

Aquatic Resource Report for the Long Ridge Energy Terminal Project

Long Ridge Energy Terminal, LLC

Monroe County, Ohio and Marshall County, West Virginia

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ACRONYMS AND ABBREVIATIONS

Acronyms/Abbreviations	Definition
1987 Manual	United States Army Corps of Engineers Wetland Delineation Manual
Blue Racer	Blue Racer Midstream
CWH	Cold Water Habitat
EWH	Exceptional Warm Water Habitat
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
FR	Federal Register
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
HHEI	Headwater Habitat Evaluation Index
HMFEI	Headwater Macroinvertebrate Field Evaluation Index
HUC	Hydrologic Unit Code
LRET	Long Ridge Energy Terminal, LLC
LRW	Limited Resource Water
MWH	Modified Warm Water Habitat
NGL	Natural Gas Liquids
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
NRPWW	Wetlands adjacent to Non-Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
OBL	Obligate
ODNR	Ohio Department of Natural Resources
ОН	Ohio
Ohio EPA	Ohio Environmental Protection Agency
OHWM	Ordinary High Water Mark
ORAM	Ohio Rapid Assessment Method for Wetlands
OWI	Ohio Wetlands Inventory
PEM	Palustrine emergent

Acronyms/Abbreviations	Definition
PFO	Palustrine forested
PHWH	Primary Headwater Habitats
Project	Long Ridge Energy Terminal Project
PSS	Palustrine scrub-shrub
PUB	Palustrine unconsolidated bottom
QHEI	Qualitative Habitat Evaluation Index
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, April 2012
RPW	Relatively Permanent Water
RPWWD	Wetlands directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
RPWWN	Wetlands adjacent to but not directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
SRW	State Resource Water
SSH	Seasonal Salmonid Habitat
Tetra Tech	Tetra Tech, Inc.
TNW	Traditionally Navigable Water
TNWW	Wetlands Adjacent to Traditionally Navigable Waters
UNT	Unnamed tributary
UPL	Upland
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WV	West Virginia
WWH	Warm Water Habitat

1.0 INTRODUCTION

Long Ridge Energy Terminal, LLC (LRET) is proposing the construction of a two-component project involving the installation of a new natural gas liquids (NGL) pipeline and a new transloading facility as part of the Long Ridge Energy Terminal Project (Project). The pipeline will transport NGL from the existing processing facility owned by Blue Racer Midstream (Blue Racer) in Natrium, West Virginia (WV) across the Ohio River into Ohio (OH) and ultimately terminate at the LRET transloading facility at Hannibal, OH. The transloading facility will facilitate loading NGL onto railcars for shipment to regional markets. The Project is located in Marshall County, WV and Monroe County, OH, as shown on the United States Geological Survey (USGS) Project Location Map (Figure 1). The Project is in the Little Muskingum-Middle Island (Hydrologic Unit Code [HUC] 05030201) Watershed (USGS 2019).

Tetra Tech, Inc. (Tetra Tech), on behalf of LRET, prepared this Aquatic Resource Report summarizing the results of a field survey of the Project study area for the presence of wetlands and surface water features. Tetra Tech applied the methods detailed in the United States Army Corps of Engineers' (USACE) Wetland Delineation Manual (1987 Manual; Environmental Laboratory 1987), as amended by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0 (Regional Supplement; USACE 2012).

2.0 METHODS

The primary objective of the aquatic resource field survey is to identify and map potentially jurisdictional streams and wetlands for Project permitting; however, the survey also includes the identification and mapping of likely non-jurisdictional aquatic resources such as stormwater management features (e.g. stormwater retention ponds, ditches excavated wholly in and draining only uplands that do not carry a relatively permanent flow), drainage features, groundwater wells, and farm ponds.

2.1 FIELD SURVEY

Prior to the start of field surveys, an initial desktop analysis of the Project study area is conducted through a review of available Geographic Information Systems (GIS) resources. Information reviewed includes the following:

- USGS topographic mapping (Figure 1; National Geographic Society, i-cubed 2013).
- National Resources Conservation Service (NRCS) Web Soil Survey (Figures 2-1 to 2-3; NRCS 2017) mapping and data.
- USGS National Hydrography Dataset (NHD) Best Resolution for Ohio (Figures 3A-1 to 3A-3; USGS 2019)
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Figures 3A-1 to 3A-3; USFWS 2018).
- Ohio Department of Natural Resources (ODNR) Ohio Wetlands Inventory (OWI) Mapping (Figures 3B-1 to 3B-3; ODNR 2014)

All features identified in the field, including stream reaches, wetlands, and wetland upland points, are given unique identification names (i.e. S-ID, W-ID, and W-ID-UPL, respectively). In addition, the NHD stream name (USGS 2017) for field identified streams is recorded on the stream data form (Appendix A) and listed in Table 1. Identified streams without an NHD name are named, "Unnamed Tributary (UNT)" of the first named receiving waterbody.

Identified stream reaches are mapped along their entire course within the study area by use of a Global Positioning System (GPS) receiver with sub-meter accuracy or better. The identified streams are shown on the Aquatic Resource Location Map (Figures 4-1 to 4-27). Ohio Environmental Protection Agency (Ohio EPA) stream data forms detailing stream characteristics are provided in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features' respective stream data form.

Wetland delineation involves the establishment of the wetland/upland boundary based on the identification of hydrophytic vegetation, hydric soils, and wetland hydrology indicators. This delineated wetland boundary is mapped in the field by use of a GPS receiver. Delineated wetlands are shown as closed or open boundary systems on the Aquatic Resource Location Map (Figures 4-1 to 4-27). Wetlands that continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as open boundary wetland systems. Wetlands that do not continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as closed boundary wetland systems. Data collected on vegetation, soils, and hydrology for identified wetlands and their associated upland points are recorded on USACE Wetland Determination Data Forms (Appendix B). Photographs and photograph location maps of each identified wetland are included immediately following each features' respective USACE Wetland Determination Data Form. Ohio Rapid Assessment Method for Wetlands (ORAM) data forms are provided in Appendix C.

Resumes of all personnel that performed the field surveys are provided in Appendix D.

2.2 STREAM IDENTIFICATION

Potentially jurisdictional streams are identified in the field by the presence of a continuous channel that exhibits evidence of frequent or reoccurring water flow such as a defined bed, bank, and an ordinary high-water mark (OHWM; USACE and United States Environmental Protection Agency [USEPA] 2007).

Physical and biological characteristics of the identified streams are evaluated to determine Flow Regime (82 Federal Register [FR] 1860, January 6, 2017), USACE Waters Type (USACE and USEPA 2007), and Cowardin classifications (Cowardin et al. 1979). Physical characteristics evaluated include, but are not limited to: channel morphology, substrate size and type, and base flow conditions. Biological characteristics evaluated include but are not limited to: the presence of fish, aquatic macroinvertebrates, and vegetation rooted within the OHWM. USACE Water Types (USACE and USEPA 2007) include:

- Traditional Navigable Water (TNW) All "navigable waters of the U.S.," defined in 33 CFR Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact.
- Relatively Permanent Waters (RPW) Streams that flow directly or indirectly into TNWs and where the flow
 of water is continuous year-round or at least seasonally.
- Non-RPW (NRPW) Streams that flow directly or indirectly into TNWs where the flow of water is not
 continuous at least seasonally.

Flow Regimes (82 FR 1860, January 6, 2017) include:

- Perennial Streams that typically have flow year-round. Most of the hydrology for perennial streams is
 derived from smaller upstream waters and/or groundwater sources with precipitation as a
 supplemental hydrologic contributor. Perennial streams are classified as RPW or TNW USACE
 Waters Types (USACE and USEPA 2007).
- Intermittent Streams with seasonal flow, typically during the wet season (winter through spring). At least
 a portion of the hydrology for intermittent streams is derived from groundwater sources with
 precipitation as a supplemental hydrologic contributor. Intermittent streams are classified as an
 RPW USACE Waters Type (USACE and USEPA 2007).
- Ephemeral Rain-dependent streams flowing only after precipitation event. Precipitation driven run-off
 from the localized surrounding landscape is the primary source of hydrology. Ephemeral streams
 are different from non-jurisdictional ditches and drainages due to the presence of an observable
 OHWM. Ephemeral streams are classified as an NRPW USACE Waters Type (USACE and USEPA
 2007).

2.3 OHIO EPA STREAM EVALUATIONS

Streams with a watershed size greater than one square mile or where the predominant natural pool depth is greater than 40 centimeters (15.75 inches) are evaluated using the Qualitative Habitat Evaluation Index (QHEI) methods outlined in the *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI*; Ohio EPA 2006). The QHEI is a quantitative evaluation of physical stream characteristics which are important for supporting fish communities. Six individual metrics are scored then added; the total maximum score of this quantitative evaluation is 100. For headwater streams QHEI scores greater than or equal to 70 correspond to an excellent rating, 55 - 69 to a good rating, 43 - 54 to a rating of fair, 30 - 42 to a rating of poor, and less than 30 to a rating of very poor. For streams with larger watersheds QHEI scores greater than or equal to 75 correspond to an excellent rating, 60 - 74 to a good rating, 45 - 59 to a rating of fair, 30 - 44 to a rating of poor, and less than 30 to a rating of very poor.

Headwater streams, defined by the Ohio EPA as streams with a drainage area less than one square mile, are evaluated using the Headwater Habitat Evaluation Index (HHEI) methods outlined in the *Field Evaluation Manual for Ohio's Primary Headwater Streams* (Ohio EPA 2012). Level 1 Assessments are performed at all headwater streams identified within the Project study area. A Level 1 Assessment consists of an evaluation of the stream's physical characteristics using the HHEI. Level 2 and Level 3 Assessments are evaluations of the biological community and are not performed as part of this field survey.

The results of the HHEI evaluation designate streams as either Modified Class I, Modified Class II, Class II, or Class III (Class IIIA or Class IIIB) Primary Headwater Habitats (PHWH). These designations are defined under Ohio Administrative Code (OAC) 3745-1-07 as;

- Class I PHWH Ephemeral streams that have little or no aquatic life potential, except seasonally when flowing water is present for short time periods following precipitation or snow melt.
- Class II PHWH Intermittent or perennial streams that exhibit moderately diverse communities of warm
 water-adapted native fauna present either seasonally or year-round. The native fauna is characterized by
 species of vertebrates (temperature facultative species of amphibians and pioneering species of fish) and
 benthic macroinvertebrates.
- Class III PHWH Perennial streams in which the prevailing flow and temperature conditions are influenced
 by groundwater. They exhibit moderately diverse to highly diverse communities of cold water adapted native
 fauna present year-round. Class III PHWH streams are further divided into the two sub-classifications
 below; however, since Level 2 or 3 Assessments are not performed as part of this field survey, all Class III
 PHWH streams identified as part of this survey will be designated as Class IIIB PHWH streams, as per the
 Field Evaluation Manual for Ohio's Primary Headwater Streams (Ohio EPA 2012).
 - o Class IIIA Streams exhibit diverse communities of native fauna.
 - o Class IIIB Streams exhibit superior species composition or diversity of native fauna.
- Modified PHWH Class I and Class II PHWH streams may be further classified as modified habitats if they
 are historically channelized watercourses, have permanent structures to impound free-flowing water, or
 otherwise have human induced channel modifications that are of long-lasting duration.

An HHEI and QHEI may be completed in conjunction if a stream has watershed less than one square mile but exhibits predominant natural pools greater than 40 centimeters (15.75 inches) in depth.

Stream designations are identified and classified in with OAC 3745-1 Water Quality Standards (OAC 2017).

2.4 WETLAND DELINEATION

Wetland delineations are conducted in accordance with the 1987 Manual (Environmental Laboratory 1987) and the Regional Supplement (USACE 2012). According to the 1987 Manual (Environmental Laboratory 1987), an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria: predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions); hydric soils (soils formed under water, or in saturated conditions); and wetland hydrology (current or recent inundation or saturated soils at some time during the growing season).

2.4.1 Hydrophytic Vegetation

Hydrophytic vegetation is identified in the field based on the *Regional Supplement* (USACE 2012). Plant species representative of the habitats within the Project study area are identified to the species taxonomic level and the indicator status for each plant species is identified using *The National Wetland Plant List: 2016 Wetland Ratings* (Lichvar 2016). Wetland indicator statuses are described below (Reed 1988):

- Obligate (OBL) almost always occurs in wetlands; estimated probability of occurrence in a wetland is greater than 99 percent.
- Facultative Wetland (FACW) usually occurs in wetlands but may occur in non-wetlands; estimated
 probability of occurrence in a wetland is 67 to 99 percent.
- Facultative (FAC) equally likely to occur in wetlands and non-wetlands; estimated probability of occurrence in a wetland is 34 to 66 percent.
- Facultative Upland (FACU) usually occurs in non-wetlands but may occur in wetlands; estimated probability of occurrence in a wetland is 1 to 33 percent.
- Upland (UPL) rarely occurs in wetlands; estimated probability of occurrence in a wetland is less than 1
 percent.

Hydrophytic vegetation includes species with an indicator status of OBL, FACW, or FAC. Hydrophytic vegetation decisions are based on the plant community typically present during the wet portion of the growing season during a normal rainfall year. In areas where human practices or natural events have influenced vegetation, procedures for difficult or problematic situations outlined in the *Regional Supplement* (USACE 2012) are followed.

Wetlands habitat types are based on vegetation strata composition and are classified in accordance with the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979):

- Palustrine emergent (PEM) contain emergent, herbaceous (non-woody) plants which are the tallest life form with at least 30 percent aerial coverage.
- Palustrine scrub-shrub (PSS) contain woody plants less than six meters (20 feet) in height which are the
 tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less
 than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as
 woody plants at least six meters (20 feet) in height, and shrubs are defined as woody plants less
 than six meters (20 feet) in height.
- Palustrine forested (PFO) contain woody plants at least six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage.
- Palustrine unconsolidated bottom (PUB) contain all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover of less than 30 percent.

2.4.2 Hydric Soils

Hydric soils are identified in the field based on the 1987 Manual (Environmental Laboratory 1987), Regional Supplement (USACE 2012), and Field Indicators of Hydric Soils in the United States (United States Department of Agriculture [USDA] 2010). Based on prior experience, the presence of field-identified hydric soils does not always align with NRCS mapped hydric soils units. The NRCS soil units represent a large geographic area and are based on broad geologic and historic conditions. The methods used in the Field Indicators of Hydric Soils in the United States (USDA 2010) are used to determine hydric soil conditions on a localized scale. A review of the NRCS mapped hydric soils units is used to initially identify areas that have the potential to contain wetlands (See Section 3.2); however, wetland delineation boundaries are based on the presence of field identified hydric soils. In cases where soils are found to be disturbed or problematic, determinations may rely on the NRCS mapped hydric soil units (USACE 2012).

2.4.3 Wetland Hydrology

Wetland hydrology indicators are identified in the field based on the 1987 Manual (Environmental Laboratory 1987) and Regional Supplement (USACE 2012). Hydrogeomorphic (HGM) and Water Type classifications are assigned to wetlands based on their hydrologic source and connectivity to streams. HGM classifications are based on A

Hydrogeomorphic Classification for Wetlands (Brinson 1993); a summary of HGM classifications commonly used in the Project region is described below:

- Riverine Wetlands occur in floodplains and riparian corridors in association with stream channels.
- Depressional Wetlands occur in topographic depressions. Dominant water sources are precipitation ground water discharge, and both interflow and overland flow from adjacent uplands.
- Slope Wetlands normally are found where there is a discharge of ground water to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes.

Wetland USACE Water Types (USACE and USEPA 2007) include:

- TNWW Wetlands adjacent to TNWs.
- RPWWD Wetlands directly abutting RPWs that flow directly or indirectly into TNWs.
- RPWWN Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs.
- NRPWW Wetlands adjacent to NRPWs that flow directly or indirectly into TNWs.
- Isolate Isolated (interstate or intrastate) waters, including isolated wetlands.

Current wetland hydrology indicators, inundation/saturation visible on aerial imagery, and estimates of the effects of ditches and subsurface drainage systems are all considered when making decisions regarding wetland hydrology in areas where human practices or natural events may have altered wetland hydrology.

2.5 ORAM ASSESSMENT

The Ohio Rapid Assessment Method for Wetlands (ORAM) is used to assess the ecological quality and level of function of each identified wetland system as required by the Ohio EPA. The assessments are conducted using the methods in the *Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms* (Mack 2001). The ORAM uses metrics relating to wetland size, adjacent upland land use, hydrology, habitat alteration, special habitats, and plant communities to calculate and assign each wetland system to a Category. Wetlands are designated as either Category 1, Category 2, Modified Category 2, or Category 3. These categories correspond to wetlands of low, medium, and high quality, respectively.

Wetlands may be scored together in circumstances where wetlands are small (< 1 acre), located near each other within the same forest, floodplain, soil mapping unit, field, etc., and are separated from each other by relatively narrow areas of non-wetland (Mack 2001).

3.0 RESULTS

Tetra Tech performed field surveys for Long Ridge Energy Terminal Project between July 17th and November 12th, 2019. Surveys were limited to the Project study area illustrated on Figures 1 through 4. The field surveys identified 30 streams reaches and 26 wetlands within the Project study area. The Aquatic Resource Location Map (Figures 4-1 to 4-27) illustrate the wetland and stream locations in relation to the Project study area. Tables 1 and 2 summarize stream and wetland information for all identified streams reaches and wetlands. Ohio EPA stream data forms (HHEI and/or QHEI) are included in Appendix A, Wetland Determination Data Forms for wetlands and their associated upland points are included in Appendix B, and ORAM Data Forms are provided in Appendix C.

This aquatic resource report represents our best professional judgment and is based on site conditions at the time of the field investigation. However, final authority over the determinations made during these surveys rests with the Ohio EPA and the USACE.

3.1 STREAM IDENTIFICATION AND EVALUATION

Thirty stream reaches were identified in the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment. A summary of the data for each identified stream reach is provided in Table 1. Table 1 shows the stream reach field identification name, the NHD stream name, stream location, Flow Regime classification, Water Type classification, Cowardin classification, HHEI and/or QHEI score, HHEI class and/or QHEI narrative rating, bank full width, (in meters and feet), and flow direction, and Figure 4 sheet location. Ohio EPA Stream data forms (HHE and/or QHEI) data forms are provided for each stream reach in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features' respective stream data form.

3.2 WETLAND IDENTIFICATION AND DELINEATION

NRCS, USFWS NWI, and ODNR OWI mapping were reviewed for the initial desktop analysis of the Project study area to identify areas that may have the potential to contain wetlands. Tables 3 and 4 summarize the NRCS hydric soils list for Marshall County, WV and Monroe County, OH. The NRCS soil survey mapping units are shown on Figures 2-1 to 2-3. A review of the USFWS NWI and ODNR OWI mapping indicates that one NWI wetland and one OWI wetland are mapped in the Project study area (Figures 3A-1 to 3A-3, Figure 3B-1 to 3B-3). The single NWI mapped wetland within the Project study area is a palustrine unconsolidated bottom, intermittently exposed, diked/impounded (PUBGh) wetland that correlates with field delineated PEM wetlands W-WJKM04a and W-WJKM04b (Figure 3A-2 and Figure 4-13). The single OWI mapped wetland within the Project study area is a PEM wetland that lies within the banks of the Ohio River (Figure 3B-1 and Figure 4-2).

Twenty-six wetlands are located within the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment.

A summary of each wetland identified and delineated within the Project study area is provided in Table 2. Table 2 shows the location of each wetland, Cowardin classification, HGM classification, Waters Type classification, the identity of any associated (i.e. abutting or adjacent) waterbodies, wetland size within the Project study area (in acres and square feet), whether the wetland boundary is open or closed (see Section 2.1), ORAM score and Category, and Figure 4 sheet location. Wetlands with multiple Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland. The wetland size provided in Table 2 represents the size of the delineated wetland boundary shown on Figures 4-1 to 4-27. Open boundary wetlands continue beyond the delineated wetland boundary shown on Figures 4-1 to 4-27; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in Table 2.

USACE Wetland Determination Data Forms detailing the existing vegetation, soil characteristics, and hydrology for each wetland and its associated upland point are provided in Appendix B. Photographs and photograph location maps of each identified wetland are included immediately following each features' respective USACE Wetland Determination Data Form. ORAM data forms are provided in Appendix C.

4.0 CONCLUSION

During the field survey of the Long Ridge Energy Terminal Project, 30 stream reaches and 26 wetlands were identified within the Project study area. A summary of identified stream reach and wetland data is provided in Tables 1 and 2 and locations of all streams and wetlands are shown on the Aquatic Resource Location Map (Figures 4-1 to 4-27).

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over the determinations made during this survey rests with the Ohio EPA and the USACE

5.0 REFERENCES

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USGS (United States Geological Survey). 2019. National Hydrography Dataset Best Resolution for Ohio. https://viewer.nationalmap.gov/basic/?basemap=b1&category=nhd&title=NHD%20View

FIGURES

Figure 1: USGS Project Location Map

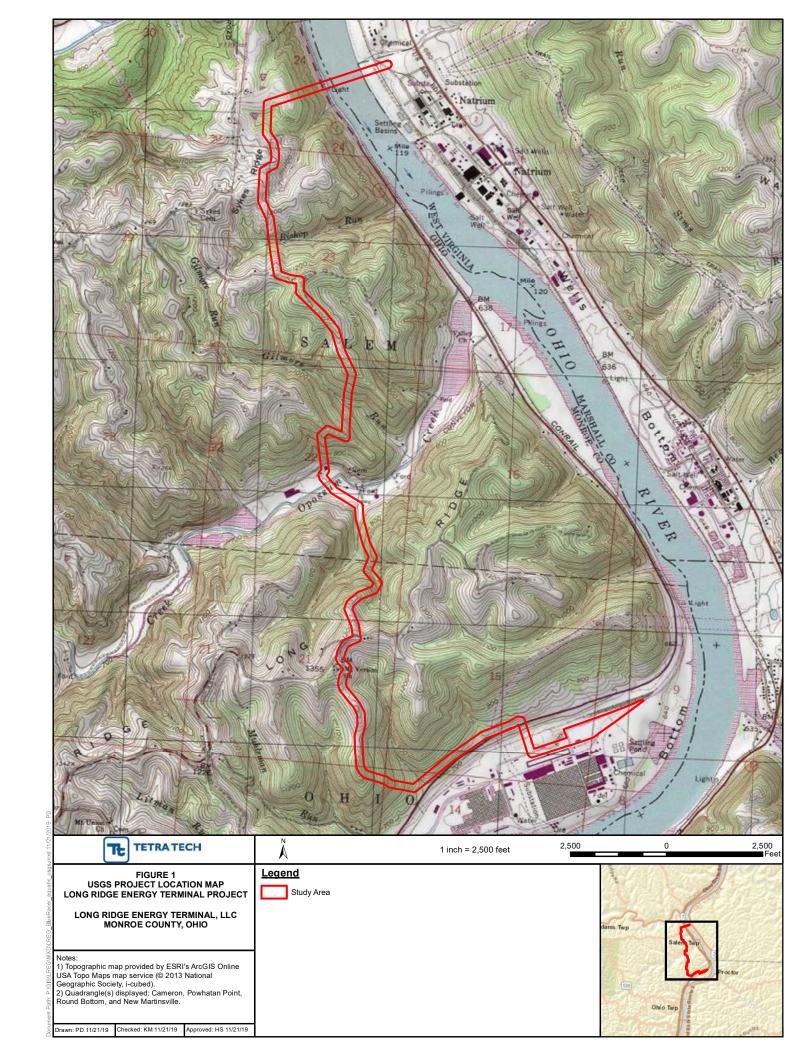
Figures 2-1 to 2-3: NRCS Soils Map

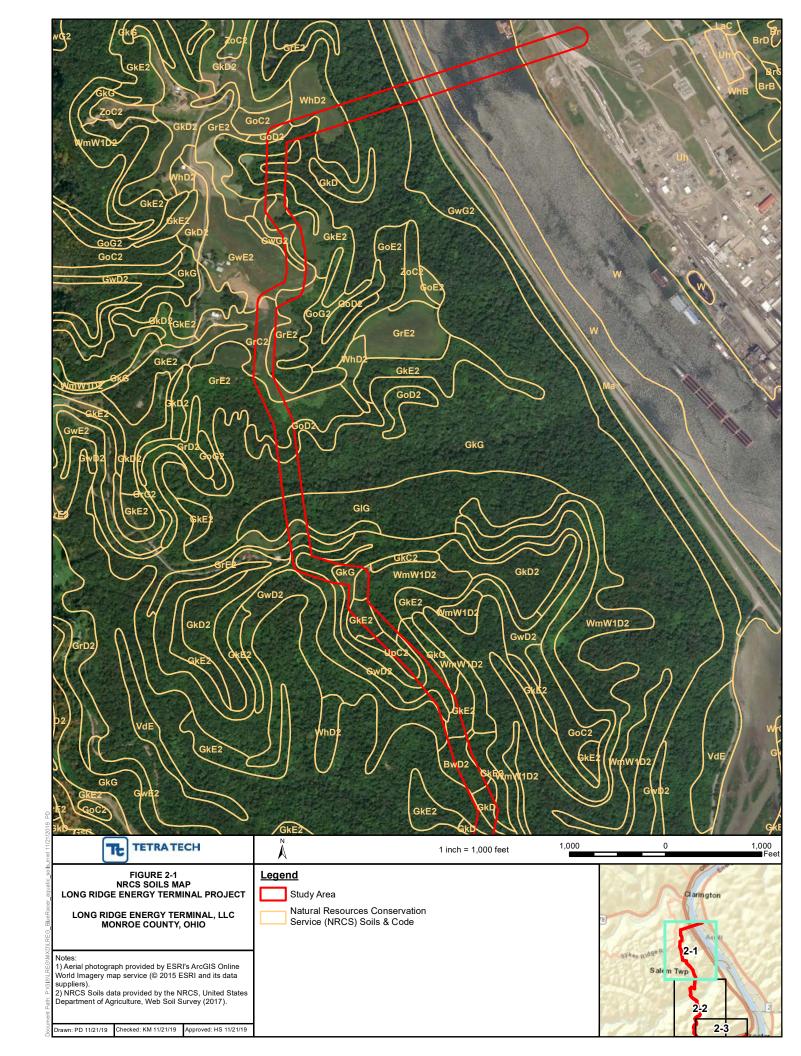
Figures 3A-1 to 3A-3: NWI Wetlands and NHD Streams Map

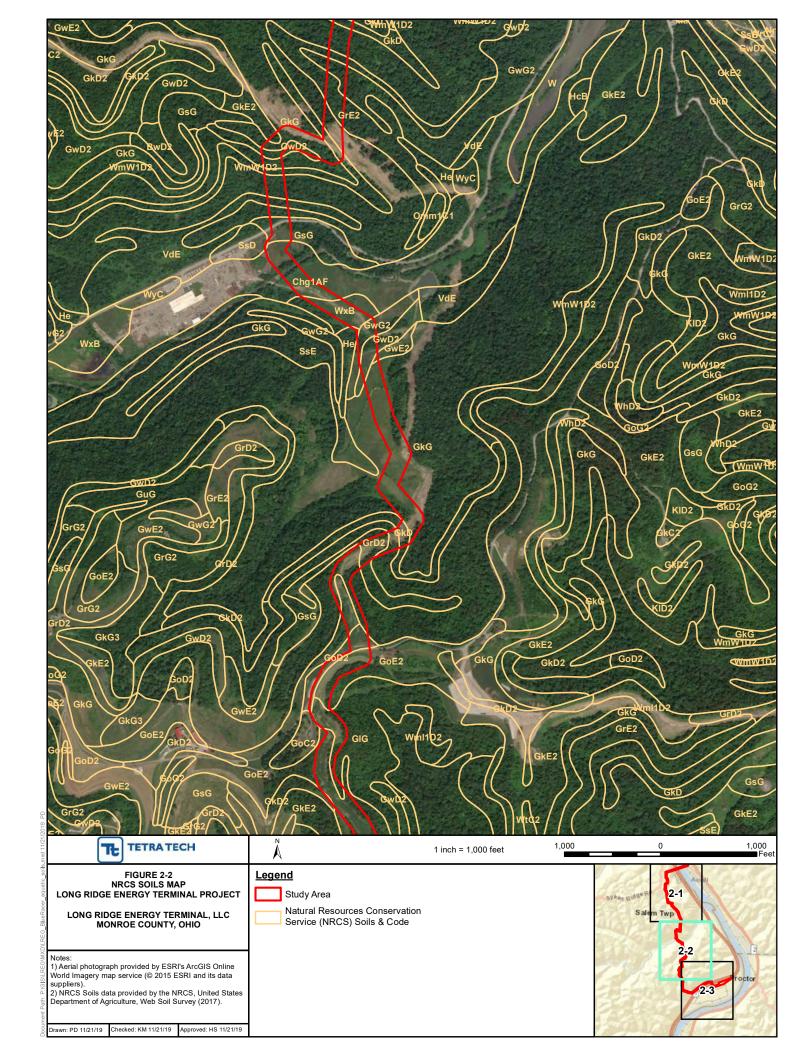
Figures 3B-1 to 3B-3: OWI Wetlands Map

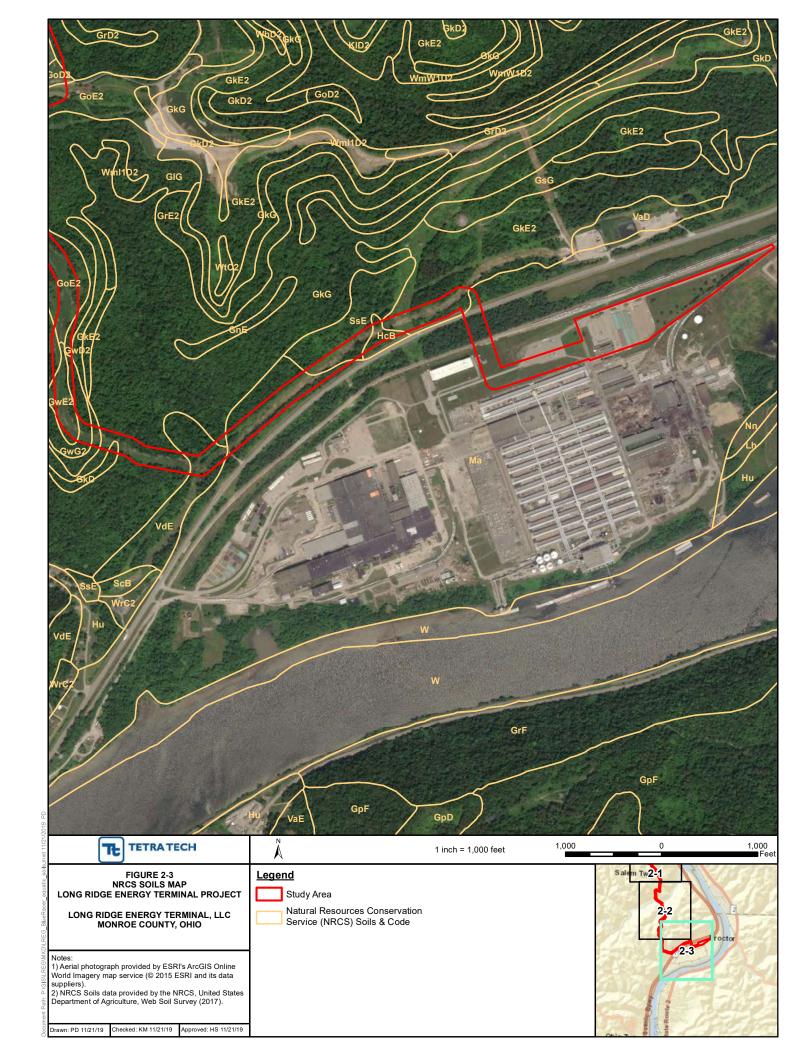
Figure 4-INDEX: Aquatic Resource Location Index Map

