May-Late July	None
Orconectes (Rhoadesius) sloanii	Sloan's Crayfish	T	---	Headwater and small inland streams	August-October	Low
Truncilla donaciformis	Fawnsfoot	T	---	Prefers large rivers or the lower reaches of medium-sized streams. It is most commonly found in sand or gravel.	April-May	None
Truncilla truncata	Deertoe	SSC	---	Habitats of firm sand or gravel substrates in rivers and lakes with a moderately swift current, but has been observed occasionally in smaller streams	August-July	None
Villosa fabalis	Rayed Bean	E	E	Smaller, headwater creeks, but are sometimes found in large rivers and wave-washed areas of glacial lakes	n/a	Low
REPTILE						
Clemmys guttata	Spotted Turtle	T	---	Shallow, sluggish waters of ditches, small streams, marshes, bogs, and pond edges, especially where vegetation is abundant.	April-May	Low
Regina septemvittata	Queensnake	SSC	---	Prairie fens, wet meadows, wet prairies and associated open and wooded wetlands	February-March, May, August-September	None
Sistrurus catenatus	Eastern Massasauga	E	T	Wet prairies, sedge meadows, and early successional fields. Preferred wetland habitats are marshes and fens.	April-May	Low
AMPHIBIAN						
Eurycea lucifuga	Cave Salamander	E	---	In and around caves, seeps, springs, and small forested limestone creeks associated with groundwater. Rock crevices or under rocks, logs, or other debris.	December-February	None
Acris crepitans crepitans	Eastern Cricket Frog	SSC	---	The shores of sparesly vegetated permanent ponds and streams.	April-June	Low

PLANT						
Arabis pycnocarpa var. adpressipilis	Southern Hairy Rock Cress	P	---	Variable habitat from part-shade, open woods to sunny, open prairie.	n/a	Low
Arabis pycnocarpa va. Pycnocarpa	Western Hairy Rock Cress	X	---	Meadows, meadow slopes, juniper hills, pastures, rocky outcrops, roadsides.	n/a	Low
Bromus kalmia	Prairie Brome	P	---	Open upland woodlands, mesic to dry-mesic prairie, and grassy fens.	n/a	None
Carex mesochorea	Midland Sedge	T	---	Well-drained openings and clearings, oak woods and borders, fields.	n/a	Low
Carex timida	Timid Sedge	T	---	Wet/marshy areas, sedge meadows, forests, and prairies.	n/a	Low
Cyperus acuminatus	Pale Umbrella-sedge	P	---	Open, wet, sandy habitats. Sores, seepages and fields.	n/a	None
Echinodorus berteroi	Burhead	P	---	Muddy shores and shallow water of lakes, ponds, slow-moving streams, and ditches. Also in swamp woods and river bottoms.	n/a	Low
Ribes missouriense	Missouri Gooseberry	ST	---	Mesic to dry open woodlands, savannas, woodland borders, thickets, power line clearances and small meadows and wooded areas, abandoned fields, and partially shaded fence rows.	n/a	Low
Salix caroliniana	Carolina Willow	P	---	Wetland areas such as streams, swamps, marshes and retention ponds.	n/a	Low
Silene nivea	Snowy Campion	E	---	Forested river valley.	n/a	None
Viburnum molle	Soft-leaved Arrow-wood	T	---	Dry, rocky woods, grassland, shores of rivers or lakes.	n/a	None

1. STATE STATUS - X = extirpated, E = endangered, T = threatened, R = rare, SSC = special concern, WL = watch list, SG = significant, ** = no status but rarity warrants concern

Ohio Department of Natural Resources, Division of Wildlife Website - http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/publications/information/pub356.pdf (March 2016).

2. FEDERAL STATUS - E = endangered, T = threatened, R = rare, LELT = different listing for specific ranges or species, PE = proposed endangered , PT = proposed threatened, e/sa – appearance similar to a listed endanger species, **= not listed

United States Fish and Wildlife Service, County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species - http://www.fws.gov/midwest/endangered/lists/ohio-cty.html (January 2017).