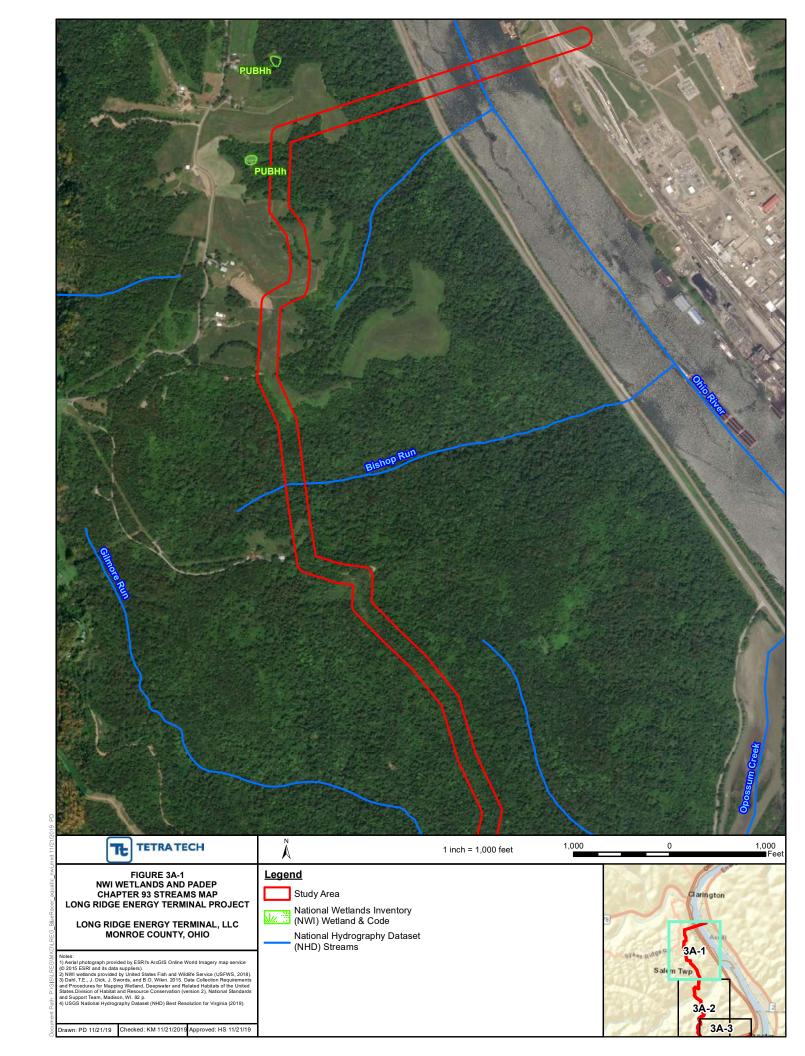
Figures 4-1 to 4-27: Aquatic Resource Location Map

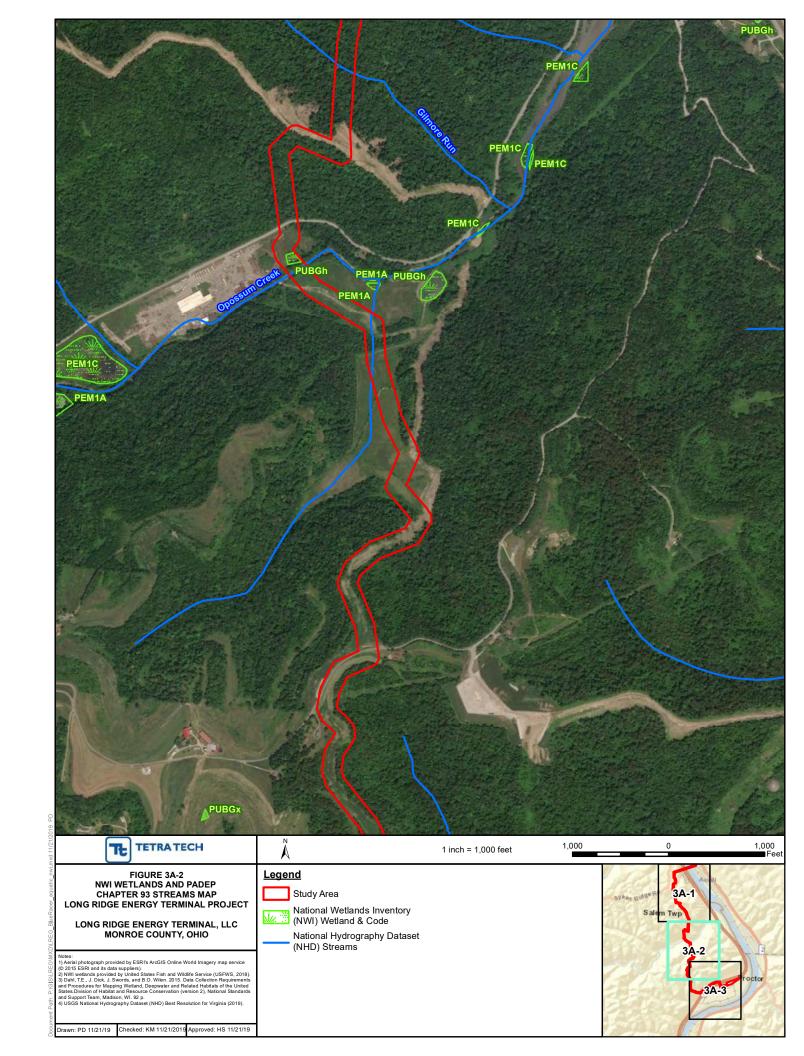


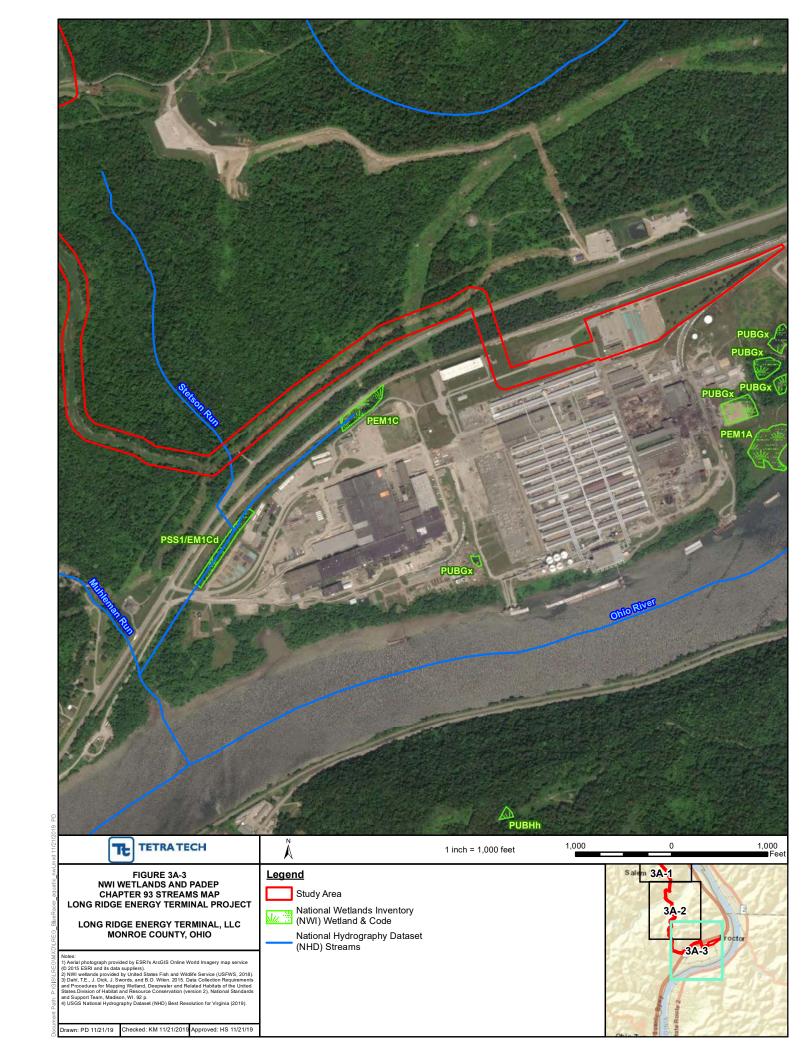


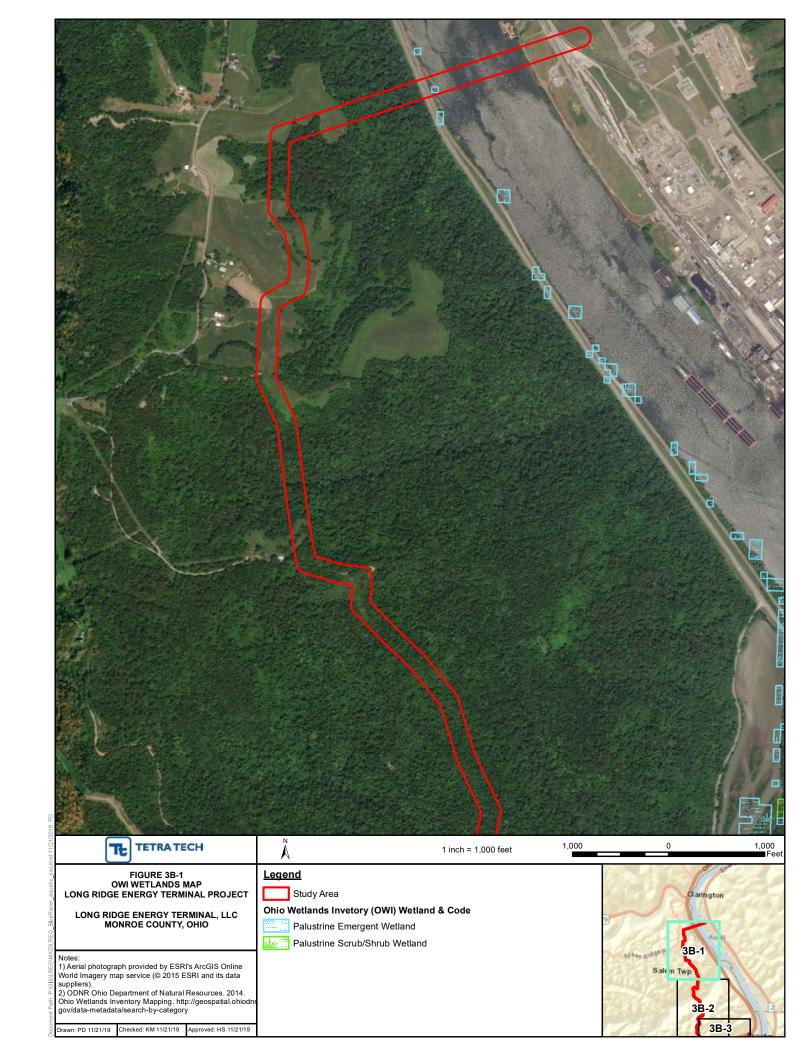


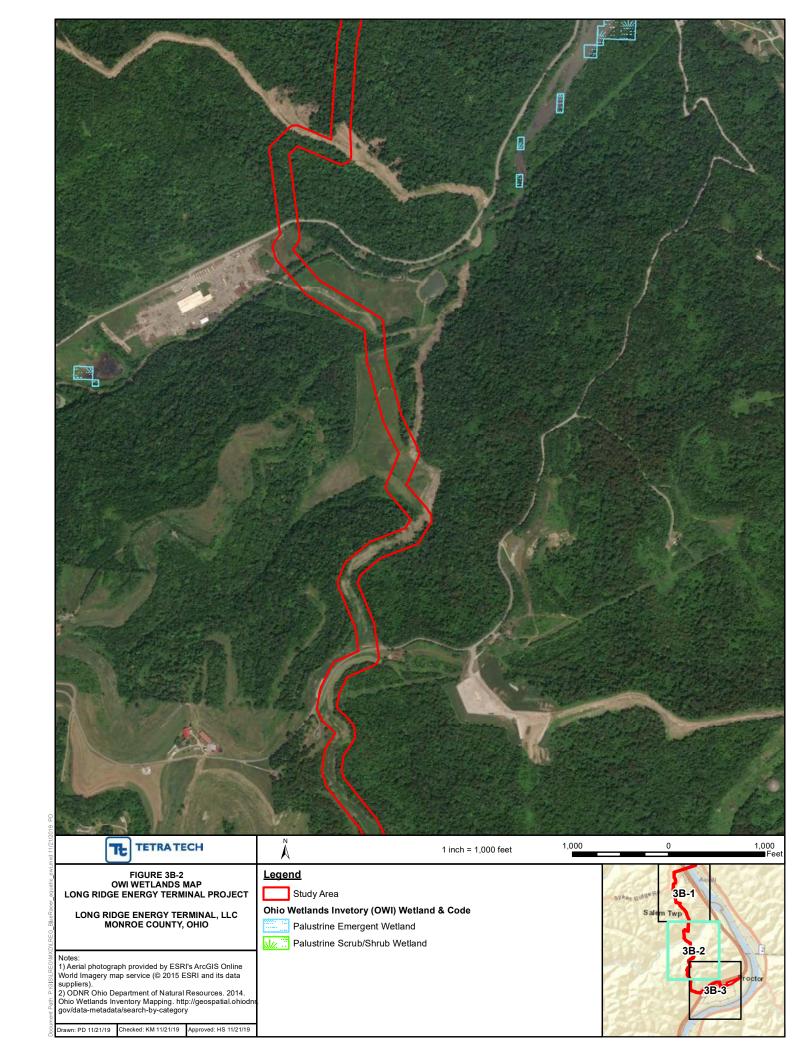


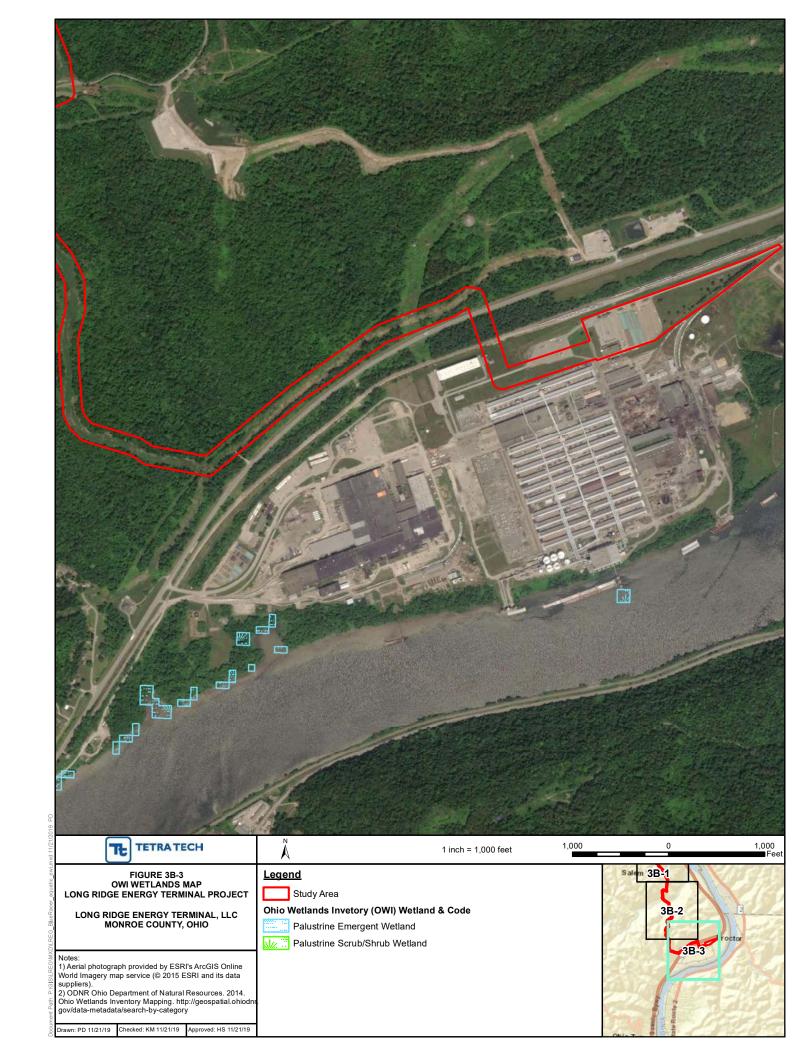


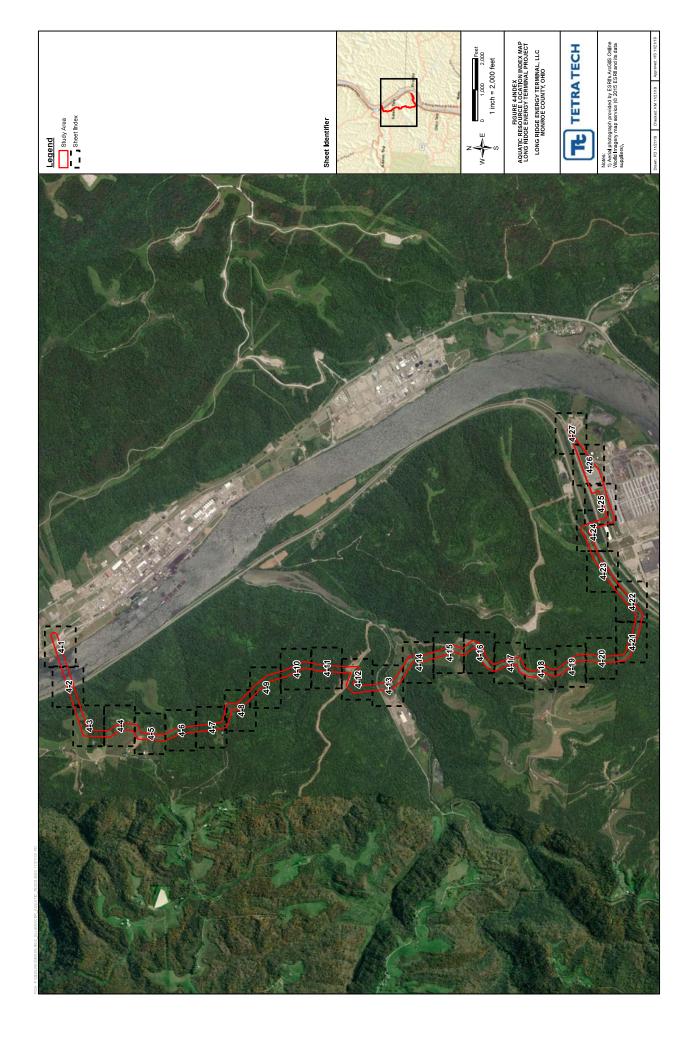


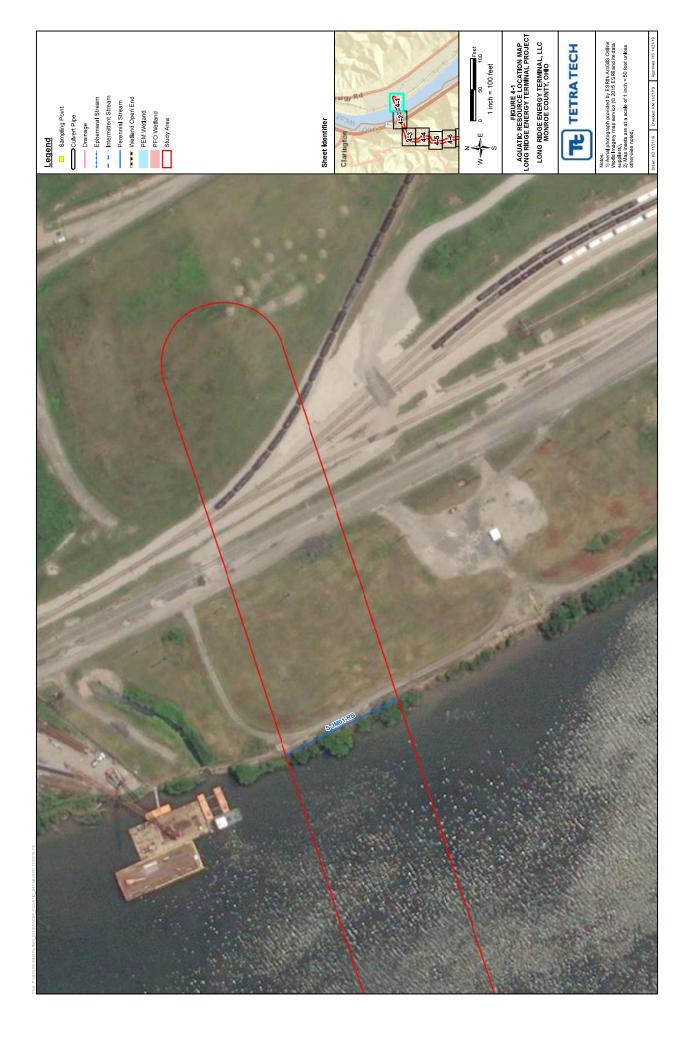








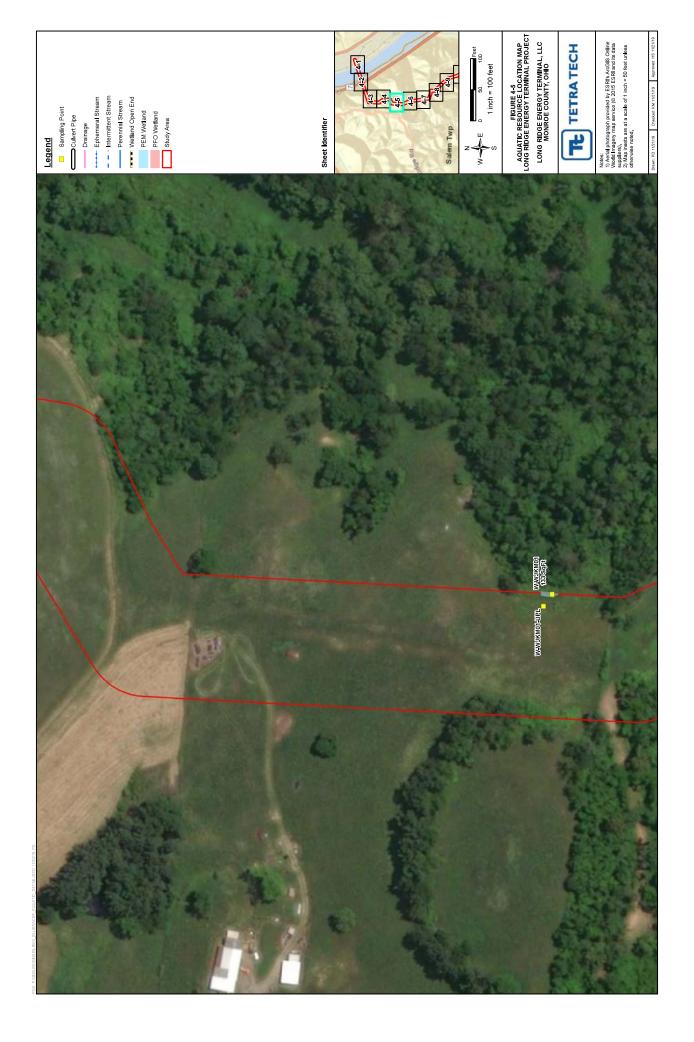


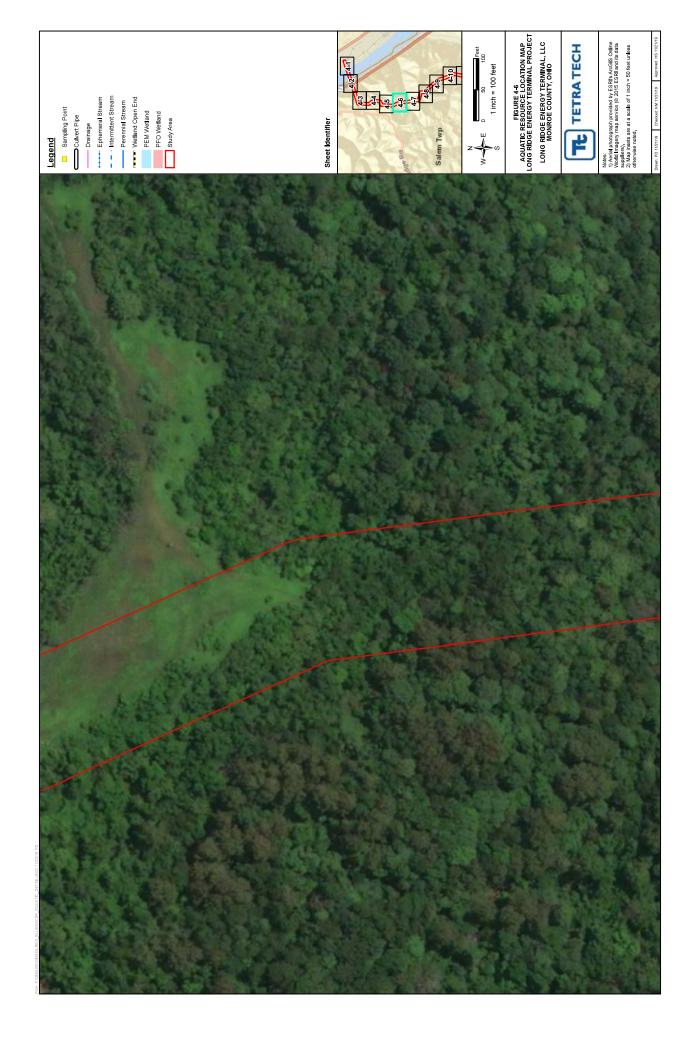






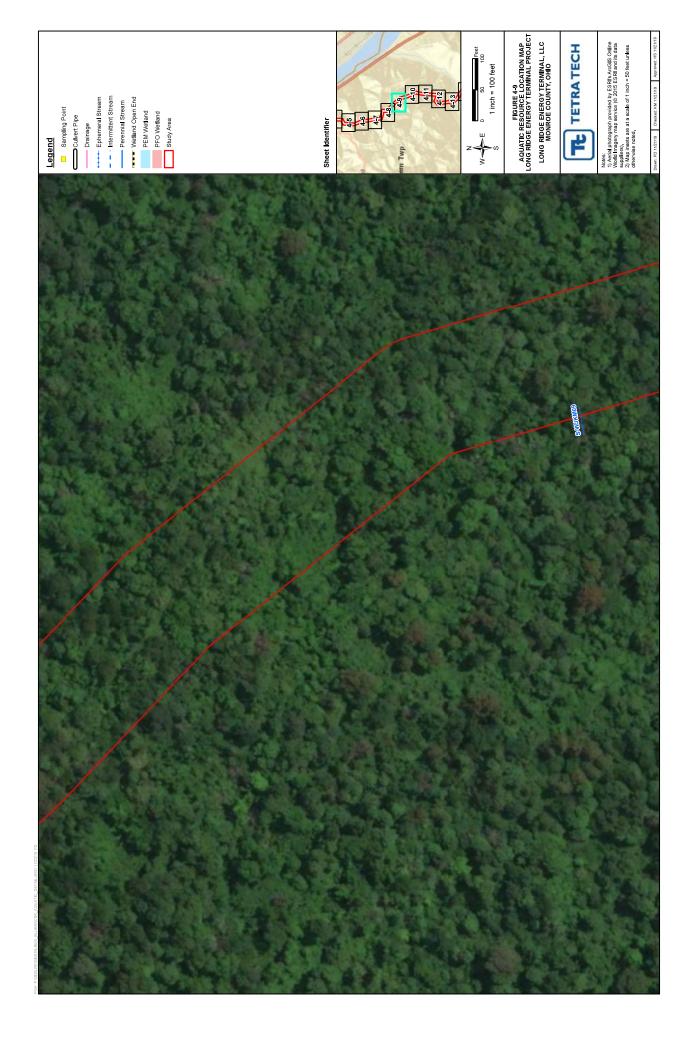


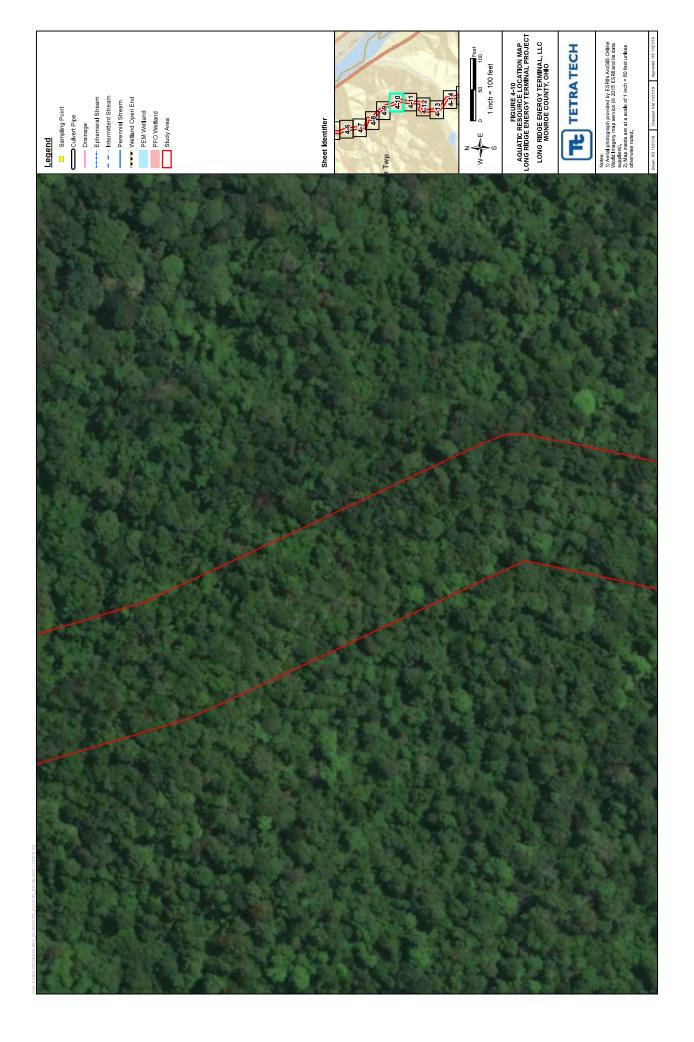
















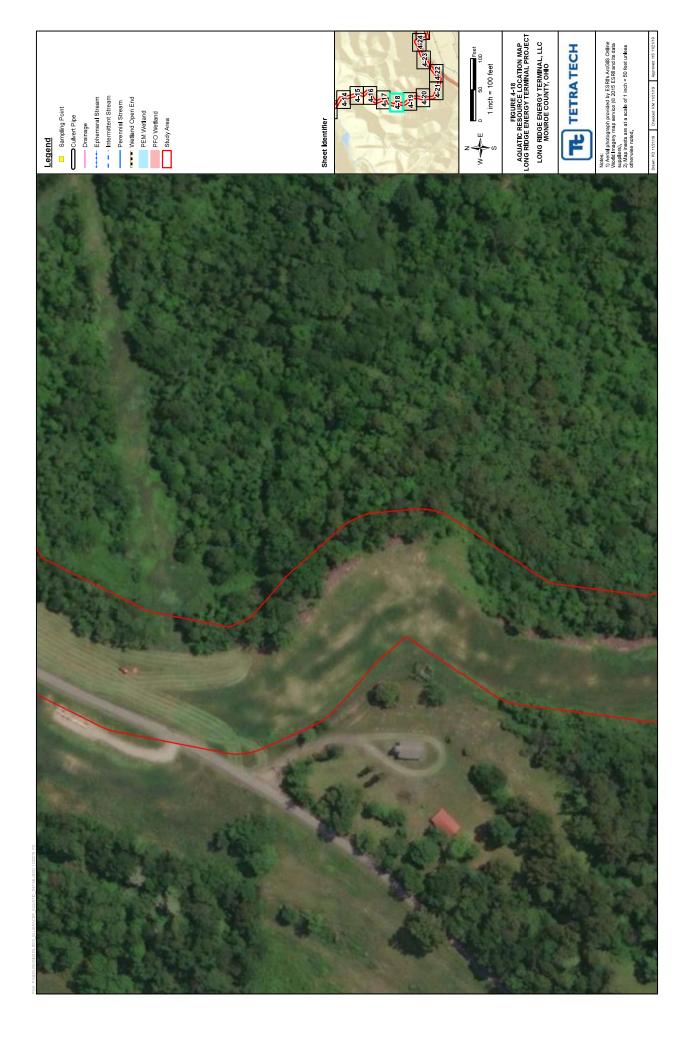










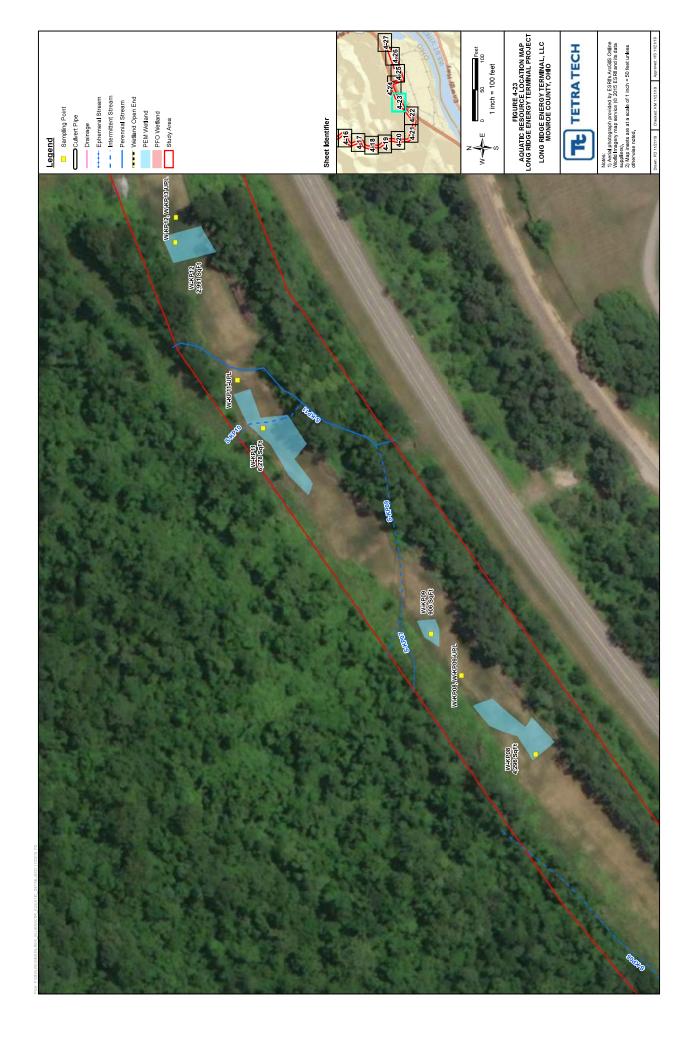




















TABLES

Table 1: Identified Streams

Table 2: Identified Wetlands

Table 3: Marshall County Hydric Soil List

Table 4: Monroe County Hydric Soil List

Figure(s)	4-3	4-3	4-3	4-3	4-3	4-3	4-4	4-7	4-9	4-11	4-11	4-11	4-11	4-12	4-13	4-13	4-15, 4-16	4-14	4-14	4-22	4-22	4.22, 4.23	4-23	4-23	4-23	4-23	4-24	4-24	4-24	4-1, 4-2
Flow Direction	s	S	SW	S	ш	s	NE	3	M	Е	NE.	N	SW	SW	SS	N	M	WN	N.	SE	SE	SW	Е	SE	SS	SW	SE	SW	SE	ø
Bank Full Width (feet)	2.00	1.00	2.00	4.00	5.00	2,00	1,50	8,00	1.00	20.00	1.00	2.00	1.50	2.00	7.00	65.00	2.00	0.50	2.00	0.50	6.00	1.00	2,00	0.50	1.00	2.00	1.00	3.00	1.00	1,058.00
Bank Full Width (meters)	0.61	0,30	0,61	1,22	1,52	0,61	0.46	2.44	0.30	6.10	0,30	0.61	0,46	0,61	2,13	19.81	1.50	0,15	1.50	0,15	1.80	0,30	0,61	0,15	0,30	1,52	0,30	0,91	0.30	322.50
HHEI Class/QHEI Narrative Rating ⁶	Modified Class	Modified Class	Modified Class	Class II	Class II	Class	Class	Class III/Excellent	Class	Class III/Excellent	Class	Class	Class	Class	Modified Class II	Fair	Modified Class II	Class	Modified Class II	Modified Class	Modified Class II/Fair	Modified Class	Modified Class	Modified Class	Modified Class	Modified Class II	Modified Class	Modified Class II	Modified Class II	Good
HHEI/QHEI Score	20.0	17.0	17.0	47.0	57.0	11.0	13.0	78.0 / 70.0	18.0	89.0 / 70.0	26.0	26.0	24.0	24.0	67.0	48.0	57.0	29.0	42.0	24.0	70.0751.0	23.0	25.0	18.0	21.0	56.0	30.0	47.0	31.0	0.69
Cowardin Class ⁵	R6	R6	R6	R6	R3UB1	R6	R6	R3RB1	R6	R3RB1	R6	R6	R4SB5	R6	R3UB1	R3UB1	R4SB	R4SB3	R3UB	R4SB3	R3UB	R4SB5	R4SB3	R6	R4SB4	R3UB1	R6	R3UB1	R4SB3	R2UB1
Water Type⁴	NRPW	NRPW	NRPW	NRPW	RPW	NRPW	NRPW	RPW	NRPW	RPW	NRPW	NRPW	RPW	NRPW	RPW	RPW	RPW	RPW	RPW	RPW	RPW	RPW	RPW	NRPW	RPW	RPW	NRPW	RPW	RPW	RPW
Flow Regime	Ephemeral Stream	Ephemeral Stream	Ephemeral Stream	Ephemeral Stream	Perennial Stream	Ephemeral Stream	Ephemeral Stream	Perennial Stream	Ephemeral Stream	Perennial Stream	Ephemeral Stream	Ephemeral Stream	Intermittent Stream	Ephemeral Stream	Perennial Stream	Perennial Stream	Intermittent Stream	Intermittent Stream	Perennial Stream	Intermittent Stream	Perennial Stream	Intermittent Stream	Intermittent Stream	Ephemeral Stream	Intermittent Stream	Perennial Stream	Ephemeral Stream	Perennial Stream	Intermittent Stream	Perennial Stream
Longitude³	80.870663	80.870647	80.870625	80.871198	80.871870	80.871694	80.871726	80 870809	80.864983	80.863556	80.863900	80.863804	80.863545	-80.865919	80.865467	80.865068	80.860411	80.862095	80.862046	80.856014	80.855391	80.853088	80,851102	80,851703	80,850391	80.850211	80 847441	80.847292	80.846698	-80.866469
Latitude³	39,752721	39,752870	39,752703	39.752552	39.751548	39,751641	39,749990	39,742487	39.735695	39,731213	39,731186	39.731074	39,730478	39.727736	39,726748	39,725481	39.719116	39,722703	39.723119	39,703949	39.704360	39,706191	39,707075	39.706999	39,707662	39,707604	39,708888	39,708869	39,708781	39.753945
County	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Monroe	Marshall County, WV;							
NHD Stream Name ²	UNT to Ohio River	Bishop Run	UNT to Gimore Run	Gilmore Run	UNT to Gilmore Run	UNT to Gimore Run	UNT to Gilmore Run	UNT to Opossum Creek	UNT to Opossum Creek	Opossum Creek	UNT to Opossum Creek	UNT to Opossum Creek	UNT to Opossum Creek	UNT to Stetson Run	Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	UNT to Stetson Run	Ohio River						
Stream Reach ID	S-WJKM01	S-WJKM02	S-WJKM03	S-WJKM04	S-WJKM05	S-WJKM06	S-WJKM07	S-WJKM08	S-WJKM09	S-WJKM10	S-WJKM11	S-WJKM12	S-WJKM13	S-WJKM14	S-WJKM15	S-WJKM16	S-KP01	S-KP02	S-KP03	S-KP04	S-KP05	S-KP06	S-KP08	S-KP07	S-KP10	S-KP11	S-KP13	S-KP12	S-KP14	S-JM01
Stream Number ¹	-	2	3	4	2	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	56	27	28	53	8

- Streams with braided channels, streams that have different flow regimes (e.g., ephermed) and intermittent) within the surveyed reach, and IHID named stream vaith different flow regimes (e.g., ephermed) as single streams.

- or donafined degree series without a VID (National Hydrogality) claimed) name, the dentified stream was given the name. Unamed Thioliany (UNT), of the first named receiving waterbody

- Revertible of the stream of the stream

Longitude ²	
3 871736 PEM	
3 865057 PEM	-80.865057 PEM
3.865287 PEM	-80.865287 PEM
	-80.864461 PFO
3.861765 PEM	-80,861765 PEM
	-80.855599 PEM
3 852243 PEM	
3 844767 PEM	-80.844767 PEM
3.849387 PEM	
3.847725 PEM	
	-80.846634 PEM
.839296 PEM	-80.839296 PEM
38248 PEM	-80.838248 PEM
80.838029 PFO	

Notes:

4 0

9 ~

- Wetlands with multiple configuous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.

- PEM = Palastine Emergent.

- PEM = Palastine Sund-Smuth.

- PEM = Palastine contest and the permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)

- PEM = Palastine contest and permanent waters (RPWs) that flow directly or indirectly into TNWs

- RPWN = Palastine contest and flow directly or indirectly into TNWs

- RPWN = Palastine contest and flow directly or indirectly into TNWs

- RPWN = Palastine Single-Smuth Pemanent Waters (RPWs) that flow directly or indirectly into TNWs

- RPWN = Palastine Single-Smuth Pemanent Waters (RPWs) that flow directly or indirectly into TNWs

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- RPWN = Palastine Single-Smuth Pemanent Waters (RPWs) that flow directly or indirectly into TNWs

- RPWN = Palastine Single-Smuth Pemanent Waters (RPWs) that flow directly or indirectly into TNWs

- RPWN = Palastine Single-Smuth Pemanent Pema

Table 3. Marshall County County Hydric Soils List Marshall County, West Virginia

		1		
Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
BrB	Brookside silt loam, 3 to 8 percent slopes	Typic Epiaqualfs	5	closed depressions
CaA	Chagrin silt loam, 0 to 3 percent slopes, occasionally flooded	Holly	5	flood plains
CcA	Chagrin silt loam, 0 to 3 percent slopes, protected	Melvin	3	flood plains
CfA	Chagrin-Melvin complex, 0 to 3 percent slopes, frequently flooded	Melvin, frequently flooded	35	backswamps
ChA	Cotaco silt loam, 0 to 3 percent slopes	Melvin, silt loam, occasionally flooded	5	stream terraces
CKA	Cotaco silt loam, 0 to 3 percent slopes, rarely flooded	Melvin	5	flood plains
GfA	Ginat silt loam, 0 to 3 percent slopes	Ginat	80	backswamps
GfA	Ginat silt loam, 0 to 3 percent slopes	pic Epiaqualfs, rarely flooc	8	backswamps
GnB	Glenford silt loam, 3 to 8 percent slopes	Sebring	5	terraces
PuJ	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded	Melvin, occasionally flooded	9	flood plains
PoJ	Lobdell silt loam, 0 to 3 percent slopes, occasionally flooded	Melvin	9	flood plains
LoA	Lobdell silt loam, 0 to 3 percent slopes, occasionally flooded	Holly	- 2	flood plains
MeA	Melvin silt loam, 0 to 3 percent slopes, occasionally flooded	Melvin	80	flood plains
MoB	Monongahela silt loam, 3 to 8 percent slopes	Purdy	2	terraces
OoM	Monongahela silt loam, 8 to 15 percent slopes	Purdy	9	terraces
OmB	Omulga silt loam, 3 to 8 percent slopes	Ginat	2	terraces
Omo	Omulga silt loam, 8 to 15 percent slopes	Ginat	2	terraces
SeA	Sensabaugh silt loam, 0 to 3 percent slopes, occasionally flooded	Melvin	5	flood plains
SkA	Skidmore gravelly loam, occasionally flooded	Melvin, occasionally flooded	3	flood plains
₽ĜL	Taggart silt loam, 3 to 8 percent slopes	Ginat	9	stream terraces
TrA	Taggart silt loam, 0 to 3 percent slopes, rarely flooded	Ginat, rarely flooded	5	stream terraces
AnU	Urban land-Chagrin complex, 0 to 3 percent slopes, rarely flooded	Melvin	3	flood plains
UpA	Urban land-Cotaco complex, 0 to 3 percent slopes	Melvin	2	flood plains
UtA	Urban land-Melvin complex, 0 to 3 percent slopes, rarely flooded	Melvin, rarely flooded, drained	35	backswamps
O^N	Urban land-Omulga complex, 3 to 15 percent slopes	Ginat	2	terraces

Modified from Hydric Soils of the United States (NRCS, 2016)

Table 4. Monroe County Hydric Soils List Monroe County, Ohio

Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
BsD2	Brookside silt loam, 15 to 25 percent slopes, eroded	poorly drained soils	10	hills
Chg1AF	Chagrin silt loam, 0 to 3 percent slopes, frequently flooded	Melvin	7	depressions, flood plains
H	Hartshorn silt loam, wet variant	poorly drained soils	10	depressions
KnL1AF	Kinnick-Lindside silt loams, 0 to 3 percent slopes, frequently flooded	Melvin	9	depressions, flood plains
Lh	Lindside silt loam	poorly drained soils	9	abandoned channels
New1AF	Newark silt loam, 0 to 3 percent slopes, frequently flooded	Melvin	9	flood plains
Nm	Newark silt loam, frequently flooded	Poorly drained soils	15	depressions
Nn	Newark silt loam, 0 to 3 percent slopes, frequently flooded	Melvin, frequently flooded	9	flood plains
No	Newark Variant silt loam, frequently flooded	Poorly drained soils	15	channels
ScB	Sciotoville silt loam, 0 to 4 percent slopes	poorly drained soils	2	closed depressions

Modified from Hydric Soils of the United States (NRCS, 2016)



S-WJKM01 Modified Class 1

Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM01 RIVER BASIN Ohio DRAINAGE AREA (m	ni²) < 0.01
LENGTH OF STREAM REACH (ft) 228 LAT. 39.75272 LONG80.87066 RIVER CODE RIVER M	
DATE 11/06/19 SCORER KMM, WJ COMMENTS Trash and machinery filling in stream valley	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for	Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO *Modified if Checked*	RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE box (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	xes I HHEI
TYPE PERCENT TYPE PERCENT	Metric Points
BLDR SLABS [16 pts]	Politis
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts]	
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] MUCK [3 pts] O% ON ON ON ON ON ON ON ON ON	15
Total of Percentages of 10.00% (A) Substrate Percentage Check (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts]	
Name to the second seco	
COMMENTS No water MAXIMUM POOL DEPTH (centimeters):	0
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] \(\leq 1.0 m (<=3' 3") [5 pts]	Bankfull Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.61 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.61 m AVERAGE BANKFULL WIDTH (meters):	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R	Width Max=30 5
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Width Max=30 5
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30 5
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30 5 age all ow Crop
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30 5 age all ow Crop
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m (<=3' 3") [5 pts] > 1.0	Width Max=30 5 age all ow Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Moderate 5-10m Residential, Park, New Field None COMMENTS Flow Residential, Park, New Field None COMMENTS Flow Residential, Park, New Field None COMMENTS Flow Residential, Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Interm	Width Max=30 5 age all ow Crop uction
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Noist Channel, isolated pools, no flow (Interm	Width Max=30 5 age all ow Crop uction
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH FLOODPLAIN QUALITY Wide >10 m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m None Residential, Park, New Field None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	Width Max=30 5 age all ow Crop uction
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH L R (Per Bank) Wide >10m Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field Open Pasture, Re COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS None Flow Regime (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS None COMMENTS Moist Channel, isolated pools, no flow (Interm Dry channel, no water (Ephemeral)	Width Max=30 5 age all ow Crop uction
> 4.0 meters (> 13') [30 pts]	Width Max=30 5 age all ow Crop uction

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score (If Yes, Att	ach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	Distance from Evaluated Stream 1,177.00 ft.
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	DAREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Powhatan Point NRCS Soil Map	Page: NRCS Soil Map Stream Order
County: Monroe Township / City: Salem	1
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/01/19	Quantity: 1.05
Photograph Information: See Attached Figure 4 and Stream Data Form Photographs	S
Elevated Turbidity? (Y/N): N Canopy (% open): 0%	
Were samples collected for water chemistry? (Y/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) If not, please explain:	
то але сатърния годон горгосов на не са сать (тулу <u>та</u> тоск, рессес охрани	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N (If You Downstian Vousband Heating with	AL NOTE: all courses are also growther labeled with the site.
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional ID number. Include appropriate field data sheets from the Performed?	·
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N)	Voucher? (Y/N)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebra	\ \ '.'./ N
Comments Regarding Biology:	IN .

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):

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



Stream Photograph Page

Stream ID <u>S-WJKM01</u> Date <u>11/06/19</u>



Photograph Number 1
Photograph Direction South

Comments:



Photograph Number 2
Photograph Direction NNE

Comments:



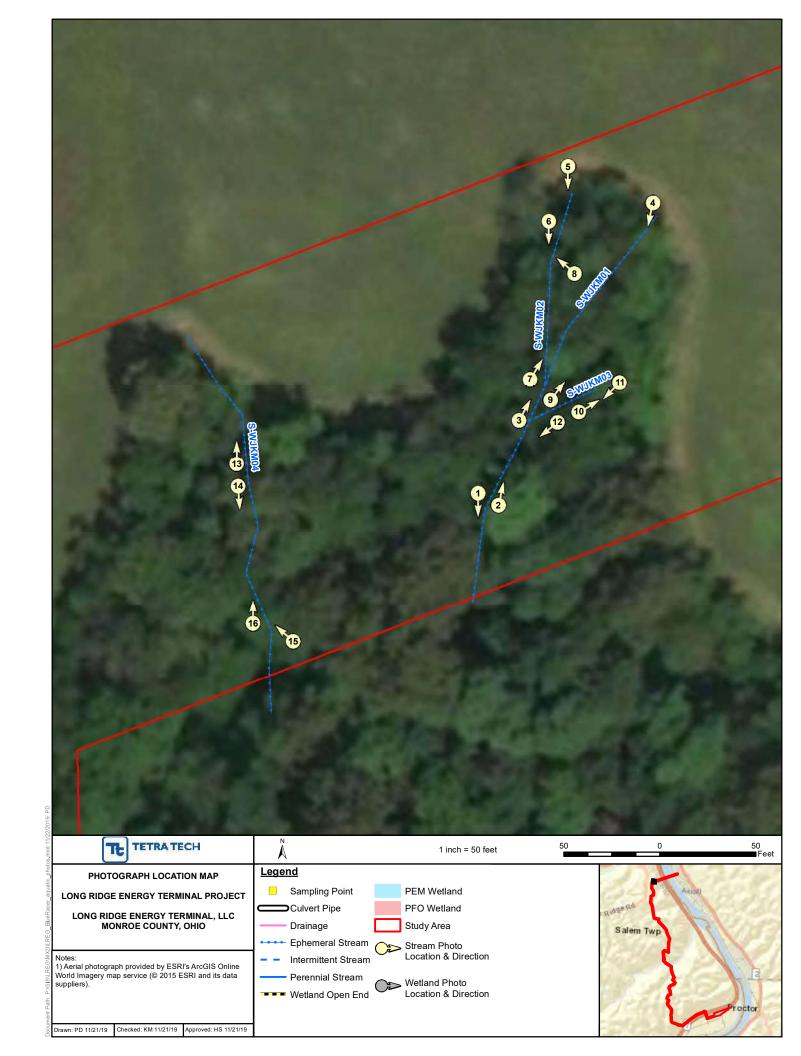
Photograph Number 3
Photograph Direction NE

Comments:



Photograph Number 4
Photograph Direction SSW

Comments:



S-WJKM02 Modified Class 1



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM02 RIVER BASIN Ohio DRAINAGE AREA (mi²)	< 0.01
LENGTH OF STREAM REACH (ft) 104 LAT. 39.75287 LONG80.87065 RIVER CODE RIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS Trash and machinery filling in stream valley	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	ı HHEI
TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate Max = 40
☐ COBBLE (65-256 mm) [12 pts] 5% ☐ CLAY or HARDPAN [0 pt] 40% ☐ GRAVEL (2-64 mm) [9 pts] 10% MUCK [0 pts] 0%	
SAND (<2 mm) [6 pts]	12
Total of Percentages of 5.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock Check SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	0
COMMENTS No water MAXIMUM POOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): 0.30	5
This information <u>must</u> also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\frac{1}{2}\text{NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ NOTE: River Left (R) as looking downstream \$\frac{1}{2}\text{ R}\$.	
RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) L R	
RIPARIAN WIDTH L R (Per Bank) Wide >10m L R (Most Predominant per Bank) Mature Forest, Wetland Conservation Tillage	
RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m PLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Urban or Industrial	
RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R (Conservation Tillage Immature Forest, Shrub or Old Field Open Pasture, Row Cr	.ob
RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m PLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Open Pasture Row Company	·
RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS RESIDENTIAL TO THE PROPERTY OF THE PROP	·
RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Immature Forest, Shrub or Old Immature Forest, Shrub or	1
RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Immature Forest, Shrub or Old Field Narrow <5m None Fenced Pasture COMMENTS FLOW REGIME (At Time of Evaluation) FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R Conservation Tillage Urban or Industrial Open Pasture, Row Cr Mining or Construction COMMENTS	1
RIPARIAN WIDTH (Per Bank) Wide >10m Mature Forest, Wetland Immature Forest, Shrub or Old Immature Forest, Wetland Immature Forest, Shrub or Old Immature Forest, Wetland Immature Forest, New Field Immatu	1
RIPARIAN WIDTH (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field Open Pasture, Row Cr None COMMENTS FLOW REGIME (At Time of Evaluation) COMMENTS Mature Forest, Wetland Conservation Tillage Urban or Industrial Open Pasture, Row Cr Mining or Construction Mining or Construction Comments Moderate 5-10m Comments Open Pasture, Row Cr Mining or Construction Comments Moderate 5-10m Comments Open Pasture, Row Cr Mining or Construction Comments Moderate 5-10m Comments Open Pasture, Row Cr Mining or Construction Comments Moderate 5-10m Comments Open Pasture, Row Cr Mining or Construction Comments Dry channel, isolated pools, no flow (Intermittents) Comments Comments Comments	1
RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Wide >5-10m Narrow <5m Residential, Park, New Field Open Pasture, Row Cr None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) None 1.0 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3	1
RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field Narrow <5m Residential, Park, New Field None COMMENTS FLOW REGIME (At Time of Evaluation) Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) Narrow Company Check ONLY one box): SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 Check ONLY one box): SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 3.0	t)

ADDITIONAL STREAM INFORMATION (This Information Must Als	o be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	Distance from Evaluated Stream 1,207.00 ft.
CWH Name:	51. (5 1 1 1 2
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE E	NTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Powhatan Point	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Town	ship / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/01/19 Quantity: 1.05
Photograph Information: See Attached Figure 4 and Stream Data	Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 09	/ 6
Were samples collected for water chemistry? (Y/N): N (Note la	ab 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)	t, please explain:
Additional comments/description of pollution impacts:	
PIOTIC EVALUATION	
BIOTIC EVALUATION	
· / 	er collections optional. NOTE: all voucher samples must be labeled with the sit
	ta sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders (Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aqua	atic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):

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



Stream Photograph Page

Stream ID <u>S-WJKM02</u> Date <u>11/06/19</u>



Photograph Number <u>5</u>
Photograph Direction South

Comments:



Photograph Number 6
Photograph Direction South

Comments:



Photograph Number 7

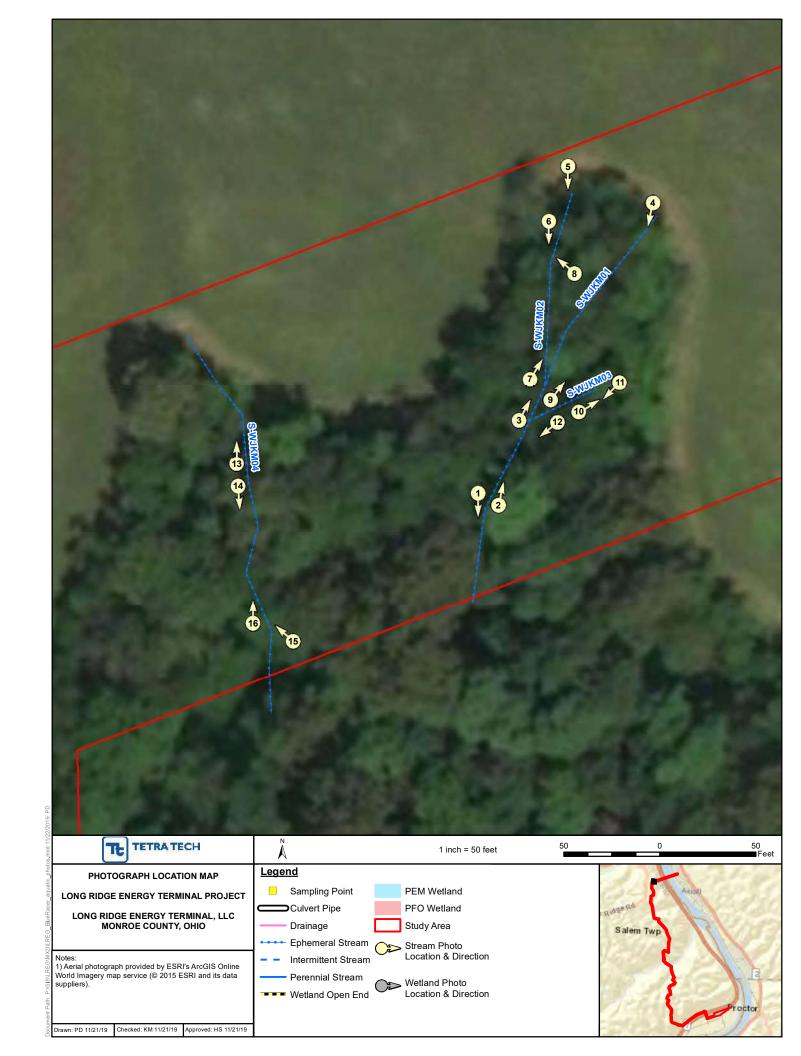
Photograph Direction NE

Comments:



Photograph Number 8
Photograph Direction NW

Comments:



S-WJKM03 Modified Class 1



Chief PA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM03 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.01
LENGTH OF STREAM REACH (ft) 52 LAT. 39.75270 LONG80.87063 RIVER CODE RIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS Trash and machinery filling in stream valley	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions
STREAM CHANNEL	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT □ □ BLDR SLABS [16 pts] 0% □ □ SILT [3 pt] 15%	Metric Points
BOULDER (>256 mm) [16 pts]	Substrate
□ □ BEDROCK [16 pt] □ □ FINE DETRITUS [3 pts] □ 0% □ □ CLAY or HARDPAN [0 pt] 40%	Max = 40
☐ ☐ GRAVEL (2-64 mm) [9 pts] ☐ ☐ MUCK [0 pts] ☐ 0% ☐ ☐ ARTIFICIAL [3 pts] ☐ 0% ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	12
Total of Percentages of 5.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Pool Dep
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts]	\parallel o \parallel
COMMENTS No water MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	WIAX-30
COMMENTS 0.61 m AVERAGE BANKFULL WIDTH (meters): 0.61	₅
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cro	эр
✓ 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) COMMENTS Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	<u> </u>
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0 √ 0.5 1.5 2.5 >3	

ADDITIONAL STREAM INFORMATION (This Information Must Also be Co	mpleted):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	_ Distance from Evaluated Stream
CWH Name: _	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE V	ATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Powhatan Point NRCS	Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Township / C	ty: Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/0	Quantity.
Photograph Information: See Attached Figure 4 and Stream Data Form Ph	otographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 0%	
Were samples collected for water chemistry? (Y/N): (Note lab samples)	e 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) If not, please	explain:
is the sampling reach representative of the stream (1774) in not, please	охрані
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N N	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections)	ions optional. NOTE: all voucher samples must be labeled with the
	from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observe	d? (Y/N) N Voucher? (Y/N) N
riogs of Taupoles Observed? (17/14) N Voucher? (17/14) N Aquatic Mac	oinvertebrates Observed? (Y/N) N Voucher? (Y/N)
Comments Regarding Biology:	

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):

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



Stream ID <u>S-WJKM03</u> Date <u>11/06/19</u>



Photograph Number 9
Photograph Direction ENE

Comments:



Photograph Number 10
Photograph Direction NE

Comments:

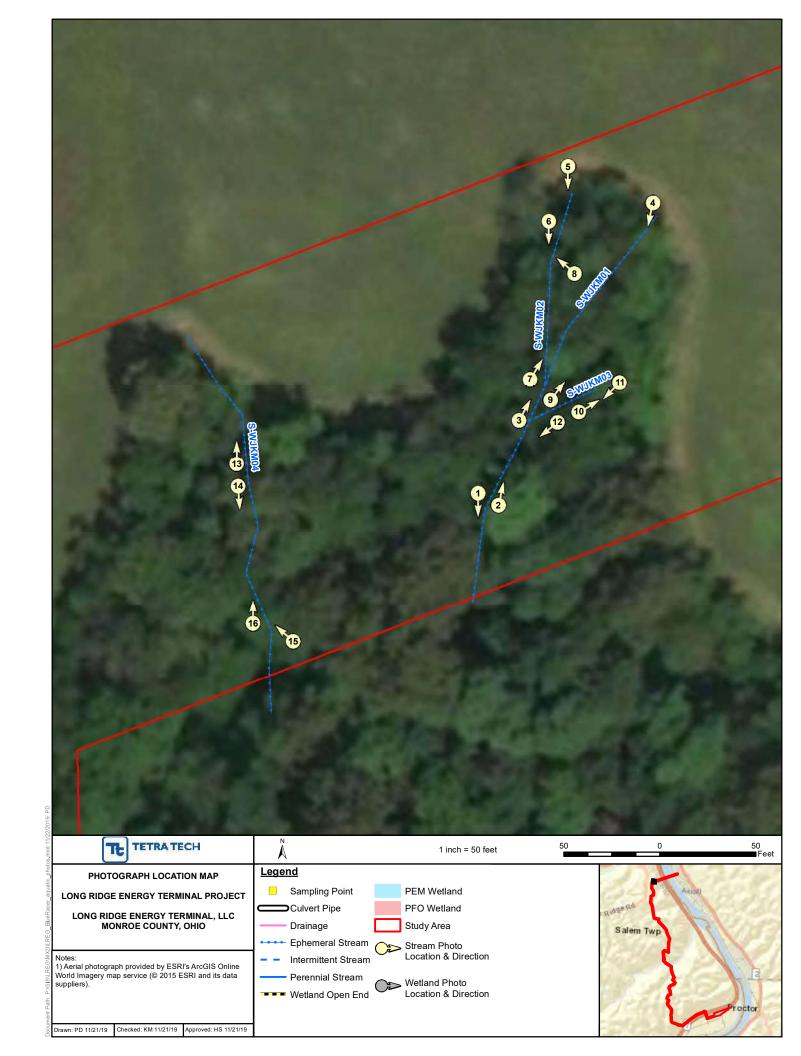


Photograph Number 11
Photograph Direction SW

Comments:



Photograph Number 12
Photograph Direction SW



S-WJKM04	Class	2
	<u> </u>	_



SITE NAME/LOCATION Long Ridge Energy Terminal Project	
	0.01
LENGTH OF STREAM REACH (ft) 207 LAT. 39.75255 LONG80.87120 RIVER CODE RIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt]	Substrat
☐ ☐ COBBLE (65-256 mm) [12 pts] ☐ ☐ CLAY or HARDPAN [0 pt] ☐ ☐ 10%	Max = 4
☐ ☐ GRAVEL (2-64 mm) [9 pts] ☐ MUCK [0 pts] ☐ 0% ☐ ARTIFICIAL [3 pts] ☐ 0% ☐ 0% ☐ 0% ☐ 0% ☐ 0% ☐ 0% ☐ 0% ☐ 0	32
Total of Percentages of 35.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 25 TOTAL NUMBER OF SUBSTRATE TYPES: 7	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 3
	0
	0
COMMENTS No water MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankful Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 1.22 m AVERAGE BANKFULL WIDTH (meters): 1.22	15
COMMENTS 1.22 III AVERAGE BANKFULL WIDTH (meters): 1.22	
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\frac{1}{2}\text{NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}}	
RIPARIAN WIDTH FLOODPLAIN QUALITY L_R_ (Per Bank) _L_R_ (Most Predominant per Bank) _L_R_	
☐☐ Wide >10m ☐☐ Mature Forest, Wetland ☐☐ Conservation Tillage	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial	
✓ ✓ Narrow <5m	pp
None Fenced Pasture Mining or Construction	
COMMENTS	-
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent	
Subsurface flow with isolated pools (Interstitial) COMMENTS Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	_
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0 ✓ 0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/1	00 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Als	so be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	Distance from Evaluated Stream 1,529.00 ft.
CWH Name:	5
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE E	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Powhatan Point	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Town	nship / City: Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/01/19 Quantity: 1.05
Photograph Information: See Attached Figure 4 and Stream Data	Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 0	%
Were samples collected for water chemistry? (Y/N): Note la	ab 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)	ot, please explain:
,	
Additional comments/description of pollution impacts:	
PIOTIC FVALUATION	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Vouch	ner collections optional. NOTE: all voucher samples must be labeled with the site
	ata sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders	Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aqu	atic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-WJKM04</u> Date <u>11/06/19</u>



Photograph Number 13
Photograph Direction North

Comments:



Photograph Number 14
Photograph Direction South

Comments:

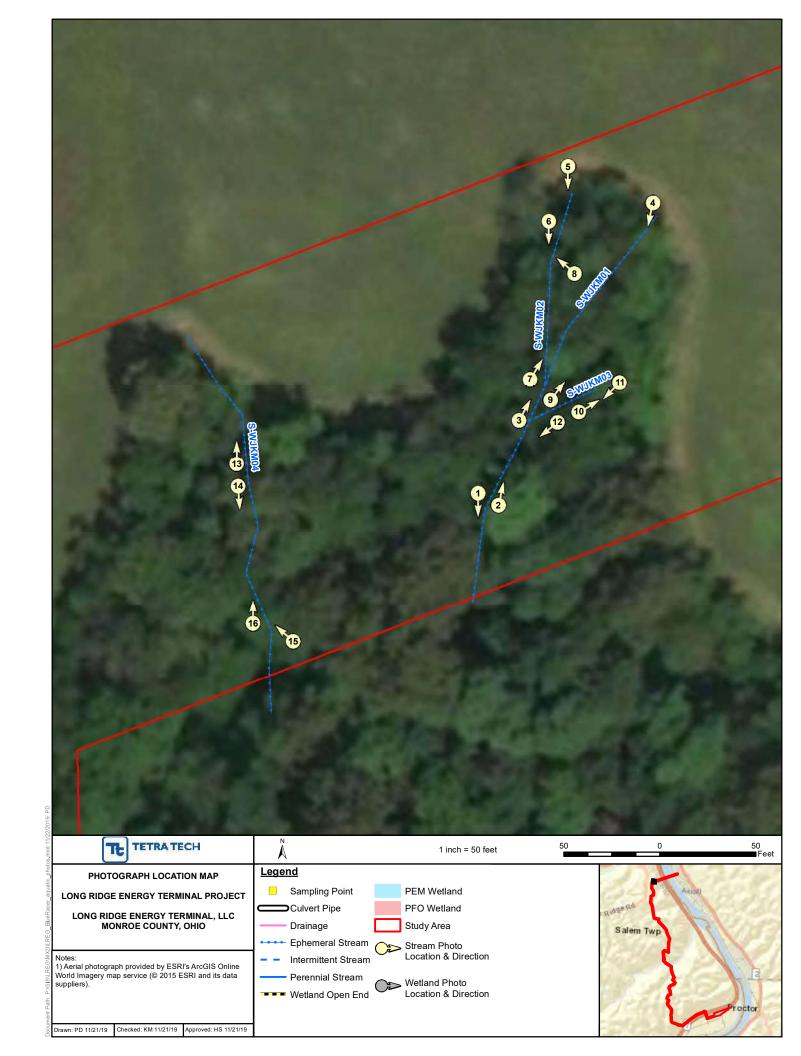


Photograph Number 15
Photograph Direction NW

Comments:



Photograph Number 16
Photograph Direction North



S-WJKM05	Class 2
0-1101/1000	i iviass <i>i</i>



SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM05 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.04
LENGTH OF STREAM REACH (ft) 267 LAT. 39.75155 LONG80.87187 RIVER CODE RIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING: *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHE Metri
TYPE PERCENT TYPE PERCENT □ □ □ BLDR SLABS [16 pts] 0% □ □ □ SILT [3 pt] 15% □	Point
BOULDER (>256 mm) [16 pts]	Substra
BEDROCK [16 pt]	Max = 4
GRAVEL (2-64 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] O MUCK [0 pts]	10
SAND (<2 mm) [6 pts] 25% ARTIFICIAL [3 pts] 0%	12
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10.00% (A) Substrate Percentage Check 100%	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 3
 > 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts] 	25
	25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 13	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfu
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	l
COMMENTS 1.52 m AVERAGE BANKFULL WIDTH (meters): 1.52	20
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m	
Field Field Urban or industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cr	op
None Fenced Pasture Mining or Construction COMMENTS	1
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermitten	t)
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	1
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0 3.0 0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/	100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also	be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	Distance from Evaluated Stream 1,755.00 ft.
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE E	NTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Powhatan Point	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Town	ship / City:Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/01/19 Quantity: 1.05
Photograph Information: See Attached Figure 4 and Stream Data F	Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 0%	6
Were samples collected for water chemistry? (Y/N): N (Note la	b sample no. or id. and attach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y	, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N N	
· /	er collections optional. NOTE: all voucher samples must be labeled with the site
	a sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Salamanders C	Observed? (Y/N) N Voucher? (Y/N) N
Progs of Tadpoles Observed? (1714) N Voucher? (1714) N Aqua	tic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
·	



Stream ID <u>S-WJKM05</u> Date <u>11/06/19</u>



Photograph Number <u>17</u>
Photograph Direction West

Comments:



Photograph Number 18
Photograph Direction East

Comments:

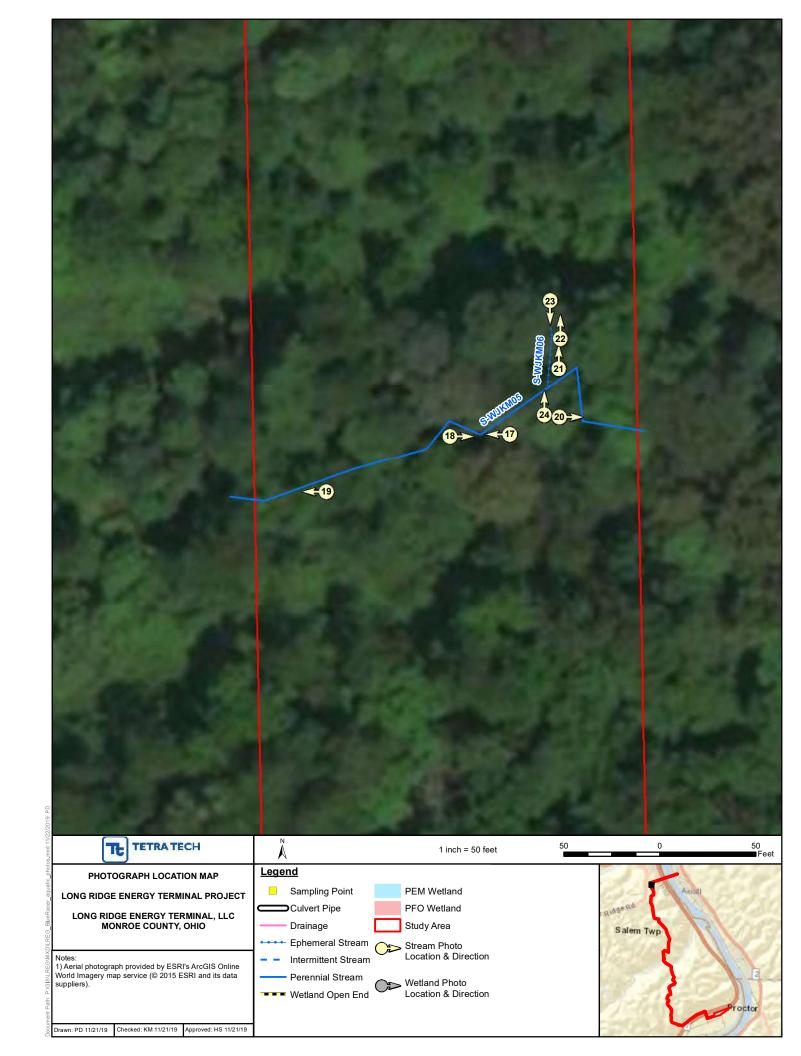


Photograph Number 19
Photograph Direction West

Comments:



Photograph Number 20
Photograph Direction East



S-WJKM06
3-4401/10100

Class 1



SITE NAME/LOCATION LC	ong Ridge Energy Termina	l Project	<u> </u>	
	SITE NUMBER S-WJKM06	RIVER BASIN Ohio	DRAINAG	E AREA (mi²) 0.04
LENGTH OF STREAM REAG	. ,	LONG80.87169	RIVER CODE	RIVER MILE
DATE 11/06/19 SC	ORER KMM, WJ COMM	MENTS		
NOTE: Complete All Ite	ms On This Form - Refer to "	Field Evaluation Manual f	or Ohio's PHWH Strea	ams" for Instructions
STREAM CHANNEL MODIFICATIONS:	NONE / NATURAL CHANN		RECOVERING RECE *Modified if Checked*	
	nate percent of every type of sub-			
<u>TYPE</u>	PERCENT	TYPE		ERCENT Metric
BLDR SLABS [1		SILT [3 pt]	DDY DEBRIS [3 pts]	15% Points
BEDROCK [16		FINE DETRITUS		0% Substrat
COBBLE (65-25	00/	CLAY or HARDPA	N [0 pt]	60% 0%
☐ ☐ GRAVEL (2-64 r	1111) [5 pts]	MUCK [0 pts] ARTIFICIAL [3 pts		0%
Total of Perce		Substrate Percentage	100%	(B) A+B
Bldr Slabs, Boulder, SCORE OF TWO MOST PR	Cobble, Bedrock EDOMINATE SUBSTRATE TYPES	3 TOTAL NUM	BER OF SUBSTRATE TY	PES: 3
2. Maximum Pool Dei	oth (Measure the maximum pool o	denth within the 61 meter (20	00 ft) evaluation reach at t	the time of Pool Dep
evaluation. Avoid plu	unge pools from road culverts or sto	orm wa <u>ter pipes)</u> (Check ON	LY one box):	Max = 30
> 30 centimeters [20 > 22.5 - 30 cm [30 p	• •	> 5 cm - 10 cm [7	15 pts]	
> 10 - 22.5 cm [25 p	ts]		MOIST CHANNEL [0 pts]	O
COMMENTS No	water	MAXIMUM	I POOL DEPTH (centime	eters): 0
3. BANK FULL WIDTH	H (Measured as the average of 3-4	1 measurements) (Ch	neck ONLY one box):	Bankful
> 4.0 meters (> 13') [3 > 3.0 m - 4.0 m (> 9'		> 1.0 m - 1.5 m (3	> 3' 3" - 4' 8") [15 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9'		<u> </u>	[o pto]	
COMMENTS 0.61	m	AVERAGE	BANKFULL WIDTH (me	eters): 0.61 5
DIDADIAN		information must also be cor		
RIPARIAN Z RIPARIAN	ONE AND FLOODPLAIN QUALITY WIDTH FLOODPLA	r SrnOTE: River Leπ (L) a <u>IN QUALITY</u>	and Right (R) as looking d	ownstream 🔀
L R (Per Bank		Most Predominant per Bank)	L R	
∭ Wide >10 ☐ Moderate		lature Forest, Wetland nmature Forest, Shrub or Old		rvation Tillage or Industrial
	—— F	ield	 _	Pasture, Row Crop
Narrow <		esidential, Park, New Field		·
✓ ✓ None COMMENTS		enced Pasture	Mining	or Construction
FLOW REG	IME (At Time of Evaluation) (Chec	k ONLY one box):		
Stream Flowi	ng	Moist Cha	annel, isolated pools, no f	
COMMENTS	ow with isolated pools (Interstitial)	⊔ry chan	nel, no water (Ephemeral	
SINUOSITY	(Number of ben <u>ds</u> per 61 m (200 ft) of channel) <u>(C</u> heck <i>ONLY</i> o	ne box):	
None 0.5	1.0	2.0	3.0	
_				
	TECTIMATE			
STREAM GRADIEN Flat (0.5 ft/100 ft)		te (2 ft/100 ft) Modera	te to Severe	Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Als	so be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Ohio River	Distance from Evaluated Stream 1,872.00 ft.
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: Powhatan Point	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Town	nship / City: Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/01/19 Quantity: 1.05
Photograph Information: See Attached Figure 4 and Stream Data	Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 0	%
Were samples collected for water chemistry? (Y/N): Note I	ab 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)	ot, please explain:
,	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N N	
· /	ner collections optional. NOTE: all voucher samples must be labeled with the site
	ata sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders	Observed? (Y/N) N Voucher? (Y/N) N
Progs of Taupoles Observed? (1714) N Voucher? (1714) N Aqu	atic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-WJKM06</u> Date <u>11/06/19</u>



Photograph Number 21
Photograph Direction North

Comments:



Photograph Number 22
Photograph Direction North

Comments:

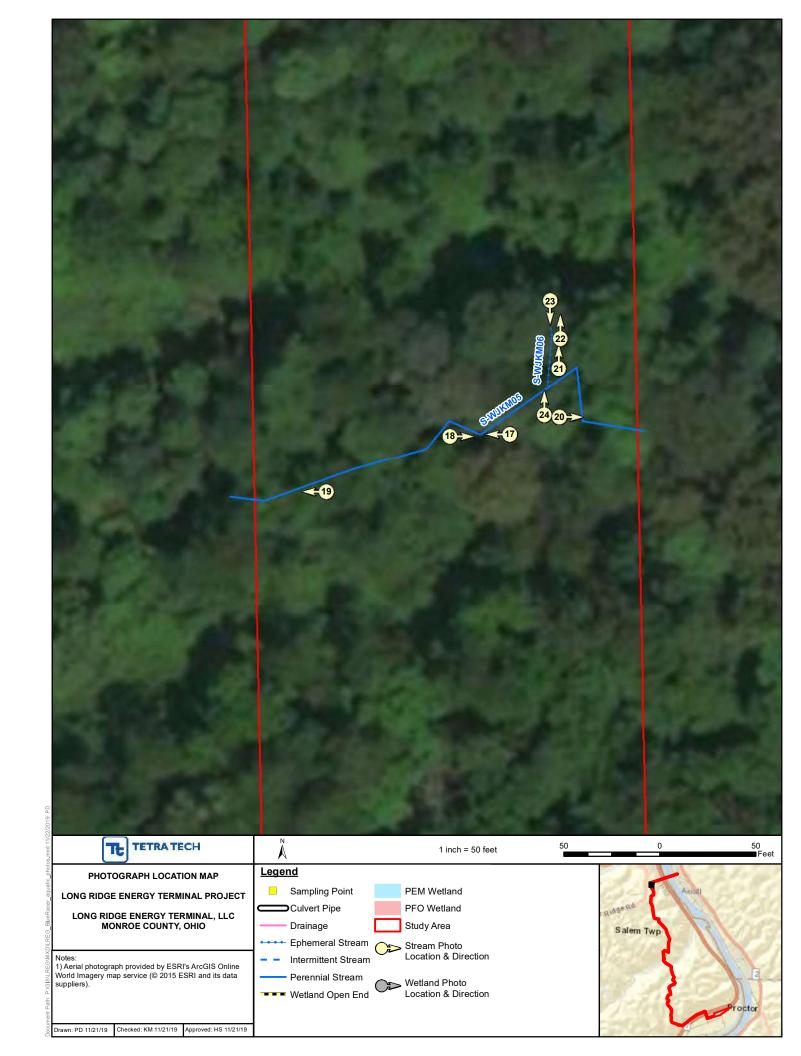


Photograph Number 23
Photograph Direction South

Comments:



Photograph Number 24
Photograph Direction North



S-WJKM07	
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Class 1

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
	< 0.01
LENGTH OF STREAM REACH (ft) 209 LAT. 39.74999 LONG80.87172 RIVER CODERIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	ı HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate
COBBLE (65-256 mm) [12 pts]	Max = 40
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts] 0%	8
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock Check TOTAL NUMBER OF SUBSTRATE TYPES: 5	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
	0
COMMENTS NO Water MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful Width
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Bankful Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 4.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.46 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.46 m AVERAGE BANKFULL WIDTH (meters):	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ★ RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.46 m AVERAGE BANKFULL WIDTH (meters): 0.46 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY % NOTE: River Left (L) and Right (R) as looking downstream % RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R (Most Predominant	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.46 m AVERAGE BANKFULL WIDTH (meters): 0.46 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream And RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) Wide >10 m Mature Forest, Wetland Moderate 5-10m Mature Forest, Wetland Moderate 5-10m Residential, Park, New Field Open Pasture, Row Completed Narrow <5m Residential, Park, New Field Open Pasture, Row Completed RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) Moderate 5-10m Residential, Park, New Field Open Pasture, Row Completed Narrow <5m Residential, Park, New Field Open Pasture, Row Completed FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermitten)	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY XNOTE: River Left (L) and Right (R) as looking downstream X RIPARIAN WIDTH FLOODPLAIN QUALITY Whost Predominant per Bank) Wide > 10m Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream → RIPARIAN WIDTH FLOODPLAIN QUALITY Wide >10 Moderate 5-10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m None Fenced Pasture COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS None (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS None (Check ONLY one box): Dry channel, isolated pools, no flow (Intermitten Dry channel, no water (Ephemeral))	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field Penced Pasture COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.	Width Max=30 5

ADDITIONAL STREAM INFORMATION (This Information Must Also be Com	ppleted):	
QHEI PERFORMED? - Yes V No QHEI Score (I	f Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Ohio River	Distance from Evaluated Stream 1,935.00 ft.	
CWH Name:	Distance from Evaluated Stream	
EWH Name:	Distance from Evaluated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WA	TERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: Powhatan Point NRCS	Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Township / City	Salem	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_ 11/01	Quality.	
Photograph Information: See Attached Figure 4 and Stream Data Form Photograph Information:	tographs.	
Elevated Turbidity? (Y/N): N Canopy (% open): 0%		
Were samples collected for water chemistry? (Y/N): Note lab sample	no. or id. and attach results) Lab Number:	
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pl	H (S.U.) Conductivity (µmhos/cm)	
Is the sampling reach representative of the stream (Y/N) If not, please e	xplain:	
is the sampling reach representative of the saleam (1774) in not, please of	дин. <u> </u>	
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N		
Performed? (Y/N): (If Yes, Record all observations. Voucher collection	ns optional. NOTE: all voucher samples must be labeled with the	
	rom the Primary Headwater Habitat Assessment Manual)	
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed?	Youcher? (Y/N)	
riogs of Taupoles Observed? (1714) N Voucher? (1714) N Aquatic Macio	invertebrates Observed? (Y/N) Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>s-wJкмо7</u> Date <u>11/06/19</u>



Photograph Number 25
Photograph Direction SW

Comments:



Photograph Number <u>26</u>
Photograph Direction <u>NE</u>

Comments:

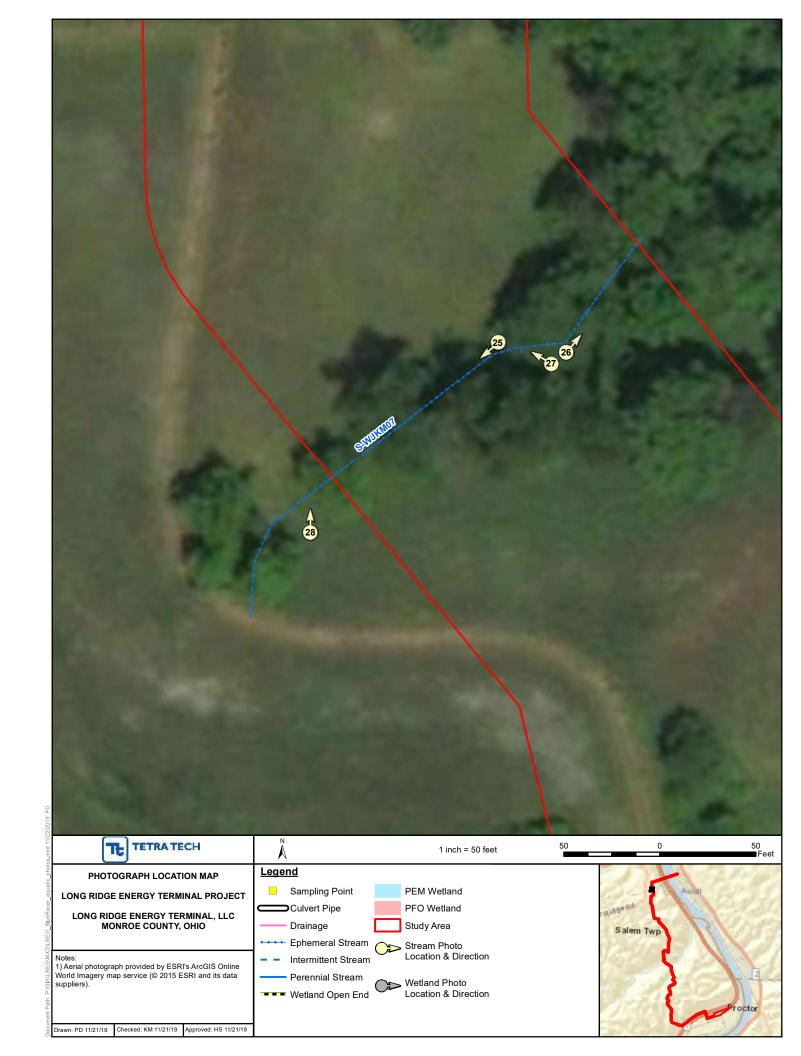


Photograph Number 27
Photograph Direction NW

Comments:



Photograph Number 28
Photograph Direction North



Class 3



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

78

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM08 RIVER BASIN Ohio DRAINAGE AREA (mi²)	.12
LENGTH OF STREAM REACH (ft) 304 LAT. 39.74249 LONG80.87082 RIVER CODE RIVER MILE	
DATE 11/06/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (May of 20) Add total purple of significant with strate type found (May of 2). Final matrix access is a way of house A & B.	HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] 20% SILT [3 pt] LEAF PACK/WOODY DEBRIS [3 pts] 0%	Points
BEDROCK [16 pt] BEDROCK [16 pt] 30% FINE DETRITUS [3 pts] 0%	Substrate
COBBLE (65-256 mm) [12 pts] 15% CLAY or HARDPAN [0 pt] 0%	Max = 40
□ □ GRAVEL (2-64 mm) [9 pts] 5% □ □ MUCK [0 pts] 0% □ □ SAND (<2 mm) [6 pts]	38
Total of Percentages of 80.00% (A) Substrate Percentage 100% (B) Check	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 32 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts]	20
	20
COMMENTS MAXIMUM POOL DEPTH (centimeters): 40	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (< 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS AVERAGE BANKFULL WIDTH (meters): 2.44	20
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY	
LR (Per Bank) LR (Most Predominant per Bank) LR	
Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old	
Field Field	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cro	ıp
None Fenced Pasture Mining or Construction COMMENTS	_
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	-
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
■ None ■ 1.0 ■ 2.0 ■ 3.0 ■ 0.5 ■ 1.5 ■ 2.5 ■ >3	
STREAM GRADIENT ESTIMATE	
Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/10	

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):			
QHEI PERFORMED? - Yes No QHEI Score 70.0 (If Yes, Attach Completed QHEI Form)			
DOWNSTREAM DESIGNATED USE(S)			
WWH Name: Ohio River Distance from Evaluated Stream 3,452.00 ft.			
CWH Name: _	_ Distance from Evaluated Stream _		
EWH Name:	Distance from Evaluated Stream		
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WAT	TERSHED AREA. CLEARLY MARK THE SITE LOCATION		
USGS Quadrangle Name: New Martinsville NRCS S	oil Map Page: NRCS Soil Map Stream Order		
County: Monroe Township / City:	Salem		
MISCELLANEOUS			
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_ 11/01/	19 Quantity: 1.05		
Photograph Information: See Attached Figure 4 and Stream Data Form Photographs.			
Elevated Turbidity? (Y/N): N Canopy (% open): 0%			
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) If not, please explain:			
is the sampling reach representative of the stream (Y/N) if not, please explain:			
Additional comments/description of pollution impacts:			
Additional commons/accomption of policial impacts.			
DIOTIC EVALUATION			
BIOTIC EVALUATION			
Performed? (Y/N): (If Yes, Record all observations. Voucher collection	s optional. NOTE: all voucher samples must be labeled with the sit		
ID number. Include appropriate field data sheets fro	om the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroir	(Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N)		
Comments Regarding Biology:			



Stream ID <u>S-WJKM08</u> Date <u>11/06/19</u>



Photograph Number 29
Photograph Direction West

Comments:



Photograph Number 30
Photograph Direction NW

Comments:

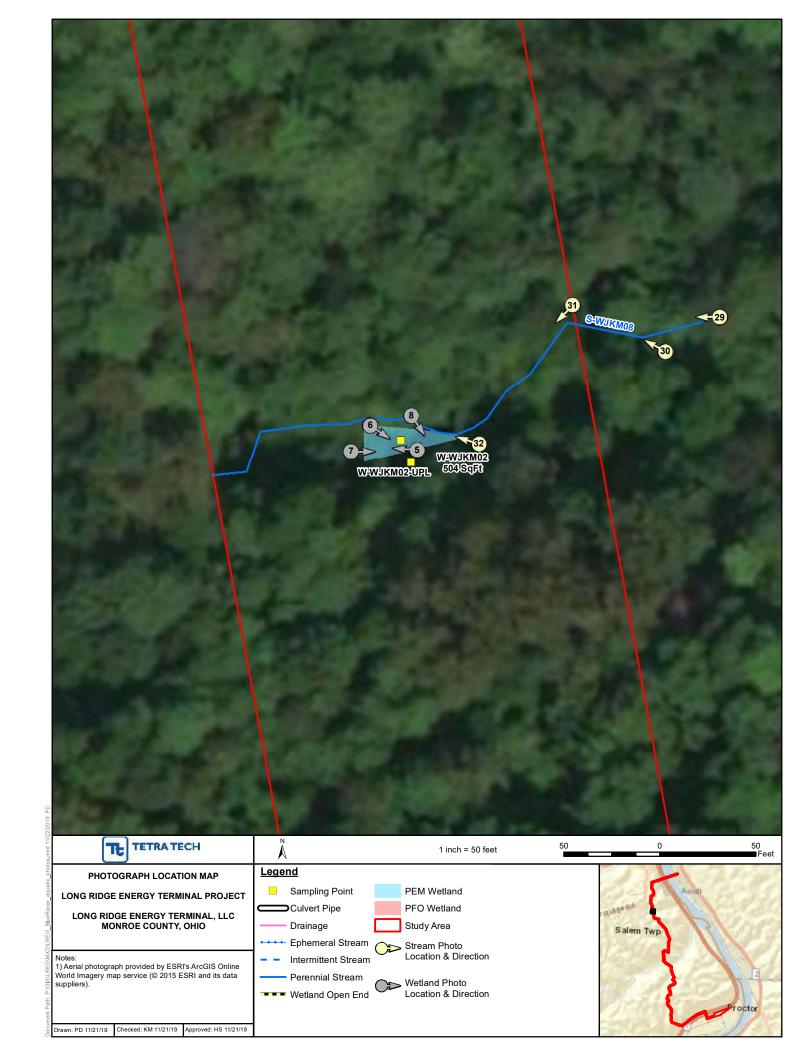


Photograph Number 31
Photograph Direction SW

Comments:



Photograph Number 32
Photograph Direction WNW





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:	70.0
- (

Stream & Location:	S-WJKM08 (Bishop Run)	_ <i>RM:</i>	<i>Date:</i> 11/07/2019
	Scorers Full Name & Affiliation		
River Code:	STORET #: Lat./ Long.: 39.742491, -80	0.870818	Office verified location ✓
1] SUBSTRATE Checestim BEST TYPES BEDR /SLABS [10] BOULDER [9] COBBLE [8] GRAVEL [7]	POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN	ONE (Or 2 &	QUALITY HEAVY [-2] MODERATE [-1] Substrate NORMAL [0]
□□ SAND [6] □□ BEDROCK [5] NUMBER OF BEST Comments	20% 10%		□ EXTENSIVE [-2] □ MODERATE [-1] □ NORMAL [0] □ NONE [1]
quality; 3 -Highest quality	EGETATION [1] ROOTWADS [1] AQUATIC MACROPHY	s of highest er, large al pools. ERS [1] YTES [1]	AMOUNT Check ONE (Or 2 & average) EXTENSIVE >75% [11] MODERATE 25-75% [7] SPARSE 5-<25% [3] NEARLY ABSENT <5% [1] Cover Maximum 20 13.0
31 CHANNEL MORPI	HOLOGY Check ONE in each category (Or 2 & average)		
SINUOSITY DE	VELOPMENT CHANNELIZATION STABILITY		
 ✓ MODERATE [3] ✓ LOW [2] 	EXCELLENT [7]	1	Channel Maximum 20
41 BANK EROSION	AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank	(& average)
River right looking downstre REROSION NONE / LITTLE [3] MODERATE [2] HEAVY / SEVERE [1]	RIPARIAN WIDTH RIPARIAN WIDTH	ITY R	CONSERVATION TILLAGE [1] URBAN OR INDUSTRIAL [0] MINING / CONSTRUCTION [0] e predominant land use(s)
Comments	□ □ NONE [0] □ OPEN PASTURE, ROWCROP [0]] past 10	00m riparian. Riparian Maximum 10
5] POOL / GLIDE AN MAXIMUM DEPTH Check ONE (ONLY!) ☐ > 1m [6] ☐ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]	ND RIFFLE / RUN QUALITY CHANNEL WIDTH Check ONE (Or 2 & average) POOL WIDTH > RIFFLE WIDTH [2] POOL WIDTH > RIFFLE WIDTH [1] POOL WIDTH > RIFFLE WIDTH [1] POOL WIDTH > RIFFLE WIDTH [1] MODERATE [1] Indicate for reach - pools and reach -] TIAL [-1] TTENT [-2] 1]	Recreation Potential Primary Contact Secondary Contact (circle one and comment on back) Pool / Current
Comments			Maximum 12
Indicate for function of riffle-obligate RIFFLE DEPTH BEST AREAS > 10cm [BEST AREAS 5-10cm [BEST AREAS < 5cm [metric=omments	RUN DEPTH RIFFLE / RUN SUBSTRATE RIF 2] MAXIMUM > 50cm [2] STABLE (e.g., Cobble, Boulder) [2] 1] MAXIMUM < 50cm [1] MOD. STABLE (e.g., Large Gravel) [1] UNSTABLE (e.g., Fine Gravel, Sand) [0]	··· FLE / RU □ N □ L	
6] GRADIENT (DRAINAGE AREA	ft/mi)) %GLIDI)%RIFFLI	6.0 II

AJ SAMPLED REACH Check ALL that apply	Comment RE: Reach consistency/ I	s reach typical of steam?, <i>Recreation</i>	// Observed - Inferred, Other/	Comment RE: Reach consistency/Is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.	ess directions, etc.
<u>Q</u>					
<u> </u>					
☐ L. LINE ☐ UP ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
DISTANCE DRY					
CLARITY	B] AESTHETICS	DJ MAINTENANCE	Circle some & COMMENT	EJ ISSUES	F] MEASUREMENTS
1stsample pass 2nd	☐ NUISANCE ALGAE	PUBLIC / PRIVATE / BOTH / NA		WWTP / CSO / NPDES / INDUSTRY	x width 12'
	☐ INVASIVE MACROPHYTES	ACTIVE / HISTORIC / BOTH / NA		HARDENED/URBAN/DIRT&GRIME	x depth 2'
☐ OTHER ☐ 40-70 cm	☐ EXCESS ISINGIBILI	SPRAY / SNAG / REMOVED		BMPs-CONSTRUCTION-SEDIMENT	max. depth
□ > 70 cm/ CTB □ > 70 cm/ CTB □ SECCHI DEPTH	☐ FOAM / SCUM	MODIFIED / DIPPED OUT / NA		LOGGING / IRRIGATION / COOLING	bankfull x depth 5"
JPY 1st	□ [3	RELOCATED / CUTOFFS		FALSE BANK / MANURE / LAGOON	W/D ratio
SSEC	ш	MOVING-BEDLOAD-STABLE		WASH H ₂ 0 / TILE / H ₂ 0 TABLE	bankfull max. depth
Snd	cm ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS	ARMOURED / SLUMPS ISLANDS / SCOURED		ACID / MINE / QUARRY / FLOW NATURAL / WETLAND / STAGNANT	noodprone x width entrench, ratio
	CJ RECREATION AREA DEPTH	IMPOUNDED / DESICCATED		PARK / GOLF / LAWN / HOME	Legacy Tree:
☐ <10%- CLOSED	<i>POOL</i> : □>100ft² □>3ft	ברסם ססורוטבי, בייטיייטבי		י וויסטר ויכירט / באים ויססורוס	

Stream Drawing:

S-WJKM09	CI
3-VVUIXIVIU3	

Class	: 1
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SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM09 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.01
LENGTH OF STREAM REACH (ft) 49 LAT. 39.73569 LONG80.86489 RIVER CODERIVER MILE	
DATE 11/07/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT	Metric Points
BLDR SLABS [16 pts]	
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts]	Substrate Max = 40
☐ COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 60% ☐ GRAVEL (2-64 mm) [9 pts] ☐ MUCK [0 pts] 0%	
GRAVEL (2-64 mm) [9 pts] 10% MUCK [0 pts] 0% SAND (<2 mm) [6 pts] 10% ARTIFICIAL [3 pts] 0%	8
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock	, A - 2
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Pool Dep Max = 3
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts]	₅
COMMENTS 1.25 cm - raining during assessment MAXIMUM POOL DEPTH (centimeters): 1	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankful Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Max=30
COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): 0.30	5
AVERAGE BARRI GEE WIDTH (INELEIS).	
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\sqrt{NOTE}\$: River Left (L) and Right (R) as looking downstream \$\sqrt{x}\$	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Field	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cro	эр
None Fenced Pasture Mining or Construction	
COMMENTS	-
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)
Subsurface flow with isolated pools (Interstitial) COMMENTS_ Dry channel, no water (Ephemeral)	L
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
□ None □ 1.0 □ 2.0 □ 3.0 □ 3.0 □ 1.5 □ 2.5 □ >3	
STREAM GRADIENT ESTIMATE	

ADDITIONAL STREAM INFORMATION (This Information Must Al	so be Completed):		
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)			
WWH Name: Oppossum Creek	Distance from Evaluated Stream 1,083.00 ft.		
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: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order		
County: Monroe Tow	nship / City:Salem		
MISCELLANEOUS			
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/07/19 Quantity: 0.44		
Photograph Information: See Attached Figure 4 and Stream Data Form Photographs.			
Elevated Turbidity? (Y/N): N Canopy (% open): 0%			
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) If not, please explain:			
If the sampling reach representative of the stream (17/1) in not, please explain.			
Additional comments/description of pollution impacts:			
RIOTIC EVALUATION			
BIOTIC EVALUATION			
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit			
	ata sheets from the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqu	Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)		
Comments Regarding Biology:			
·			



Stream ID <u>S-WJKM09</u> Date <u>11/07/19</u>



Photograph Number 33

Photograph Direction West

Comments:



Photograph Number 34
Photograph Direction SW

Comments:

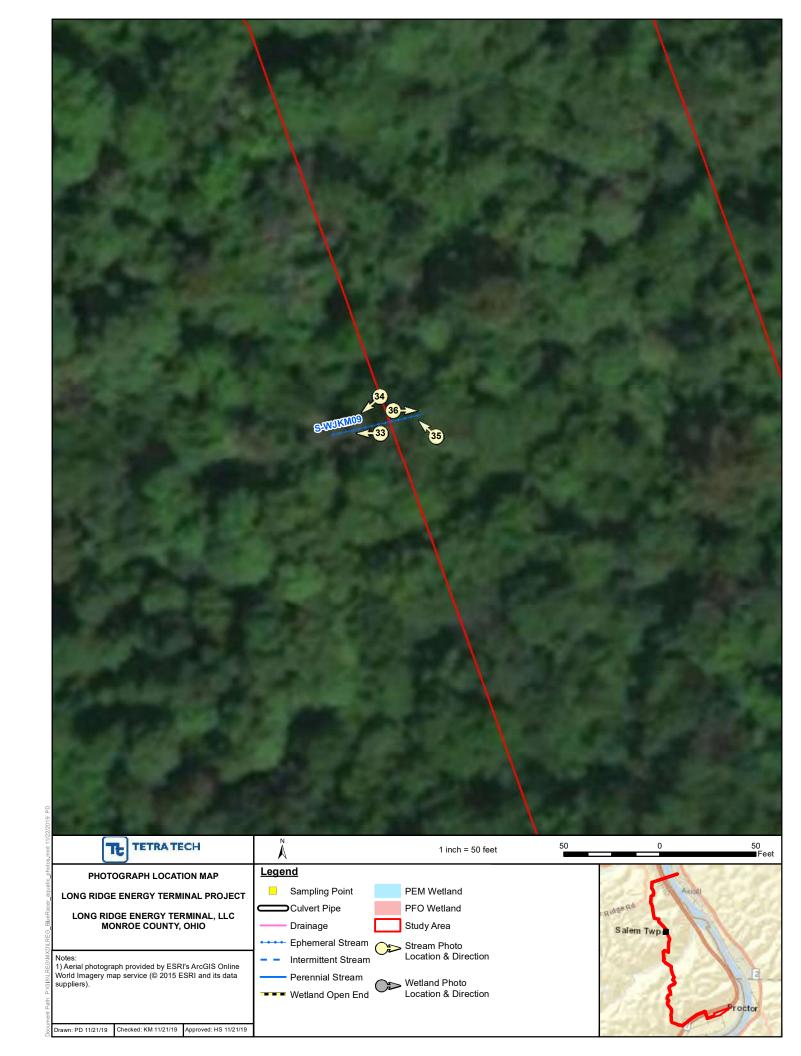


Photograph Number 35
Photograph Direction NW

Comments:



Photograph Number 36
Photograph Direction East



S-WJKM10	Clas
0-110111111	Ulus

SITE NAME/LOCATION Long Ridge Energy Terminal Project		
SITE NUMBER S-WJKM10 RIVER BASIN Ohio DRAINAGE AREA (mi²)	49	
LENGTH OF STREAM REACH (ft) 275 LAT. 39.73121 LONG80.86357 RIVER CODE RIVER MILE		
DATE 11/07/19 SCORER KMM, WJ COMMENTS Moderate rianfall during surveys		
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions	
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI	
TYPE PERCENT TYPE PERCENT □ □ □ BLDR SLABS [16 pts] 5% □ □ □ SILT [3 pt] 0%	Metric Points	
BOULDER (>256 mm) [16 pts] 20% LEAF PACK/WOODY DEBRIS [3 pts] 5%	Substrate	
✓ □ BEDROCK [16 pt] 50% □ FINE DETRITUS [3 pts] 0% □ COBBLE (65-256 mm) [12 pts] 5% □ CLAY or HARDPAN [0 pt] 0%	Max = 40	
GRAVEL (2-64 mm) [9 pts] 10% MUCK [0 pts] 0%	39	
SAND (<2 mm) [6 pts]		
Total of Percentages of 80.00% (A) Substrate Percentage 100% (B)	A + B	
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 32 TOTAL NUMBER OF SUBSTRATE TYPES: 7		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept	
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30	
	20	
COMMENTS MAXIMUM POOL DEPTH (centimeters): 45		
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width	
✓ > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Max=30	
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
COMMENTS AVERAGE BANKFULL WIDTH (meters): 6.10	30	
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆		
RIPARIAN WIDTH FLOODPLAIN QUALITY		
<u>L_R</u> (Per Bank) <u>L_R</u> (Most Predominant per Bank) <u>L_R</u>		
Wide >10m Mature Forest, Wetland Conservation Tillage		
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial		
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Field Open Pasture Row Crr	p	
Moderate 5-10m Immature Forest, Shrub or Old Field V V Narrow < 5m Residential, Park, New Field Open Pasture, Row Cro	þ	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Field Open Pasture Row Crr	þ	
Moderate 5-10m Immature Forest, Shrub or Old Field V Narrow <5m None Immature Forest, Shrub or Old Field Urban or Industrial Open Pasture, Row Cro Penced Pasture Mining or Construction	qi	
Moderate 5-10m Immature Forest, Shrub or Old Field V Narrow <5m Residential, Park, New Field None COMMENTS FLOW REGIME (At Time of Evaluation) Stream Flowing Moderate 5-10m V Immature Forest, Shrub or Old Field Urban or Industrial Open Pasture, Row Cro Mining or Construction Mining or Construction Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)		
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial		
Moderate 5-10m Immature Forest, Shrub or Old		
Moderate 5-10m Immature Forest, Shrub or Old		
Moderate 5-10m		
Moderate 5-10m Immature Forest, Shrub or Old		

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - Yes No QHEI Score 70.0 (If Yes, Atta	ach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Opossum Creek	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	D AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Martinsville NRCS Soil Map F	Page: NRCS Soil Map Stream Order
County: Monroe Township / City: Salem	
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_ 11/07/19	Quantity: 0.44
Photograph Information: See Attached Figure 4 and Stream Data Form Photographs.	
Elevated Turbidity? (Y/N): N Canopy (% open): 0%	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id.	and attach results) Lab Number:
	Conductivity (µmhos/cm)
	, , , <u></u>
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional ID number. Include appropriate field data sheets from the Pr	
N N	N
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebra	Voucher? (Y/N) Voucher? (Y/N) N
Comments Regarding Biology:	



Stream ID S-WJKM10 Date 11/07/19



Photograph Number 37
Photograph Direction North

Comments:



Photograph Number <u>38</u>
Photograph Direction NNW

Comments:

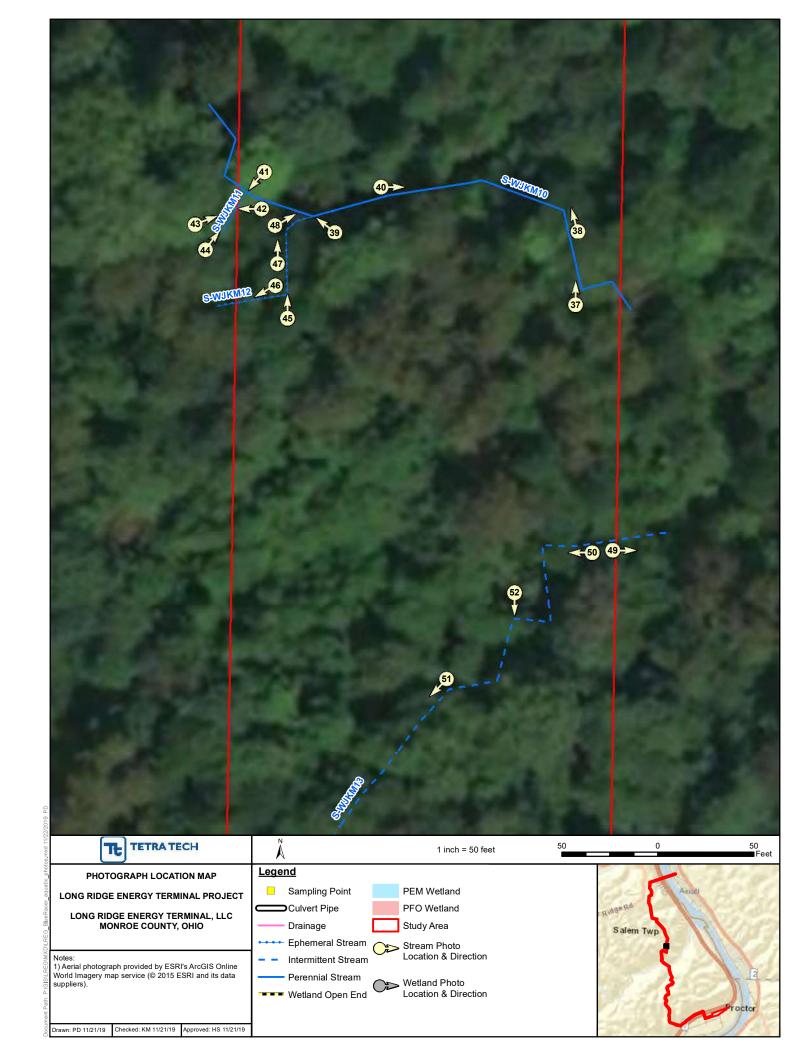


Photograph Number 39
Photograph Direction NW

Comments:



Photograph Number 40
Photograph Direction East





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:	70.0
- · · · · ·	

Stream & Location: S-WJKM10 (Gilmore Run)	<i>RM: Date:</i> 11/07/2019)
	Affiliation: Korey McCluskey, Wyatt Jackson	
	39.73121, -80.86357 Office verified location	ed on ☑
1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE OTHER TYPES	Check ONE (Or 2 & average) PRIGIN QUALITY	
BLDR /SLABS [10] 15% 25%	LANDS [0] DPAN [0] DSTONE [0] RAP [0] USTURINE [0] USTURINE [0] USTURINE [0] LE [-1] L FINES [-2]	3.0
	co or fast water, large eled, functional pools. Check ONE (Or 2 & average) EXTENSIVE >75% [11]	
	20	,.0
☐ HIGH [4] ☐ EXCELLENT [7] ☐ NONE [6] ☐ HIG	ABILITY GH [3] DDERATE [2] DW [1] Channel Maximum 20	6.0
EROSION	AIN QUALITY	
Comments	Maximum 10	3.0
☐ 0.4-<0.7m [2] ☐ POOL WIDTH > RIFFLE WIDTH [0] ☐ FAST [1]	that apply SLOW [1] INTERSTITIAL [-1] INTERMITTENT [-2] EDDIES [1] Primary Contact Secondary Contact (circle one and comment on back)	0.0
Indicate for functional riffles; Best areas must be large enough to of riffle-obligate species: Check ONE (Or 2 & average). RIFFLE DEPTH RUN DEPTH RIFFLE / RUN SUBSTRA	<u> </u>	<u>c=0]</u>
 ☑ BEST AREAS > 10cm [2] ☐ MAXIMUM > 50cm [2] ☑ STABLE (e.g., Cobble, Boulde of the companies of the co	er) [2]	5.0
Comments	EXTENSIVE [-1] Run Maximum 8	
6] GRADIENT (ft/mi) □ VERY LOW - LOW [2-4] %POO DRAINAGE AREA (mi²) □ HIGH - VERY HIGH [6-10] %RUN	Maximum 6.0	.0

Aj SAMPLED REACH Check ALL that apply METHOD STAGE 1st -sample pass-2nd WADE U. LINE U. LINE U. LINE U. LINE U. LINE U. LINE U. LOW U. STANC U. LINE U. LINE U. LOW U. LOW U. STANC U. UNP U. LINE U. LOW U. STANC U. UNP U. LINE U. ON U. STANC U. UNP U. LINE U. LOW U. STANC U. UNP U. LINE U. CO U. CO U. STANC U. LINE U. LINE U. LOW U. CO U. CO U. CO U. STANC U. LOW U. LOW U. CO U. C	Comment RE: Reach consistency/ Is BJAESTHETICS INVASIVE MACROPHYTES EXCESS TURBIDITY DISCOLORATION OIL SHEEN	DJ MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED	n/Observed - Inferred, Other/ Circle some & COMMENT	Comment RE: Reach consistency/ Is reach typical of steam?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc. BJ AESTHETICS DJ MAINTENANCE NUSANCE ALGAE DI MAINTENANCE OINTENANCE OINTENANCE DI MAINTENANCE OINTENANCE OINTENANCE	FJ MEASUREMENTS \overline{x} width 25' \overline{x} depth 4' max. depth \overline{x} bankfull width 20' bankfull \overline{x} depth 1.17'
EN ses of		RELOCATED / CUTOFFS MOVING-BEDLOAD-STABLE ARMOLIRED / SI LIMPS		FALSE BANK / MANURE / LAGGON WASH H ₂ 0 / TILE / H ₂ 0 TABLE ACID / MINF / OILARRY / FLOW	W/D ratio bankfull max. depth floodprone x ² width
☐ 55%~485% 2nd ci ☐ 30%~455% CJ RECR ☐ 10%~430% CJ RECR	Cm CSOS/SSOS/OUTFALLS CJ RECREATION AREA DEPTH POOL: □ >100ft² □ >3ft	INTO DESICCATED INTO DESICCATED ELOOD CONTROL / DRAINAGE		NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY	entrench. ratio Legacy Tree:

Stream Drawing:

S-WJKM11	Class 1

SITE NAME/LOCATION Long Ridge Energy Terminal Project SITE NUMBER S-WJKM11 RIVER BASIN Ohio DRAINAGE AREA (mi²) 0.5	
	52
LENGTH OF STREAM REACH (ft) 24 LAT. 39.73119 LONG80.86390 RIVER CODE RIVER MILE	
DATE 11/07/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	ıctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECO *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt] BEDROCK [16 pt] D BEDROCK [16 pt]	Substrat Max = 40
COBBLE (65-256 mm) [12 pts]	IVIAX - 41
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts]	16
Total of Percentages of 30.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 7	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 3
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS 5 cm - raining during assessment MAXIMUM POOL DEPTH (centimeters): 5	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	
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] (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] \(\leq 1.0 m (<=3' 3") [5 pts]\)	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ (<=3' 3") [5 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY FLOODPLAIN QUALITY	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) Mature Forest, Wetland Conservation Tillage	Width Max=30
> 4.0 meters (> 13') [30 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ★ RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) Wide >10m Moderate 5-10m Moderate 5-10m Noderate 5-10m	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE (Per Bank) L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Noderate 5-10m Noderate Source Planking Conservation Tillage Immature Forest, Shrub or Old Field Onen Pasture Row Crop	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Open Pasture, Row Crop None COMMENTS	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Fenced Pasture Flow REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Noist Channel, isolated pools, no flow (Intermittent)	Width Max=30
> 4.0 meters (> 13') [30 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS 0.30 m AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream And RIPARIAN WIDTH L R (Per Bank) Wide > 10 m Mature Forest, Wetland Moderate 5-10 m Moderate 5-10 m Moderate 5-10 m Residential, Park, New Field Open Pasture, Row Crop None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) P > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS O.30 m AVERAGE BANKFULL WIDTH (meters): O.30 m FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A (meters): O.30 m AVERAGE BANKFULL WIDTH (meters): O.30 m AVERAG	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (≈ 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (≈ 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH FLOODPLAIN QUALITY Wide > 10 m Mature Forest, Wetland Moderate 5-10m Mature Forest, Wetland Moderate 5-10m Narrow < 5m Narrow < 5m Residential, Park, New Field Open Pasture, Row Crop Flow REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must A	lso be Completed):
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
/ WWH Name: Gilmore Run	Distance from Evaluated Stream 13.00 ft.
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: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Tou	wnship / City:Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/07/19 Quantity: 0.44
Photograph Information: See Attached Figure 4 and Stream Dat	a Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
Were samples collected for water chemistry? (Y/N): N (Note	lab sample no. or id. and attach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y	not, please explain:
Additional comments/description of pollution impacts:	
Additional commonts decomption of political impacts.	
PIOTIO FVALUATION	
BIOTIC EVALUATION	
· /	cher collections optional. NOTE: all voucher samples must be labeled with the site
	data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders	s Observed? (Y/N) N Voucher? (Y/N) N
riogs of Taupoles Observed? (17/N) N Voucher? (17/N) N Ad	uatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-WJKM11</u> Date <u>11/07/19</u>