3. Habitats and Breeding Periods described by:

a. NatureServe: An online encyclopedia of life [web application].2000. Version 1.1 Arlington, Virginia, USA: Association for Biodiversity information. Available: http://www.natureserve.org/ (Accessed January 6, 2017).
b. United States Fish and Wildlife Service Rayed Bean Fact Sheet - http://www.fws.gov/midwest/endangered/clams/rayedbean/RayedBeanFactSheet.html (January 6, 2017).
c. United States Fish and Wildlife Service Indiana Bat Fact Sheet - http://www.fws.gov/midwest/endangered/mammals/inba/index.html (January 6, 2017).
d. United States Fish and Wildlife Service Northern Long-eared Bat Fact Sheet - http://www.fws.gov/midwest/endangered/mammals/nleb/index.html (January 6, 2017).
e. United States Fish and Wildlife Service Eastern Massasauga Fact Sheet - http://www.fws.gov/midwest/endangered/mammals/inba/index.html (January 6, 2017).
f. United States Fish and Wildlife Service Running buffalo clover Fact Sheet - http://www.fws.gov/midwest/endangered/mammals/nleb/index.html (January 6, 2017).

4. Likelihood of occurrence: None, Low, Moderate, or High based on best available data and selective field observations.

From: susan_zimmermann@fws.gov on behalf of Ohio, FW3
To: Cori Jansing
Subject: Duke Energy OH F3886 Port Union to Muhlhauser Rebuild, Fairfield, Butler Co.
Date: Wednesday, September 11, 2019 9:35:31 AM

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

TAILS# 03E15000-2019-TA-1890

Dear Ms. Jansing,

We have received your recent correspondence regarding potential impacts to federally listed species in the vicinity of the above referenced project. There are no federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area. We recommend that proposed activities minimize water quality impacts, including fill in streams and wetlands. Best management practices should be utilized to minimize erosion and sedimentation.

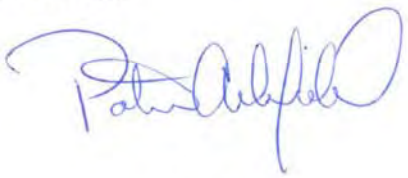
FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project type, size, location, and the proposed implementation of seasonal tree cutting (clearing of trees =3 inches diameter at breast height between October 1 and March 31) to avoid impacts to the federally listed endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*), we do not anticipate adverse effects to any federally endangered, threatened, proposed or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the U.S. Fish and Wildlife Service (Service) should be initiated to assess any potential impacts.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing should occur on any portion of the project area until consultation under section 7 of the Endangered Species Act (ESA), between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

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

Sincerely,



Patrice M. Ashfield
Field Office Supervisor

Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR MARY MERTZ, DIRECTOR

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

January 21, 2020

Cori Jansing
Cardno
11121 Canal Road
Cincinnati, Ohio 45241

Re: 19-741; F3886 Port Union to Muhlhauser Rebuild

Project: The proposed project invovles the removal and replacement of 17 existing structures with updated engineered steel monopoles.

Location: The proposed project is located in the City of Fairfield and West Chester Township, Butler County, Ohio.

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

Natural Heritage Database: The Natural Heritage Database has no records at or within a one-mile radius of the project area.

A review of the Ohio Natural Heritage Database indicates there are no other records of state endangered or threatened plants or animals within the project area. There are also no records of state potentially threatened plants, special interest or species of concern animals, or any federally listed species. In addition, we are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet fields and meadows. Due to the location and the type of habitat present at the project site, and within the vicinity of the project area, this project is not likely to impact this species.

The project is within the range of the cave salamander (*Eurycea lucifuga*), a state endangered species. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). Due to the location and the type of habitat present at the project site, and within the vicinity of the project area, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or Sarah.Tebbe@dnr.state.oh.us if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

Summary: Application of Duke Energy Ohio, Inc. Port Union to Mulhauser Rebuild Project-Part 2 electronically filed by Carys Cochern on behalf of Duke Energy