Photograph Number <u>41</u>
Photograph Direction <u>SW</u>

Comments:



Photograph Number <u>42</u>
Photograph Direction West

Comments:



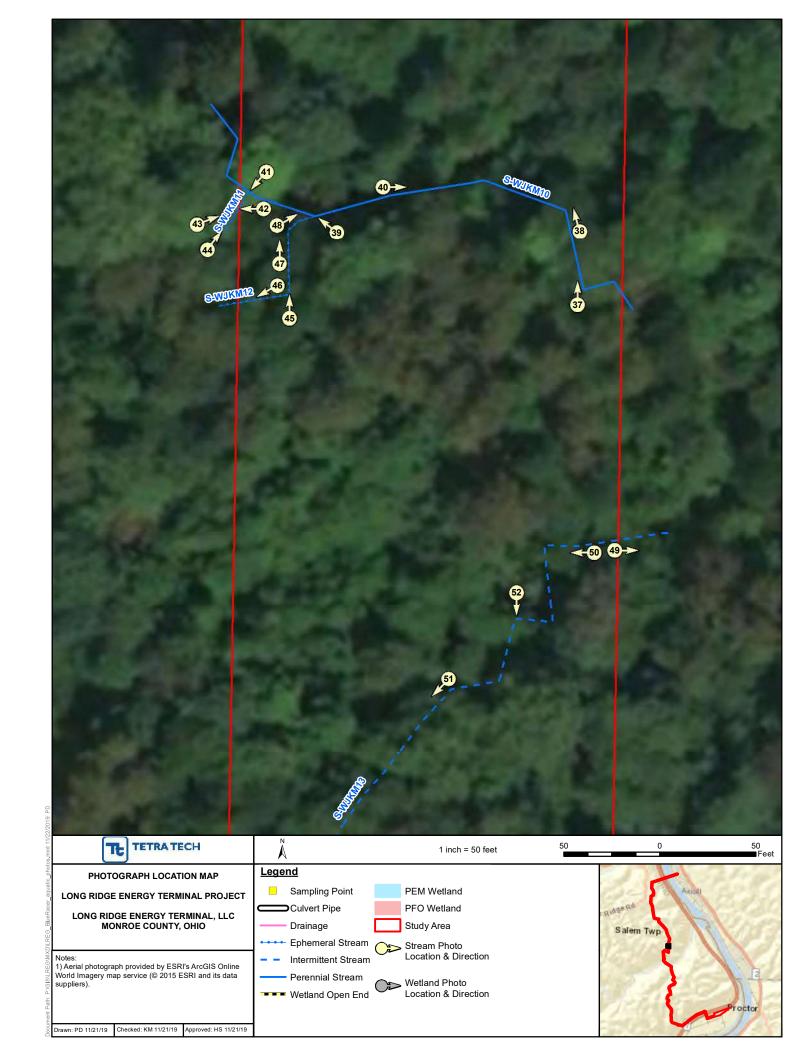
Photograph Number 43
Photograph Direction ENE

Comments:



Photograph Number 44

Photograph Direction NE



S-W.I	KM12	Class
3-440	IX IVI I Z J	IVIA53



Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM12 RIVER BASIN Ohio DRAINAGE AREA (mi²)	52
LENGTH OF STREAM REACH (ft) 127 LAT. 39.73116 LONG80.86380 RIVER CODE RIVER MILE	
DATE 11/07/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	ctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECO *Modified if Checked*	VERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	UUE
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	HHE Metri
BLDR SLABS [16 pts] 0% SILT [3 pt] 10%	Point
BOULDER (>256 mm) [16 pts]	Substra
□ BEDROCK [16 pt] 10% □ FINE DETRITUS [3 pts] 0% □ COBBLE (65-256 mm) [12 pts] 10% □ CLAY or HARDPAN [0 pt] 35%	Max = 4
GRAVEL (2-64 mm) [9 pts] 15% MUCK [0 pts] 0%	16
SAND (<2 mm) [6 pts]	10
Total of Percentages of 30.00% (A) Substrate Percentage Check (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 7	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Max = 3
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS 2.5 cm - raining during assessment MAXIMUM POOL DEPTH (centimeters): 3	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfu
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
<pre></pre>	Max=30
0.61 m	5
COMMENTS U.51 III AVERAGE BANKFULL WIDTH (meters): 0.61	
This information <u>must</u> also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\frac{1}{2}\text{NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ and } \frac{1}{2}\text{River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ and } \frac{1}{2}\text{River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ and } \frac{1}{2}\text{River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{ and } \frac{1}{2}\text{ and } \frac{1}{2} and	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m Immature Forest, Shrub or Old 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 Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0	
0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE Flat (0.5 #/400 #) Flat to Moderate) #\

ADDITIONAL STREAM INFORMATION (This Information Must A	Iso be Completed):
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Gilmore Run	Distance from Evaluated Stream 0.00 ft.
CWH Name:	
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Tow	wnship / City: Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/07/19 Quantity: 0.44
Photograph Information: See Attached Figure 4 and Stream Date	a Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
Were samples collected for water chemistry? (Y/N): N (Note	lab sample no. or id. and attach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y	not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N N	
· /	cher collections optional. NOTE: all voucher samples must be labeled with the site
	data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders	s Observed? (Y/N) N Voucher? (Y/N) N
riogs of Taupoles Observed? (17/N) N Voucher? (17/N) N Aq	uatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-WJKM12</u> Date <u>11/07/19</u>



Photograph Number <u>45</u>
Photograph Direction North

Comments:



Photograph Number <u>46</u>
Photograph Direction <u>WSW</u>

Comments:

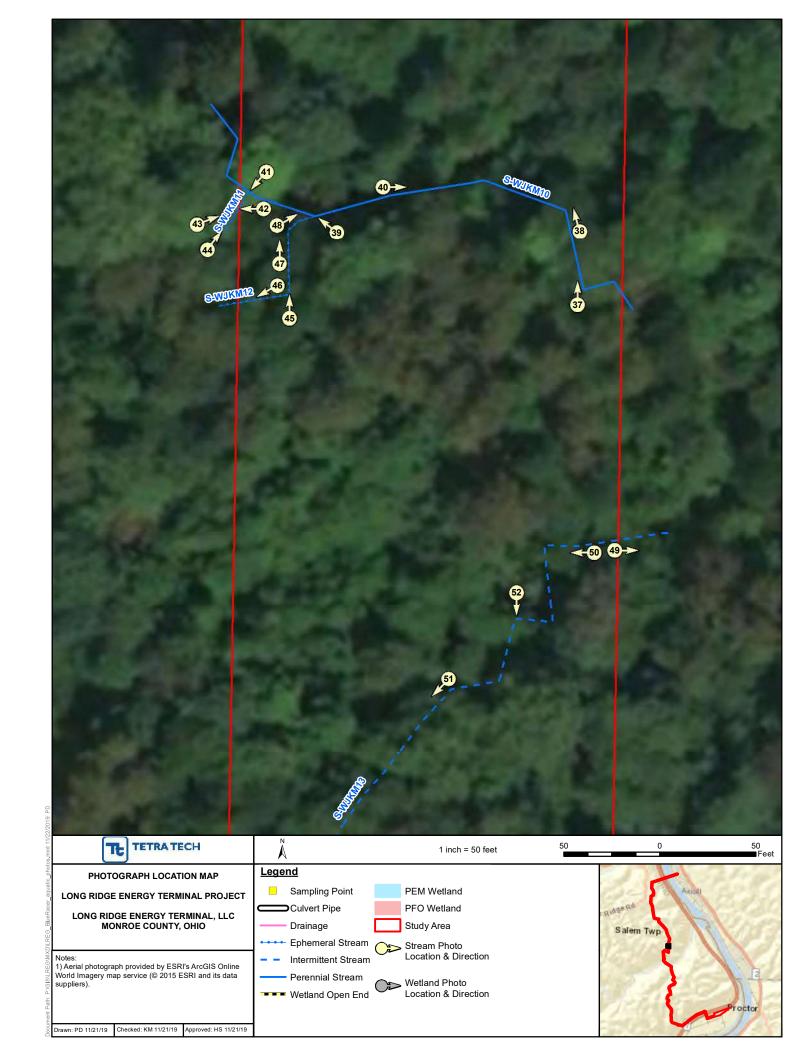


Photograph Number 47
Photograph Direction North

Comments:



Photograph Number 48
Photograph Direction NE



C W IKM12
3-WUKIVI I 3

Class 1



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM13 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.01
LENGTH OF STREAM REACH (ft) 385 LAT. 39.73048 LONG80.86355 RIVER CODE RIVER MILE	
DATE 11/07/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	ı HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] PERCENT TYPE SILT [3 pt] 15%	Metric Points
BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] BEDROCK [16 pt] D'W LEAF PACK/WOODY DEBRIS [3 pts] O'W FINE DETRITUS [3 pts]	Substrate Max = 40
☐ COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 35% ☐ GRAVEL (2-64 mm) [9 pts] MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	14
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock (A) Substrate Percentage Check (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Pool Depth Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS 2.5 cm - raining during assessment MAXIMUM POOL DEPTH (centimeters): 2.5	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
COMMENTS 0.46 m AVERAGE BANKFULL WIDTH (meters): 0.46	5
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY L. B. (Most Prodominant for Bank) L. B. (Most Prodominant for Bank)	
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage	
☐☐ Moderate 5-10m ☐☐ Immature Forest, Shrub or Old ☐☐ Urban or Industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cr	ор
None Fenced Pasture Mining or Construction	ı
•	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS The control of Evaluation (Check ONLY one box): Moist Channel, isolated pools, no flow (Intermittent of the control of the co) [
Stream Flowing Subsurface flow with isolated pools (Interstitial) Moist Channel, isolated pools, no flow (Intermittent Dry channel, no water (Ephemeral))]

ADDITIONAL STREAM INFORMATION (This Information Must Als	so be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Gilmore Run	Distance from Evaluated Stream 57.00 ft.
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: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Tow	nship / City: Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_	11/07/19 Quantity: 0.44
Photograph Information: See Attached Figure 4 and Stream Data	Form Photographs.
Elevated Turbidity? (Y/N): N Canopy (% open): 0	%
Were samples collected for water chemistry? (Y/N): Note I	ab 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) If no	ot, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N N	
· / — · · · · · · · · · · · · · · · · ·	ner collections optional. NOTE: all voucher samples must be labeled with the sit
	ata sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqu	Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-WJKM13</u> Date <u>11/07/19</u>



Photograph Number <u>49</u>
Photograph Direction East

Comments:



Photograph Number 50
Photograph Direction West

Comments:

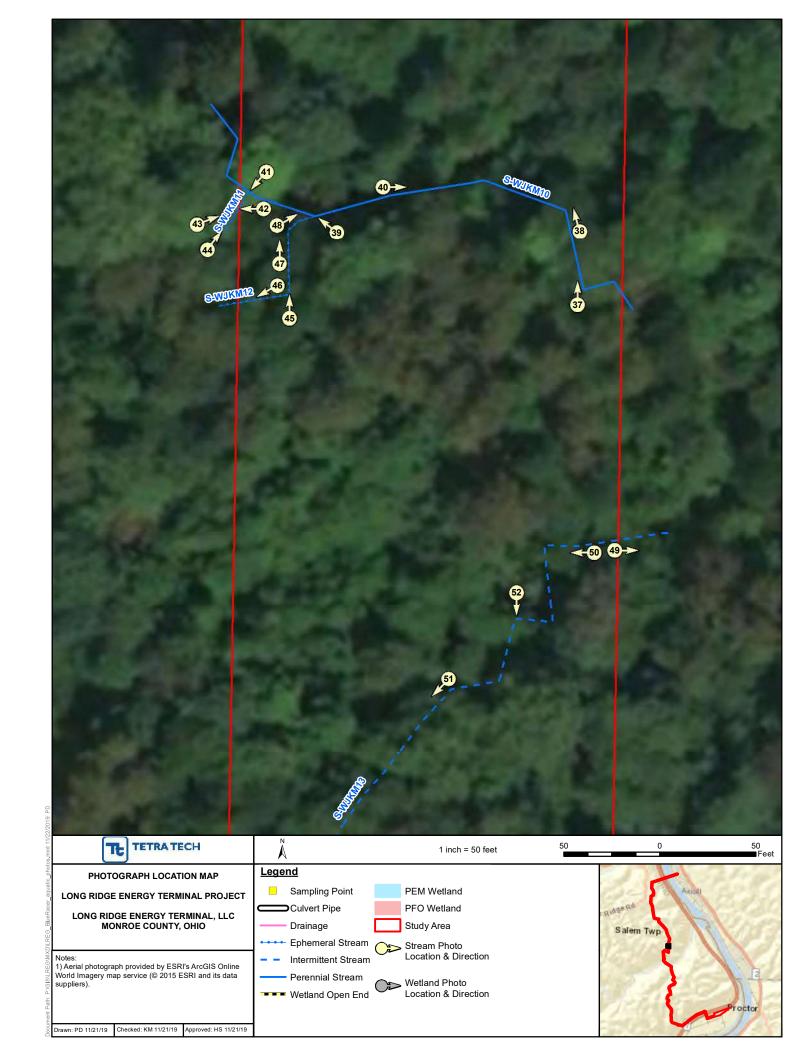


Photograph Number 51
Photograph Direction SW

Comments:



Photograph Number 52
Photograph Direction South



S-\	WJ	KM	14	ı
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Class 1



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM14 RIVER BASIN Ohio DRAINAGE AREA (mi²) 0.	.05
LENGTH OF STREAM REACH (ft) 92 LAT. 39.72774 LONG80.86592 RIVER CODE RIVER MILE	
DATE 11/07/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
□ BLDR SLABS [16 pts] □ □ SILT [3 pt] 15%	Points
BOULDER (>256 mm) [16 pts]	Substrat
COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 45%	Max = 4
☐ GRAVEL (2-64 mm) [9 pts] 20% MUCK [0 pts] 0% ☐ SAND (<2 mm) [6 pts]	14
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 3
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	_
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS 2.5 cm - raining during assessment MAXIMUM POOL DEPTH (centimeters): 2.5	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Max=30
COMMENTS 0.61 m AVERAGE BANKFULL WIDTH (meters): 0.61	5
AVEICAGE BANKI GEE WIS III (IIIctors).	
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m	
Moderate 5-10m Moderate 5-10m	an.
Narrow <5m	·Þ
None Fenced Pasture Mining or Construction COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	
COMMENTS	-
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None	
✓ 0.5	
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe)O #\
	JO 11)

ADDITIONAL STREAM INFORMATION (This Information Must A	Iso be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Oppossum Creek	Distance from Evaluated Stream 749.00 ft.	
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: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Tow	wnship / City: Salem	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/07/19 Quantity: 0.44	
Photograph Information: See Attached Figure 4 and Stream Date	a Form Photographs.	
Elevated Turbidity? (Y/N): N Canopy (% open): 0%		
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	ot, please explain:	
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
Performed? (Y/N): (If Yes, Record all observations. Vou	cher collections optional. NOTE: all voucher samples must be labeled with the site	
	data sheets from the Primary Headwater Habitat Assessment Manual)	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders	s Observed? (Y/N) N Voucher? (Y/N) N	
riogs of Taupoles Observed? (17/N) N Voucher? (17/N) N Aq	uatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>S-WJKM14</u> Date <u>11/07/19</u>



Photograph Number <u>53</u>
Photograph Direction <u>SW</u>

Comments:



Photograph Number <u>54</u>
Photograph Direction <u>SW</u>

Comments:



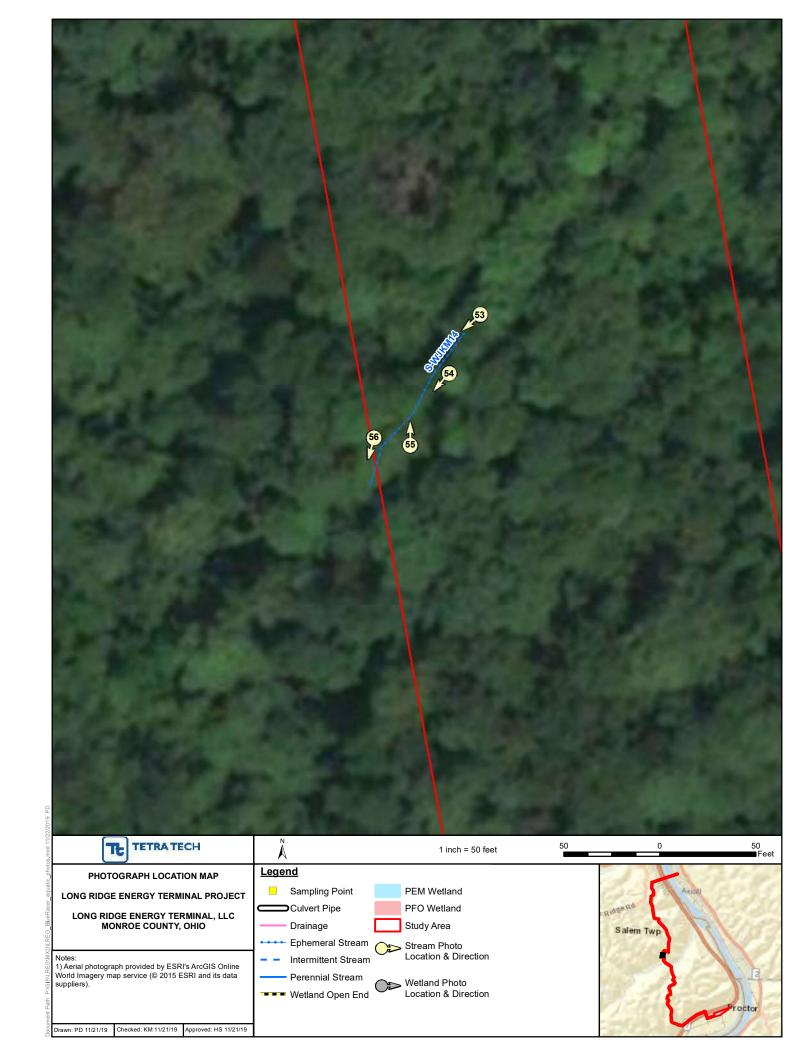
Photograph Number 55
Photograph Direction North

Comments:



Photograph Number 56

Photograph Direction SW



S-WJKM15

Modified Class 2

Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-WJKM15 RIVER BASIN Ohio DRAINAGE AREA	(mi²) 0.06
LENGTH OF STREAM REACH (ft) 256 LAT. 39.72675 LONG80.86547 RIVER CODE RIVER	MILE
DATE 11/08/19 SCORER KMM, WJ COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for	or Instructions
STREAM CHANNEL	NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCEN	r Metric
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] D SILT [3 pt] LEAF PACK/WOODY DEBRIS [3 pts]	Points
BEDROCK [16 pt] BEDROCK [16 pt] FINE DETRITUS [3 pts] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts] 15% CLAY or HARDPAN [0 pt] 0% MUCK [0 pts]	iviax – 40
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] 10% MUCK [0 pts] 0% 0%	32
Total of Percentages of 45.00% (A) Substrate Percentage 100% (B)	A + B
Bidr Slabs, Boulder, Cobble, Bedrock	7
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time	of Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
	15
COMMENTS MAXIMUM POOL DEPTH (centimeters):	10
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (-1.5 m (> 3' 3" - 4' 8") [15 pts] \(\leq 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS AVERAGE BANKFULL WIDTH (meters):	2.13 20
This information must also be completed	am Ar
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstre RIPARIAN WIDTH FLOODPLAIN QUALITY	am x
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m	Tillogo
Wide >10m	_
Field — Open Pasture	
Narrow <5m Residential, Park, New Field Marrow <5m	·
None Fenced Pasture Mining or Cons	struction
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Inte	ermittent)
Subsurface flow with isolated nools (Interstitial) Dry channel no water (Enhanced)	
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 3.0	
COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0 3.0 0.5 STREAM GRADIENT ESTIMATE	Pre (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Als	so be Completed):	
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Oppossum Creek	Distance from Evaluated Stream 292.00 ft.	
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: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Town	nship / City: Salem	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_	11/07/19 Quantity: 0.03	
Photograph Information: See Attached Figure 4 and Stream Data	Form Photographs.	
Elevated Turbidity? (Y/N): N Canopy (% open): 0%		
Were samples collected for water chemistry? (Y/N): N (Note I	ab 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) If no	t, please explain:	
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N		
· / ———	ner collections optional. NOTE: all voucher samples must be labeled with the sit	
	ita sheets from the Primary Headwater Habitat Assessment Manual)	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqu	Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>s-wJKM15</u> Date <u>11/08/19</u>



Photograph Number <u>57</u>
Photograph Direction <u>SE</u>

Comments:



Photograph Number <u>58</u>
Photograph Direction <u>SE</u>

Comments:



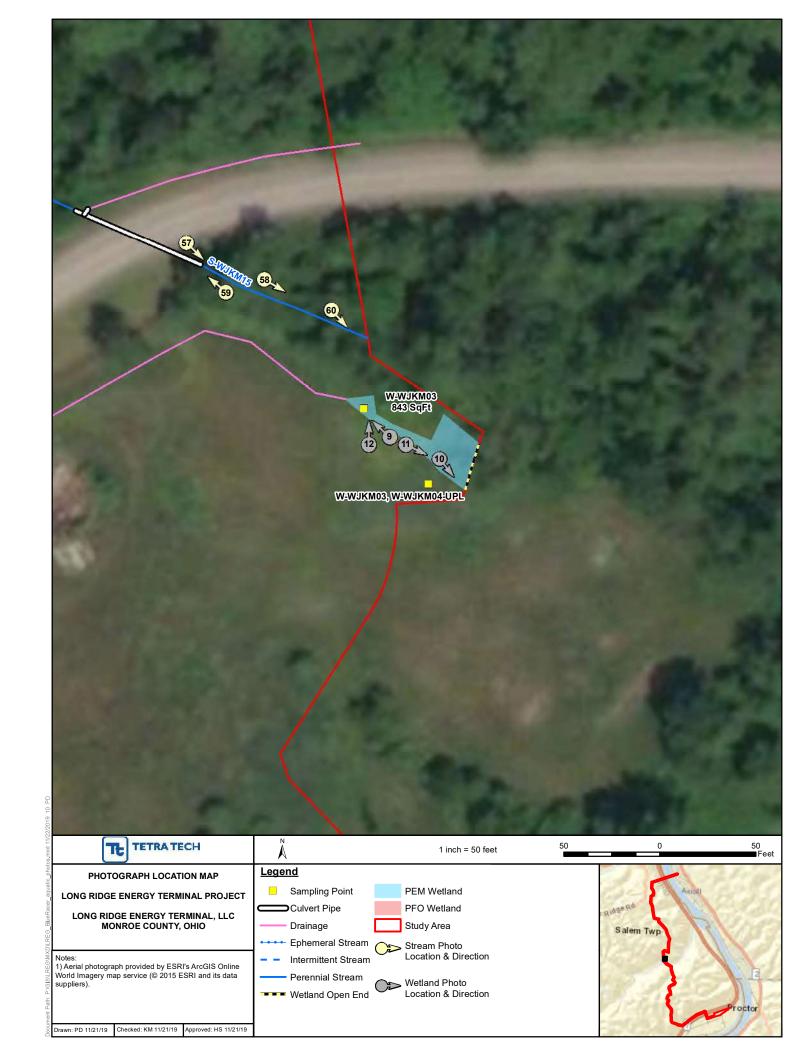
Photograph Number 59
Photograph Direction NW

Comments:



Photograph Number 60

Photograph Direction SE





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:	48.0
QIILI OCOIC.	

Stream & Location: S-WJKM16 (Opossum Creek)	_ <i>RM:</i>	<i>Date:</i> 11	/08/2019
Scorers Full Name & Affiliation.	Korey Mo	Cluskey, Wyat	tt Jackson_
River Code: STORET #: Lat./Long.: 39.725484, -80	0.865065		Office verified location
1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE BLDR /SLABS [10] 0% 0%	ONE (<i>Or 2</i> &	average) QUALIT ☑ HEAVY [-2]	Υ
□ BOULDER [9] 0% 0% □ DETRITUS [3] 0% 0% □ TILLS [1] □ COBBLE [8] 15% 35% □ MUCK [2] 0% 0% □ WETLANDS [0] □ GRAVEL [7] 35% 40% □ SILT [2] 25% 10% □ HARDPAN [0] □ SAND [6] 25% 15% □ ARTIFICIAL [0] 0% 0% ✓ SANDSTONE [0] □ BEDROCK [5] 0% 0% (Score natural substrates; ignore point-sources) □ RIP/RAP [0] NUMBER OF BEST TYPES: 4 or more [2] sludge from point-sources) □ LACUSTURINE [0] Comments □ SHALE [-1]	SILT BODEON	☐ MODERATI ☐ NORMAL [I ☐ FREE [1] ☐ EXTENSIVI ☐ MODERATI ☐ NORMAL [I ☐ NONE [1]	
COAL FINES [-2]			
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more commit quality; 2-Moderate amounts, but not of highest quality or in small amounts quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional UNDERCUT BANKS [1]	s of highest er, large al pools. [ERS [1] [/TES [1] [Check ONE (Or : EXTENSIVE > MODERATE 2 SPARSE 5-<2! NEARLY ABSI	2 & average) 75% [11] 5-75% [7] 5% [3]
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)			
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY			
☐ HIGH [4] ☐ EXCELLENT [7] ☑ NONE [6] ☑ HIGH [3] ☐ MODERATE [3] ☑ GOOD [5] ☐ RECOVERED [4] ☐ MODERATE [2] ☑ LOW [2] ☐ FAIR [3] ☐ RECOVERING [3] ☐ LOW [1] ☐ NONE [1] ☐ POOR [1] ☐ RECENT OR NO RECOVERY [1] Comments	1		Channel 16.0
41 BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (0	Or 2 per bank	(& average)	
River right looking downstream RIPARIAN WIDTH FLOOD PLAIN QUAL	ITY L R	3 ,	
EROSION	☑ ☑ (1 ☑ ☑ [1] ☑ Indicate	CONSERVATION URBAN OR INDU MINING / CONSTI e predominant land 00m riparian. R	STRIAL [0] RUCTION [0]
Comments			aximum 6.0
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY	· · · · · · · · · · · · · · · · · · ·	Recreation I	Potential
Check ONE (ONLY!) Check ONE (Or 2 & average) Check ALL that apply □ > 1m [6] □ POOL WIDTH > RIFFLE WIDTH [2] □ TORRENTIAL [-1] □ SLOW [1] □ 0.7-<1m [4]	ITIAL [-1] FTENT [-2]	Secondary (circle one and com	Contact
☐ < 0.2m [0] Indicate for reach - pools and r Comments	iffles.		Current eximum 12
☐ BEST AREAS > 10cm [2]	FLE / RU	tion □NO RII N EMBEDDEI ONE [2]	FFLE [metric=0]
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ BEST AREAS < 5cm ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0] Comments		OW [1] IODERATE [0] XTENSIVE [-1] _{M.}	Riffle / Run aximum 4.0
			8
6] GRADIENT (ft/mi))%GLIDE)%RIFFLE	\longrightarrow	eximum 2.0

AJ SAMPLED REACH Check ALL that apply		//Is reach typical of steam?, Recreation	n/Observed - Inferred, <i>Other</i> /	Comment RE: Reach consistency/1s reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.	ess directions, etc.
٥	H				
☐ L. LINE ☐ UP	יר יר				
DISTANCE DRY					
CLARITY	TY BJ AESTHETICS	DJ MAINTENANCE	Circle some & COMMENT	EJISSUES	FJ MEASUREMENTS
_	ass 2nd NUISANCE ALGAE	PUBLIC / PRIVATE / BOTH / NA		WWTP / CSO / NPDES / INDUSTRY	x width 75 ft.
اك	☐ INVASIVE MACROPHYTES	S ACTIVE / HISTORIC / BOTH / NA		HARDENED/URBAN/DIRT&GRIME	
	L CEXCESS TURBIDITY	YOUNG-SUCCESSION-OLD		CONTAMINATED / LANDFILL	pth
40-70 cm		SPRAY / SNAG / REMOVED		BMPs-CONSTRUCTION-SEDIMENT	/idth
meters SECCHI DEPTH	EPTH OLSHEEN	MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED		LOGGING / IRRIGATION / COOLING BANK / EROSION / SURFACE	bankfull x depth 8 ft.
CANOPY 1st	Cm TRASH / LITTER	RELOCATED / CUTOFFS		FALSE BANK / MANURE / LAGOON	W/D ratio
	□ NUISANCE ODOR	MOVING-BEDLOAD-STABLE		WASH H ₂ 0 / TILE / H ₂ 0 TABLE	bankfull max, depth
7.53%- CI	Cm SLUDGE DEPOSITS	ARMOURED / SLUMPS		ACID / MINE / QUARRY / FLOW	floodprone x ² width
30%-<55%	CSOS/SSOS/OUTFALLS	ISLANDS / SCOURED		NATURAL / WETLAND / STAGNANT	entrench. ratio
	CI RECREATION AREA DEPTH	IMPOUNDED / DESICCATED		PARK / GOLF / LAWN / HOME	Legacy Tree:
SED	POOL: □ >100ft² □ >3ft	FLOOD CONTROL / DRAINAGE		ATMOSPHERE / DATA PAUCITY	

Stream Drawing:

Stream ID <u>S-WJKM16</u> Date <u>11/08/2019</u>



Photograph Number 61
Photograph Direction SW

Comments:



Photograph Number 62
Photograph Direction NE

Comments:

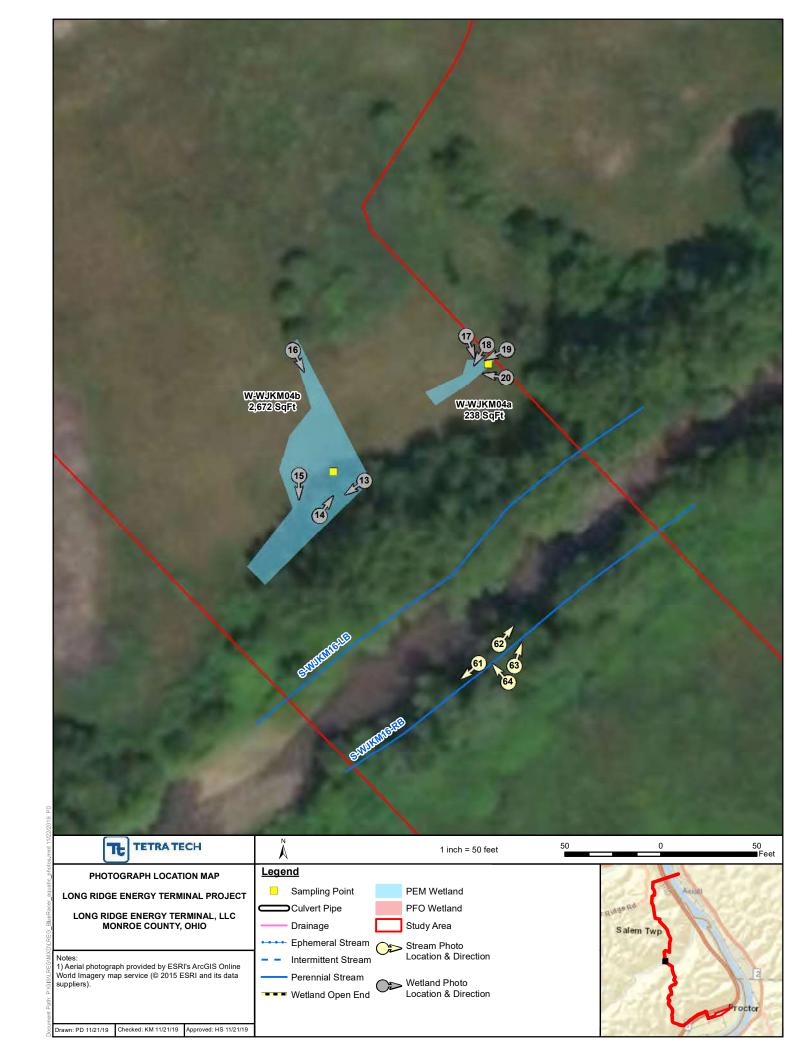


Photograph Number 63
Photograph Direction NNE

Comments:



Photograph Number 64
Photograph Direction NNW



S-KP01	Modified Class 2
3-NPU1	INIOUIIIEU CIASS 2



Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Pr	oject
	VER BASIN Ohio DRAINAGE AREA (mi²) 0.50
	LONG80.86041 RIVER CODE RIVER MILE
DATE 11/11/19 SCORER JMM, KMP COMMEN	тѕ
NOTE: Complete All Items On This Form - Refer to "Fiel	d Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL MODIFICATIONS:	RECOVERED RECOVERING RECENT OR NO RECOVERY *Modified if Checked*
SUBSTRATE (Estimate percent of every type of substrate)	te present. Check ONLY two predominant substrate TYPE boxes
(Max of 32). Add total number of significant substrate types	found (Max of 8). Final metric score is sum of boxes A & B.
TYPE PERCENT TY BLDR SLABS [16 pts] 0%	PE SILT [3 pt] PERCENT OW POINTS
BOULDER (>256 mm) [16 pts] 45%	LEAF PACK/WOODY DEBRIS [3 pts]
BEDROCK [16 pt] 0%	FINE DETRITUS [3 pts] O% Substrate Max = 40
COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] 15%	CLAY or HARDPAN [0 pt] MUCK [0 pts] 0% 0%
SAND (<2 mm) [6 pts] 15%	ARTIFICIAL [3 pts]
Total of Percentages of 70.00% (A)	Substrate Percentage 100% (B) A + B
Bldr Slabs, Boulder, Cobble, Bedrock	28 TOTAL NUMBER OF SUBSTRATE TYPES: 4
	th within the 61 meter (200 ft) evaluation reach at the time of Pool Depth
evaluation. Avoid plunge pools from road culverts or storm v > 30 centimeters [20 pts]	water pipes) (Check <i>ONLY</i> one box): > 5 cm - 10 cm [15 pts]
> 22.5 - 30 cm [30 pts]	< 5 cm [5 pts]
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHANNEL [0 pts]
COMMENTS	MAXIMUM POOL DEPTH (centimeters): 3
3. BANK FULL WIDTH (Measured as the average of 3-4 me	
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] Width ≤ 1.0 m (<=3' 3") [5 pts] Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS	AVERAGE BANKFULL WIDTH (meters): 1.50 1
This info RIPARIAN ZONE AND FLOODPLAIN QUALITY	rmation <u>must</u> also be completed ☆NOTE: River Left (L) and Right (R) as looking downstream☆
RIPARIAN WIDTH FLOODPLAIN C	
	Predominant per Bank) E Forest, Wetland L R Conservation Tillage
	ture Forest, Shrub or Old Urban or Industrial
Field	Open Pasture Row Crop
	ential, Park, New Field
None Fence COMMENTS	ed Pasture Mining or Construction
FLOW REGIME (At Time of Evaluation) (Check Of	V/ Y one box)·
Stream Flowing `	Moist Channel, isolated pools, no flow (Intermittent)
Subsurface flow with isolated pools (Interstitial) COMMENTS_stream flow goes subsurface in	Dry channel, no water (Ephemeral) n disturbed ROW area; re-emerges downstream
	channel) (Check ONLY one box):
COMMENTS_stream flow goes subsurface in	n disturbed ROW area; re-emerges downstream
SINUOSITY (Number of bends per 61 m (200 ft) of control of the con	channel) (Check ONLY one box):
SINUOSITY (Number of bends per 61 m (200 ft) of c	channel) (Check ONLY one box): 2.0 2.5 3.0 >3

QHEI PERFORMED? - Yes V No QHEI Score (If Yes, Attach Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Opossum Creek Distance from Evaluated Stream 0.50	mi.	
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	N	
USGS Quadrangle Name: New Martinsville NRCS Soil Map Page: NRCS Soil Map Stream Order		
County: Monroe Township / City: Salem		
MISCELLANEOUS		
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/08/19 Quantity: 0.70		
Photograph Information: See Attached Stream Photograph Page		
Elevated Turbidity? (Y/N): N Canopy (% open): 0%		
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) If not, please explain:		
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N N		
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled v	ith the site	
ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouc		
· 10 · 10 · 10 · 10 · 10 · 10 · 10 · 10		
Comments Regarding Biology:		



Stream ID <u>S-KP01</u> Date <u>11/11/19</u>



Photograph Number 69
Photograph Direction SSE

Comments:



Photograph Number 70
Photograph Direction NNW

Comments:



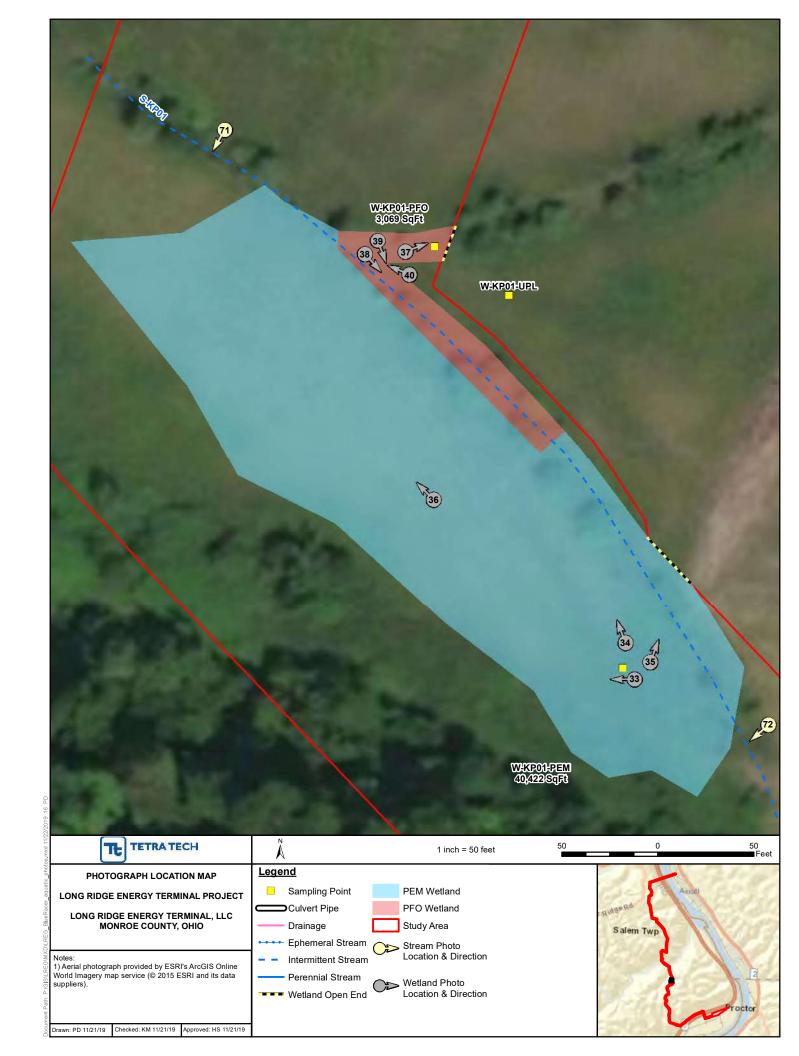
Photograph Number 71

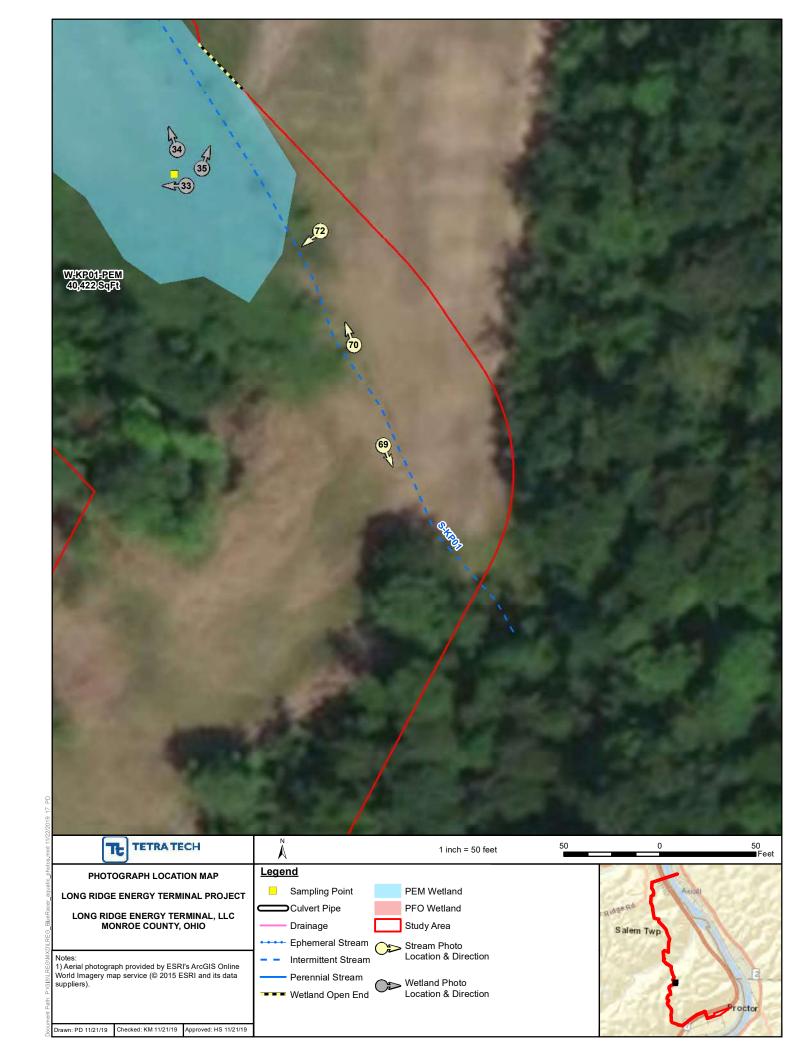
Photograph Direction SSW

Comments:



Photograph Number 72
Photograph Direction SW





S-KP02	Class 1



Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-KP02 RIVER BASIN Ohio DRAINAGE AREA (mi²)	.10
LENGTH OF STREAM REACH (ft) 114 LAT. 39.72270 LONG80.86210 RIVER CODE RIVER MILE	
DATE 11/11/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. PERCENT TYPE SILT [3 pt] LEAF PACK/WOODY DEBRIS [3 pts] O% CLAY or HARDPAN [0 pt] O% ARTIFICIAL [3 pts] O% Check Substrate Percentage Check TOTAL NUMBER OF SUBSTRATE TYPES: 4	HHEI Metric Points Substrate Max = 40
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 4	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts] COMMENTS Max depth = 2.54cm MAXIMUM POOL DEPTH (centimeters): 2.54	Pool Dept Max = 30
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] > 1.0 m (<=3' 3") [5 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Bankfull Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.15	5
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ♣NOTE: River Left (L) and Right (R) as looking downstream ♣ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Mature Forest, Shrub or Old Urban or Industrial Narrow <5m Residential, Park, New Field Open Pasture, Row Cro None Fenced Pasture Mining or Construction COMMENTS within old pipeline right-of-way	op
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS The control of Evaluation (Check ONLY one box): Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0 3.0 3.0 3.5 STREAM GRADIENT ESTIMATE	

ADDITIONAL STREAM INFORMATION (This Information Must Als	o be Completed):			
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attack	n Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)		,		
WWH Name: Opossum Creek		Distance from Evaluated Stream	0.30	mi.
CWH Name:		Distance from Evaluated Stream		
EWH Name:		Distance from Evaluated Stream		
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE E	NTIRE WATERSHED A	AREA. CLEARLY MARK THE SITE	LOCATION	
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Paç	ge: NRCS Soil Map Strea	m Order _	
County: Monroe Town	ship / City: Salem			
MISCELLANEOUS				
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/08/19	Quantity: 0.70		
Photograph Information: See Attached Stream Photograph Page				
Elevated Turbidity? (Y/N): N Canopy (% open): 0	%			
Were samples collected for water chemistry? (Y/N): Note la	ab sample no. or id. an	d attach results) Lab Number:		
	pH (S.U.)	Conductivity (µmhos/cm)		
Is the sampling reach representative of the stream (Y/N) If no	t nlease evnlain:			
The state statisting reason representative of the stream (1774)	, рючое охрант			
Additional comments/description of pollution impacts:				
BIOTIC EVALUATION				
Performed? (Y/N): (If Yes, Record all observations. Vouch	er collections optional.	NOTE: all voucher samples must be	labeled with	the site
ID number. Include appropriate field da	ta sheets from the Prim	ary Headwater Habitat Assessment N	Manual)	
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders	Observed? (Y/N)	Voucher? (Y/N)	N	1
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aqu	atic Macroinvertebrates	S Observed? (Y/N) N Voucher?	Y(Y/N)]
Comments Regarding Biology:				



Stream ID <u>S-KP02</u> Date <u>11/11/19</u>



Photograph Number 73

Photograph Direction South

Comments:



Photograph Number 74
Photograph Direction NNW

Comments:



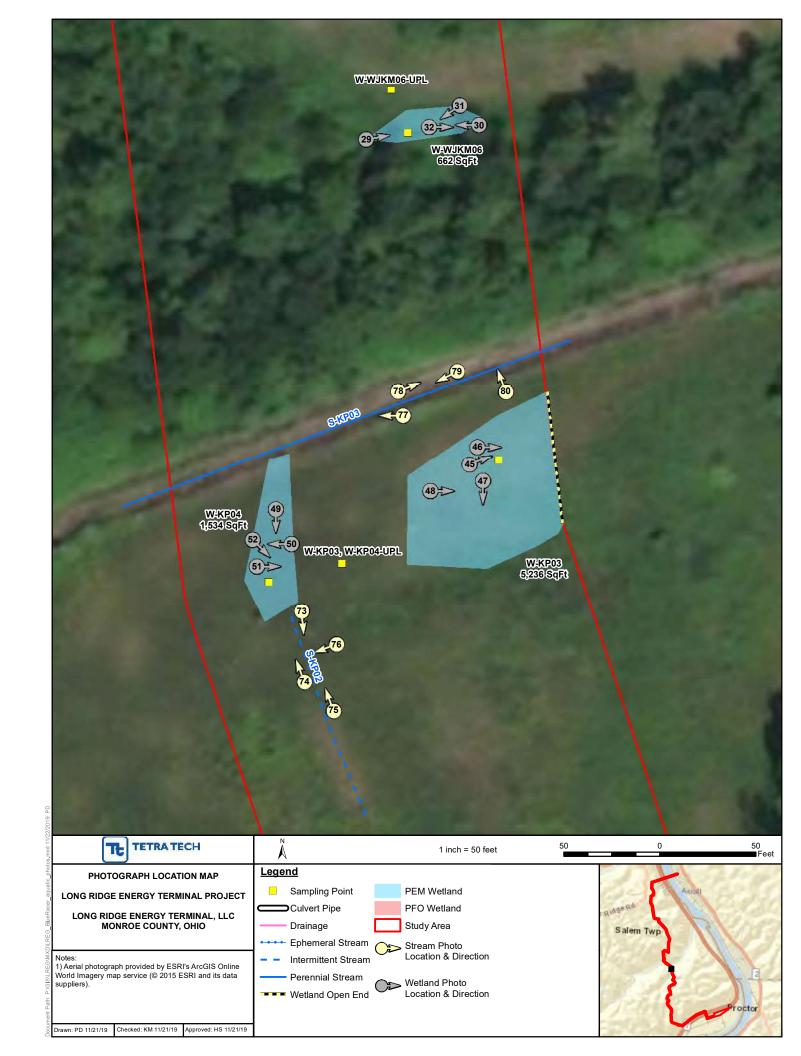
Photograph Number 75

Photograph Direction NNW

Comments:



Photograph Number 76
Photograph Direction WSW



S-KP03	Modified Class 2



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-KP03 RIVER BASIN Ohio DRAINAGE AREA (mi²	0.70
LENGTH OF STREAM REACH (ft) 249 LAT. 39.72312 LONG80.86205 RIVER CODE RIVER MILI	
DATE 11/11/19 SCORER JMM, KMP COMMENTS artificial substrate made out of mesh fabric m	aterial
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for In	structions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO F *Modified if Checked*	RECOVERY
SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxe (May of 20) Add total number of significant substrate types found (May of 2). Find matrix source is supported by the property of the property	s HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 0%	Max = 40
☐ GRAVEL (2-64 mm) [9 pts] ☐ MUCK [0 pts] ☐ 0% ☐ MUCK [0 pts] ☐ 0% ☐ O%	7
Total of Percentages of 0.00% (A) Substrate Percentage 0% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Max = 30
> 30 centimeters [20 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	_ 15
COMMENTS MAXIMUM POOL DEPTH (centimeters): 8	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.0 m (-3' 3") [5 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): This information must also be completed	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ARIPARIAN WIDTH FLOODPLAIN QUALITY FLOODPLAIN QUALITY	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH EL R (Per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY Most Predominant per Bank) Mide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field Open Pasture, Row Narrow <5m Residential, Park, New Field Mining or Construct COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermitt)	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY Wide > 10 m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Penced Pasture COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream And RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Open Pasture, Row None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS None And Flood Pasture Mining or Construct COMMENTS Moist Channel, isolated pools, no flow (Intermitt Dry channel, no water (Ephemeral)	Width Max=30 20 Crop
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field PLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) None 1.0 None 1.0 None 1.0 COMMENTS RIPARIAN WIDTH FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters): 1.50 AVERAGE BA	Width Max=30 20 Crop ion ent)

ADDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Opossum Creek	Distance from Evaluated Stream
CWH Name: _	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe Tox	wnship / City:Salem
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_Y Date of last precipitation:_	11/08/19 Quantity: 0.70
Photograph Information: See Attached Stream Photograph Page	e
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
Were samples collected for water chemistry? (Y/N): N (Note	e 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	not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N	
· / _	cher collections optional. NOTE: all voucher samples must be labeled with the sit
	data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-KP03</u> Date <u>11/11/19</u>



Photograph Number <u>77</u>
Photograph Direction West

Comments:



Photograph Number 78

Photograph Direction ENE

Comments:

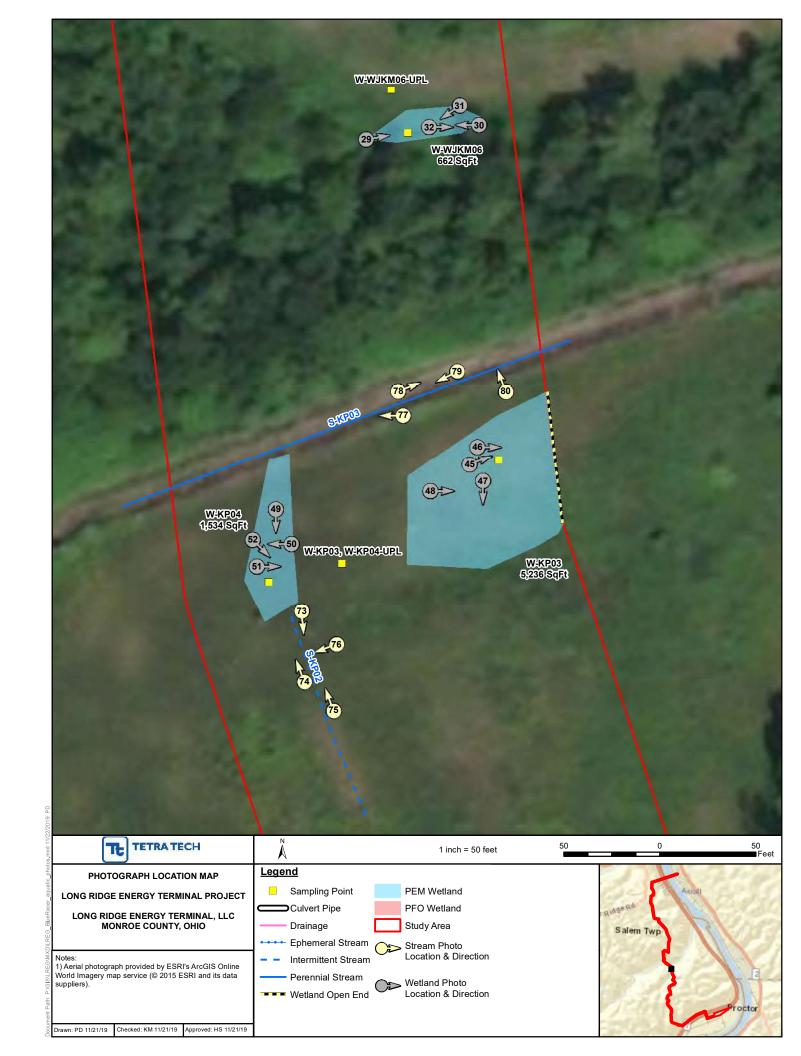


Photograph Number 79
Photograph Direction WSW

Comments:



Photograph Number 80
Photograph Direction NNW



S-KP04	Modified Class 1
5-KP04	INIOGITIEG Class 1

Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-KP04 RIVER BASIN Ohio DRAINAGE AREA (mi²)	22
LENGTH OF STREAM REACH (ft) 238 LAT. 39.70395 LONG80.85601 RIVER CODE RIVER MILE	
DATE 11/11/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruc	ctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECO *Modified if Checked*	VERY
SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHE Metr
TYPE PERCENT TYPE PERCENT BLDR SLABS [16 pts] 0% SILT [3 pt] 15%	Poin
BOULDER (>256 mm) [16 pts] LEAF PACK/WOODY DEBRIS [3 pts]	Substra
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% 0% CI AY OF HARDPAN [0 pt] 25%	Max =
COBBLE (65-256 mm) [12 pts] 10% CLAY or HARDPAN [0 pt] 25% WUCK [0 pts] 0%	
SAND (<2 mm) [6 pts] 20% ARTIFICIAL [3 pts] 0%	14
Total of Percentages of 10.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5	Α.Β
 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): 	Pool De Max = 3
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts]	5
May doubh = 2 54cm)
COMMENTS MAXIMUM POOL DEPTH (centimeters): 2.54	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfu
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=3
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.15	5
	_
This information <u>must</u> also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY LR (Per Bank) LR (Most Predominant per Bank) LR	
Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row Crop)
Narrow Sin Residential, Park, New Field Mining or Construction	
COMMENTS within old pipeline right-of-way	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS The control of Evaluation (Check ONLY one box): Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): ✓ None 1.0 2.0 3.0 0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)) ft)

QHEI PERFORMED? - Yes V No QHEI Score (If Yes	s, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Muhleman Run	Distance from Evaluated Stream _	0.78 m
CWH Name:	Distance from Evaluated Stream _	
EWH Name:	Distance from Evaluated Stream _	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATER	SHED AREA. CLEARLY MARK THE SITE I	OCATION
SGS Quadrangle Name: New Martinsville NRCS Soil I	Map Page: NRCS Soil Map Strear	n Order _
ounty: Monroe Township / City:	Dhio	
MISCELLANEOUS		
ase Flow Conditions? (Y/N): Y Date of last precipitation: 11/08/19	Quantity: 0.70	
notograph Information: See Attached Stream Photograph Page		
evated Turbidity? (Y/N): Canopy (% open):0%		
ere samples collected for water chemistry? (Y/N): Note lab sample no. o	or id. and attach results) Lab Number:	
	U.) Conductivity (µmhos/cm)	
	,	
the sampling reach representative of the stream (Y/N) If not, please explain	in:	
		-
dditional comments/description of pollution impacts:		
BIOTIC EVALUATION		
erformed? (Y/N): N (If Yes, Record all observations. Voucher collections o	ptional. NOTE: all voucher samples must be l	abeled with th
ID number. Include appropriate field data sheets from t	the Primary Headwater Habitat Assessment M	anual)
sh Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinver	N) N Voucher? (Y/N) N Voucher?	(Y/N) N
omments Regarding Biology:	N Voucille :	(· / · /)
J		



Stream ID <u>S-KP04</u> Date <u>11/11/19</u>



Photograph Number 81
Photograph Direction SSE

Comments:



Photograph Number 82
Photograph Direction NNW

Comments:



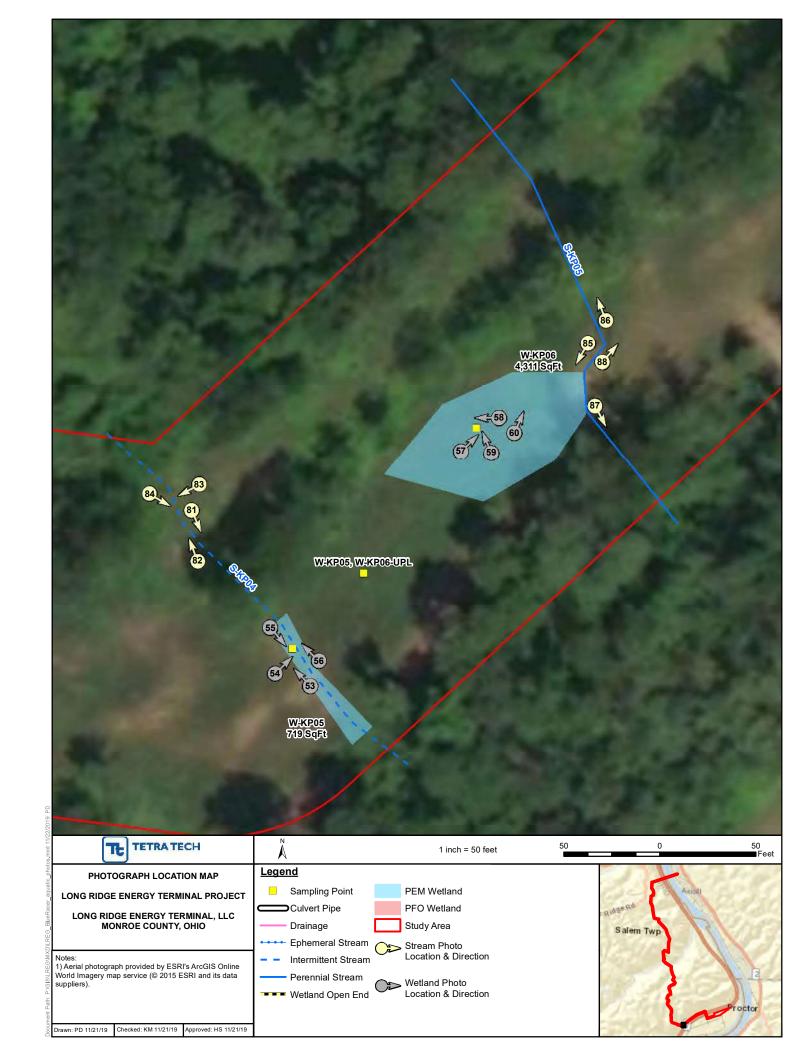
Photograph Number 83
Photograph Direction WSW

Comments:



Photograph Number 84

Photograph Direction ESE



S-KP05	Modified	Cla
3-KF 03	INIOUIIIEU	Ola



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Ene	rgy Terminal Project	
SITE NUMBER S	RIVER BASIN Ohio DRAINAGE AREA (I	mi²) 1.00
LENGTH OF STREAM REACH (ft) 275	LAT. 39.70436 LONG80.85539 RIVER CODE RIVER N	IILE
DATE 11/11/19 SCORER JMM, KN		
NOTE: Complete All Items On This For	m - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for	Instructions
STREAM CHANNEL NONE / NA MODIFICATIONS:	ATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO *Modified if Checked*	O RECOVERY
	very type of substrate present. Check ONLY two predominant substrate TYPE be	oxes I HHEI
	cant substrate types found (Max of 8). Final metric score is sum of boxes A & B. PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]	0% SILT [3 pt] 0% 20% LEAF PACK/WOODY DEBRIS [3 pts] 0%	Points
BEDROCK [16 pt]	0% FINE DETRITUS [3 pts] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts]	40% CLAY or HARDPAN [0 pt] 0% 30% MUCK [0 pts] 0%	
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]	10% MUCK [0 pts] 0% ARTIFICIAL [3 pts] 0%	25
Total of Percentages of	60.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock _ SCORE OF TWO MOST PREDOMINATE SUB		
2. Maximum Pool Depth (Measure the r.	maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from roa > 30 centimeters [20 pts]		Max = 30
> 22.5 - 30 cm [30 pts]	< 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHANNEL [0 pts]	25
COMMENTS	MANUALIM DOOL DEDTIL (
COMMENTS	MAXIMUM POOL DEPTH (centimeters):	22
3. BANK FULL WIDTH (Measured as the	e average of 3-4 measurements) (Check ONLY one box):	Bankfull
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]		
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts]	e average of 3-4 measurements) (Check <i>ONLY</i> one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	e average of 3-4 measurements) (Check <i>ONLY</i> one box):	Bankfull Width
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Check ONLY one box):	Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD	This information must also be completed PLAIN QUALITY (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] AVERAGE BANKFULL WIDTH (meters): 1 This information must also be completed PLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstrear	Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH	This information must also be completed PLAIN QUALITY (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] AVERAGE BANKFULL WIDTH (meters): 1 This information must also be completed PLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream FLOODPLAIN QUALITY	Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Metage of 3-4 measurements) (Check ONLY one box): > 1.0 m (> 3' 3" - 4' 8") [15 pts] AVERAGE BANKFULL WIDTH (meters): 1 AVERAGE BANKFULL WIDTH (meters): 1 L R (Most Predominant per Bank) L R Mature Forest, Wetland Conservation Till	Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank)	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Pick ONLY one box): AVERAGE BANKFULL WIDTH (meters): AVERAGE BANKFULL WIDTH (meters): 1 L R (Most Predominant per Bank) L R (Most Predominant per Bank) Immature Forest, Wetland Urban or Industri	Bankfull Width Max=30 20
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide >10m	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] AVERAGE BANKFULL WIDTH (meters): 1 AVERAGE BANKFULL WIDTH (meters): 1 L R (Most Predominant per Bank) L R (Conservation Till	Bankfull Width Max=30 20
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m V None	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture (Check ONLY one box): 15 pts AVERAGE BANKFULL WIDTH (meters): 1	Bankfull Width Max=30 20 age al ow Crop
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS within old pipe	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Plan (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] AVERAGE BANKFULL WIDTH (meters): 1 AV	Bankfull Width Max=30 20 age al ow Crop
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide > 10m Moderate 5-10m Narrow < 5m None COMMENTS within old pipe FLOW REGIME (At Time of Events	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Plain Quality Residential, Park, New Field Fenced Pasture Moist Channel, isolated pools, no flow (Intermediate) Moist Channel, isolated pools, no flow (Intermediate)	Bankfull Width Max=30 20 age fall ow Crop suction
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS within old pipe FLOW REGIME (At Time of Events of Events And Place of Events An	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Pelaine right-of-way (Check ONLY one box): (Check ONL	Bankfull Width Max=30 20 age fall ow Crop suction
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS within old pipe FLOW REGIME (At Time of Events of	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Plain Quality Residential, Park, New Field Fenced Pasture Moist Channel, isolated pools, no flow (Intermediate) Moist Channel, isolated pools, no flow (Intermediate)	Bankfull Width Max=30 20 age fall ow Crop suction
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Moderate 5-10m Narrow <5m None COMMENTS within old pipe FLOW REGIME (At Time of Ev. Stream Flowing Subsurface flow with isolated po COMMENTS SINUOSITY (Number of bends None	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Conservation Till Immature Forest, Shrub or Old Urban or Industri Field Penced Pasture Mining or Construction Mining or Construction Mining or Construction Most Channel, isolated pools, no flow (Interration) Check ONLY one box): per 61 m (200 ft) of channel (Check ONLY one box): 1.0 2.0 3.0	Bankfull Width Max=30 20 age fall ow Crop suction
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Moderate 5-10m Narrow < 5m None COMMENTS within old pipe FLOW REGIME (At Time of Ev. Stream Flowing Subsurface flow with isolated po COMMENTS SINUOSITY (Number of bends None 0.5	This information must also be completed PLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstrean FLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Mature Forest, Wetland Mature Forest, Shrub or Old Field Residential, Park, New Field Residential, Park, New Field Residential, Park, New Field Mining or Construction Mining or Construction Moist Channel, isolated pools, no flow (Interript Cols (Interstitial) Per 61 m (200 ft) of channel) (Check ONLY one box):	Bankfull Width Max=30 20 age fall ow Crop suction
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Moderate 5-10m Narrow <5m None COMMENTS within old pipe FLOW REGIME (At Time of Ev. Stream Flowing Subsurface flow with isolated po COMMENTS SINUOSITY (Number of bends None	This information must also be completed PLAIN QUALITY L R (Most Predominant per Bank) Immature Forest, Wetland Residential, Park, New Field Residentia	Bankfull Width Max=30 20 age fall ow Crop suction

ADDITIONAL STREAM INFORMATION (This Information Must Also	be Completed):			
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach C	Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)				
WWH Name: Muhleman Run	D	istance from Evaluated Stream	0.43 m	ni.
CWH Name:	_ Di	stance from Evaluated Stream		_
EWH Name:	Di	stance from Evaluated Stream _		_
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION				
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page:	NRCS Soil Map Stream	m Order	
County: Monroe Towns	nip / City: Ohio			
MISCELLANEOUS				
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/08/19	Quantity: 0.70		
Photograph Information: See Attached Stream Photograph Page				
Elevated Turbidity? (Y/N): N Canopy (% open): 10%				
Were samples collected for water chemistry? (Y/N): Note lab	sample no. or id. and a	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) If not, please explain:				
,	'			
Additional comments/description of pollution impacts:				
PIOTIC EVALUATION				
BIOTIC EVALUATION				
Performed? (Y/N): (If Yes, Record all observations. Voucher	·	•		ne site
ID number. Include appropriate field data		Headwater Habitat Assessment M	lanual)	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Of		Voucher? (Y/N)	N	
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquat	c Macroinvertebrates C	Observed? (Y/N) N Voucher?	(Y/N)	
Comments Regarding Biology:				_



Stream ID <u>S-KP05</u> Date <u>11/11/19</u>



Photograph Number <u>85</u>
Photograph Direction <u>SSW</u>

Comments:



Photograph Number <u>86</u>
Photograph Direction <u>NNW</u>

Comments:



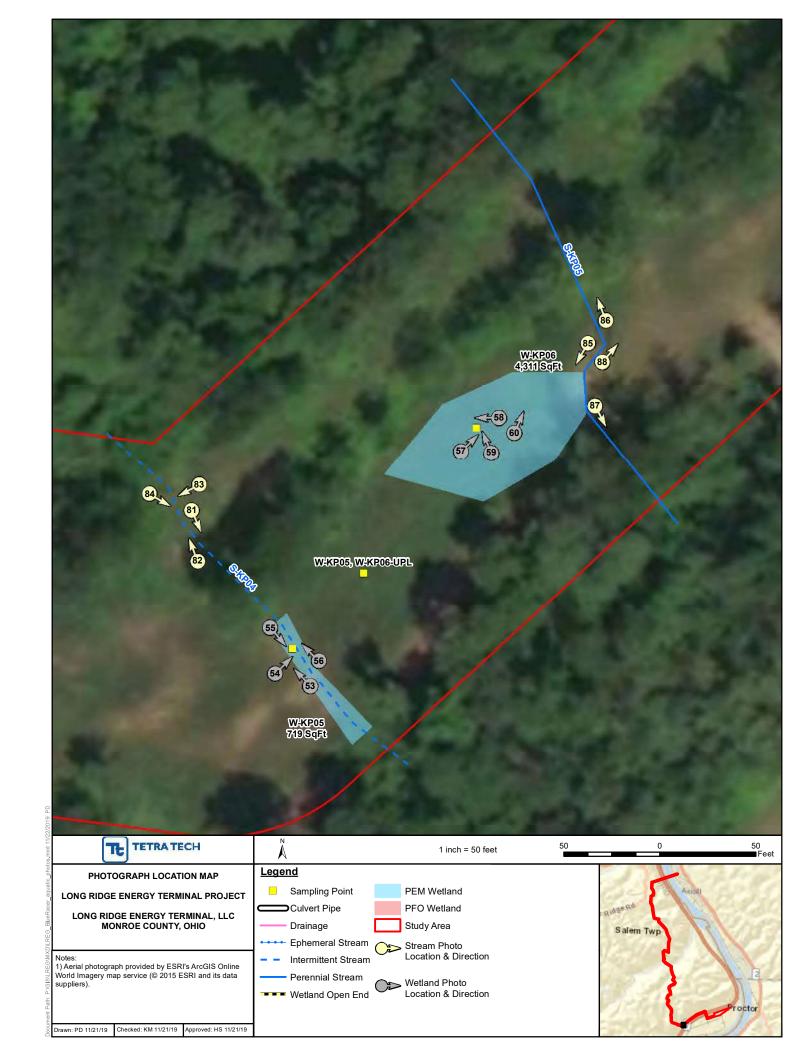
Photograph Number 87
Photograph Direction SSE

Comments:



Photograph Number 88

Photograph Direction NE





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 51.0

Stream & Location:	S-KP05 (Stetson Run)	_RM:	<i>Date:</i> 1	1/11/2019
	Scorers Full Name & Affiliation:	J. McGuir	k, K. Pulver	
River Code:	STORET #: Lat./Long.: 39.704360			Office verified location ☑
BEST TYPES	POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN UNIMEDIAL LIMESTONE [1]	ONE (<i>Or 2</i> &	QUALI ☐ HEAVY [-2	2]
□□ BOULDER [9] □□ COBBLE [8] □□ GRAVEL [7] □□ SAND [6] □□ BEDROCK [5] NUMBER OF BEST Comments	☐ 3 or less [0] ☐ SHALE [-1]	SILT	☑ MODERAT ☐ NORMAL ☐ FREE [1] ☐ EXTENSIN ☐ MODERAT ☐ NONE [1]	[0]
Comments	☐ COAL FINES [-2]			
quality; 3-Highest quality	EGETATION [1] ROOTWADS [1] AQUATIC MACROPHY	of highest ; large pools. [ERS [1] [TES [1] [Check ONE (Or EXTENSIVE: MODERATE: SPARSE 5-42 NEARLY ABS	2 & average) >75% [11] 25-75% [7] 25% [3]
3] CHANNEL MORPI	HOLOGY Check ONE in each category (<i>Or 2 & average</i>)			
SINUOSITY DE	VELOPMENT CHANNELIZATION STABILITY			
☐ MODERATE [3] ☐ ☑ LOW [2] ☑	EXCELLENT [7] NONE [6] HIGH [3] GOOD [5] RECOVERED [4] MODERATE [2] FAIR [3] RECOVERING [3] LOW [1] POOR [1] RECENT OR NO RECOVERY [1]			Channel 10.0
41 BANK EROSION	AND RIPARIAN ZONE Check ONE in each category for EACH BANK (O.	r 2 per bank	(& average)	
River right looking downstre	$_{f L}^{f R}$ RIPARIAN WIDTH $_{f L}$ R FLOOD PLAIN QUALI	TY LR	- ,	
EROSION NONE / LITTLE [3] MODERATE [2] HEAVY / SEVERE [□ □ WIDE > 50m [4] □ □ FOREST, SWAMP [3] □ □ MODERATE 10-50m [3] □ □ SHRUB OR OLD FIELD [2] □ □ NARROW 5-10m [2] □ □ RESIDENTIAL, PARK, NEW FIELD 1] □ VERY NARROW < 5m [1] □ □ FENCED PASTURE [1] □ □ NONE [0] □ OPEN PASTURE, ROWCROP [0]		CONSERVATION JRBAN OR IND MINING / CONST e predominant lan 00m riparian.	USTRIAL [0] FRUCTION [0]
Comments				laximum 10
5] POOL / GLIDE AN MAXIMUM DEPTH Check ONE (ONLY!)	I CHANNEL WIDTH CHeck ONE (Or 2 & average) CHANNEL that apply		Recreation Primary	Potential
☐ > 1m [6] ☐ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☑ 0.2-<0.4m [1]	☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ TORRENTIAL [-1] ☐ SLOW [1] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ VERY FAST [1] ☐ INTERSTIT ☐ POOL WIDTH > RIFFLE WIDTH [0] ☐ FAST [1] ☐ INTERMIT ☐ MODERATE [1] ☐ EDDIES [1]	TENT [-2]	Secondary (circle one and cor	Contact
☐ < 0.2m [0] Comments	Indicate for reach - pools and rif		٨	Current Maximum 4.0
of riffle-obligate		a popula	tion <u>□ NO R</u>	IFFLE [metric=0]
RIFFLE DEPTH BEST AREAS > 10cm [: BEST AREAS 5-10cm [: BEST AREAS < 5cm [metric=	2] ☐ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2] 1] ☑ MAXIMUM < 50cm [1] ☑ MOD. STABLE (e.g., Large Gravel) [1] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	□ No	N EMBEDDE ONE [2] OW [1] ODERATE [0]	Riffle /
Comments	9	⊔E	XTENSIVE [-1]	Maximum 8
6] GRADIENT (DRAINAGE AREA	ft/mi)	%GLIDE	—	Gradient 6.0

AJ SAMPLED REACH Check ALL that apply	Comment RE: Reach consistency/1	s reach typical of steam?, <i>Recreation</i>	n/Observed - Inferred, Other/	Comment RE: Reach consistency/Is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.	ess directions, etc.
٥					
<u> </u>					
☐ L. LINE ☐ UP ☐ ☐ OTHER ☐ ☐ NORMAL ☐					
DISTANCE DRY					
O.5 Km CLARITY	BJ AESTHETICS	DJ MAINTENANCE	Circle some & COMMENT	EJ ISSUES	F] MEASUREMENTS
1stsample pass 2nd	☐ NUISANCE ALGAE	PUBLIC / PRIVATE / BOTH / NA		WWTP / CSO / NPDES / INDUSTRY	x width
△ 0.12 Km	☐ INVASIVE MACROPHITES	YOUNG-SUCCESSION-OLD		CONTAMINATED / LANDFILL	x depth
Omen	DISCOLORATION	SPRAY / SNAG / REMOVED		BMPs-CONSTRUCTION-SEDIMENT	illax. deptill X bankfull width
meters SECCHI DEPTH	☐ ☐ FOAM / SCUM	MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED		BANK / EROSION / SURFACE	bankfull x depth
CANOPY 1st cm		RELOCATED / CUTOFFS		FALSE BANK / MANURE / LAGOON	W/D ratio
ssed ${}^{\circ}_{\!$	☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS	MOVING-BEDLOAD-STABLE ARMOURED / SLUMPS		WASH H ₂ 0 / TILE / H ₂ 0 TABLE ACID / MINE / QUARRY / FLOW	pankruli max, deptin floodprone x² width
25%-<85% Zud	CSOS/SSOS/OUTFALLS	ISLANDS / SCOURED		NATURAL / WETLAND / STAGNANT	entrench. ratio
SED	CJ RECREATION AREA DEPTH POOL: □>100ft²⊡>3ft	IMPOUNDED / DESICCATED FLOOD CONTROL / DRAINAGE		PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY	Legacy Tree:

Stream Drawing:

S-KP06	Modified Class 1

Primary Headwater Habitat Evaluation Form

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

ADDITIONAL STREAM INFORMATION (This Information Must Also	e Completed):		
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)			
WWH Name: Muhleman Run	Distance from Evaluated Stream	0.75 mi.	
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: New Martinsville	IRCS Soil Map Page: NRCS Soil Map Strea	m Order _	
Manyaa	o / City:Ohio		
MISCELLANEOUS			
Base Flow Conditions? (Y/N):_Y Date of last precipitation:	1/08/19 Quantity: 0.70		
Photograph Information: See Attached Stream Photograph Page			
Elevated Turbidity? (Y/N): N Canopy (% open): 10%			
Were samples collected for water chemistry? (Y/N): (Note lab	ample 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) If not, please explain:			
Additional comments/description of pollution impacts:			
DIOTIO EVALUATION			
BIOTIC EVALUATION			
Performed? (Y/N): (If Yes, Record all observations. Voucher	ollections optional. NOTE: all voucher samples must be	labeled with the site	
	heets from the Primary Headwater Habitat Assessment M	1anual)	
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Ob	erved? (Y/N) N Voucher? (Y/N) N	N	
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquation	Macroinvertebrates Observed? (Y/N) Voucher?	(Y/N)	
Comments Regarding Biology:			



Stream ID <u>S-KP06</u> Date <u>11/11/19</u>



Photograph Number 89
Photograph Direction ENE

Comments:



Photograph Number 90
Photograph Direction NNW

Comments:

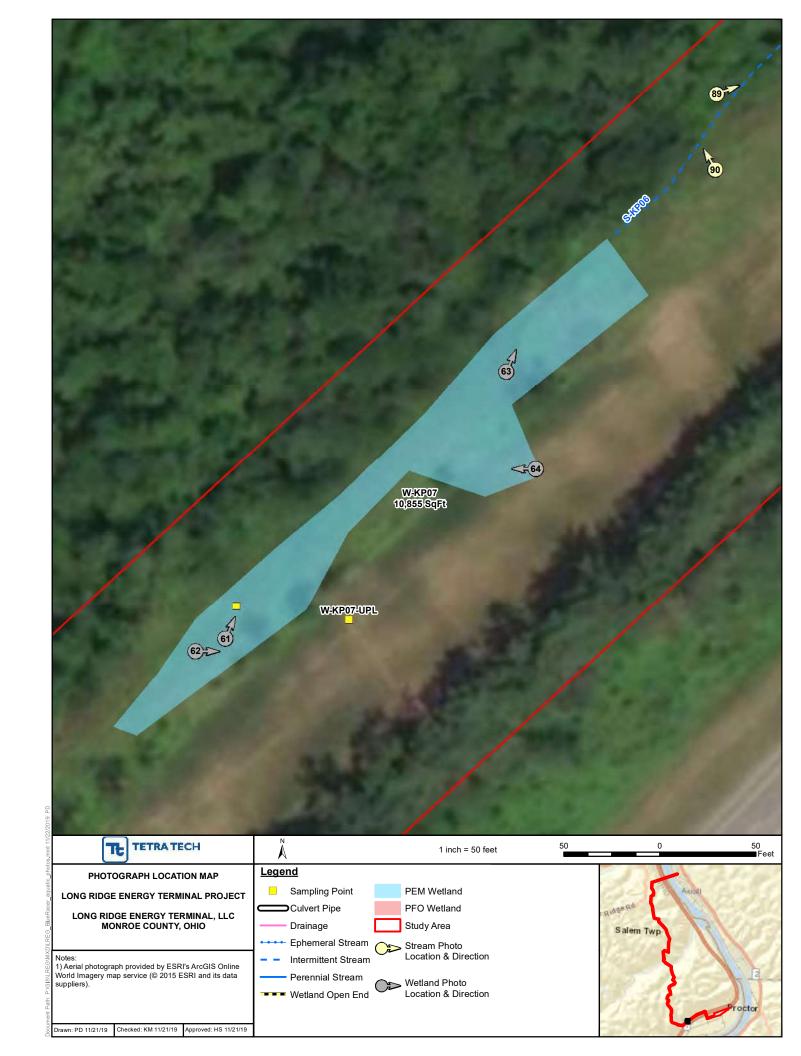


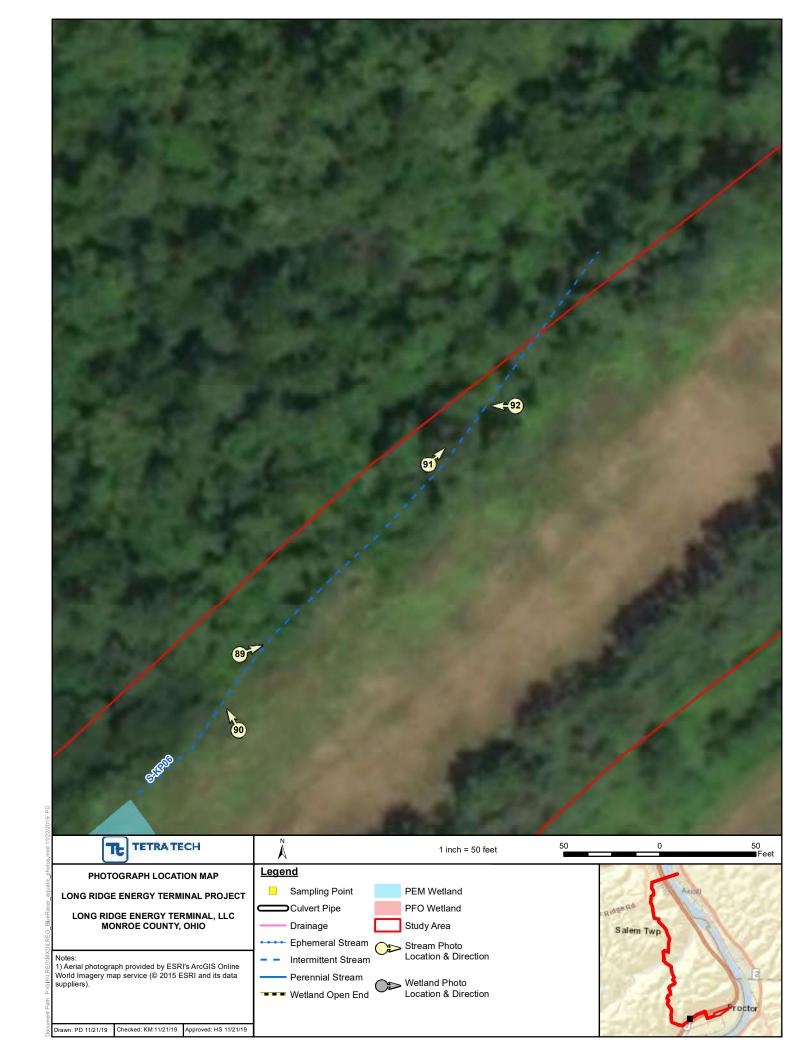
Photograph Number 91
Photograph Direction NE

Comments:



Photograph Number 92
Photograph Direction West





S-KP08	Modified Class 1



Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

THILI Score (sum of metrics 1, 2, 3).	
SITE NAME/LOCATION Long Ridge Energy Terminal Project	2 2 2
Statistical states of the stat	0.20
LENGTH OF STREAM REACH (ft) 350 LAT. 39.70708 LONG80.85105 RIVER CODE RIVER MILE	
DATE 11/11/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Ins	tructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RE	COVERY
MODIFICATIONS: *Modified if Checked*	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT □ □ □ BLDR SLABS [16 pts] 0% □ □ □ SILT [3 pt] 10% □ □ □	Points
BOULDER (>256 mm) [16 pts] LEAF PACK/WOODY DEBRIS [3 pts]	Substrat
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% 25%	Max = 4
OOBBEE (00-200 Hill) [12 ptg]	
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts] 0% 0%	15
Total of Percentages of On ANN (A) Substrate Percentage (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock	ATB
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 3
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS MAXIMUM POOL DEPTH (centimeters): 3	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Max=30
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.61	5
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m	
Moderate 5-10m Infiniative Polest, Shirth of Old Urban or Industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row 0	rop
✓ ✓ None ☐ Fenced Pasture ☐ Mining or Construction	n
COMMENTS_pipeline ROW	_
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermitte	nt)
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	
	-
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0	
0.5 1.5 2.5 3	
STREAM GRADIENT ESTIMATE	
Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe	/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):
QHEI PERFORMED? - Yes / No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Muhleman Run	Distance from Evaluated Stream
CWH Name: _	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe To	wnship / City: Ohio
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/08/19 Quantity: 0.70
Photograph Information: See Attached Stream Photograph Pag	е
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
Were samples collected for water chemistry? (Y/N): N (Note	e 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)	not, please explain:
(· · · / <u></u>	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N	
· /	cher collections optional. NOTE: all voucher samples must be labeled with the sit
	data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamander Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Ac	rs Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	



Stream ID <u>S-KP08</u> Date <u>11/11/19</u>



Photograph Number 93
Photograph Direction WNW

Comments:



Photograph Number 94
Photograph Direction ESE

Comments:

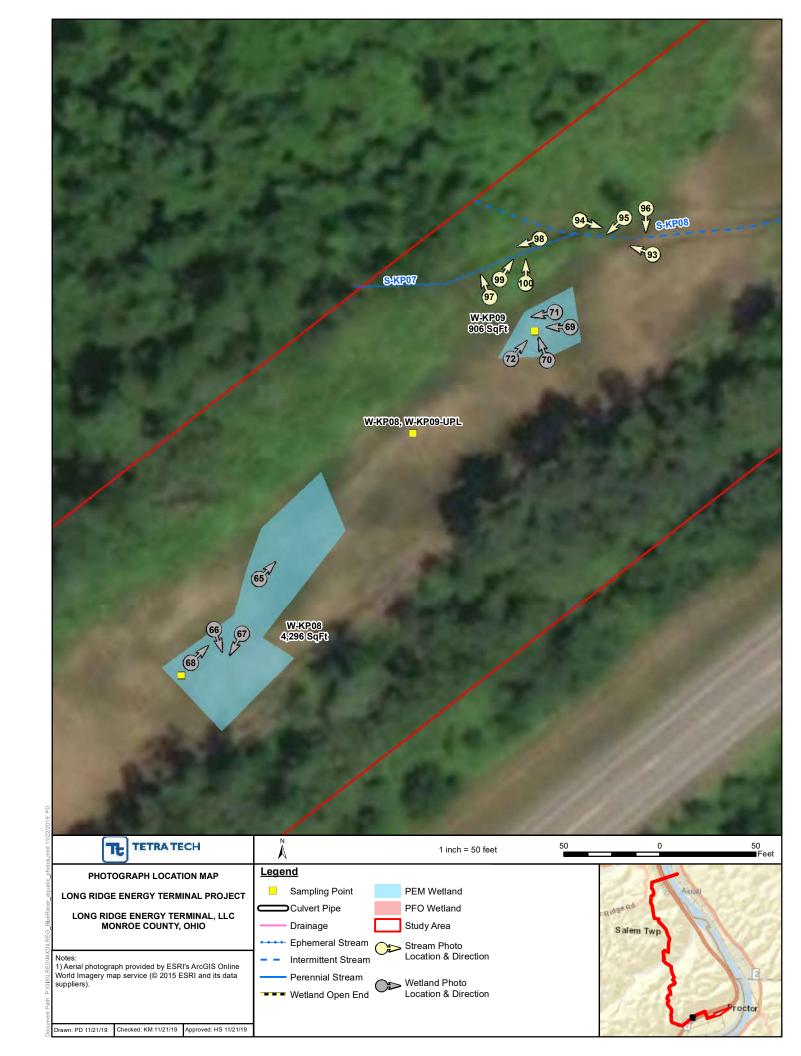


Photograph Number 95
Photograph Direction SW

Comments:



Photograph Number 96
Photograph Direction South



S-KP07	Modified	Clas



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

18

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-KP07 RIVER BASIN Ohio DRAINAGE AREA (mi²)	.10
LENGTH OF STREAM REACH (ft) 70 LAT. 39.70702 LONG80.85162 RIVER CODE RIVER MILE	
DATE 11/11/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
(Max of 52). Add total number of significant substrate types found (Max of 6). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]	Points
BEDROCK [16 pt]	Substrate Max = 40
COBBLE (65-256 mm) [12 pts]	Wax - 40
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts] 0% 0%	13
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	0
COMMENTS MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ (<=3' 3") [5 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.0 m (<=3' 3") [5 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ (<=3' 3") [5 pts]	
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.15 0.15	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ☆	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): This information must also be completed	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ↑ NOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m V 1 In m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 1.0 m (<=3' 3") [5 pts] AVERAGE BANKFULL WIDTH (meters): 0.15 COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.15 L R (Most Predominant per Bank) L R (Most Predominant per Bank) Urban or Industrial	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] ≤ 1.0	Width Max=30
> 4.0 meters (> 13') [30 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field Open Pasture, Row Crown Fenced Pasture COMMENTS pipeline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field PLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS Moderate (Ephemeral) COMMENTS	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Narrow <5m Narrow <5m Residential, Park, New Field Narrow <5m Residential, Park, New Field Open Pasture, Row Crown Fenced Pasture COMMENTS pipeline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH RESIDENT OF THE PROPERTY OF THE PROPE	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Predominant per Bank) Wide >10 m Mature Forest, Wetland Moderate 5-10 m Narrow <5 m Residential, Park, New Field Open Pasture, Row Cro None Flow REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 Check ONLY one box): Check ONLY one box): Open Pasture (Ephemeral) Open Pasture (Intermittent) Open Pasture (Intermitte	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must A	lso be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Muhleman Run	Distance from Evaluated Stream	
CWH Name: _	Distance from Evaluated Stream	
EWH Name:	Distance from Evaluated Stream	
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Tox	wnship / City: Ohio	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/08/19 Quantity: 0.70	
Photograph Information: See Attached Stream Photograph Page	Đ	
Elevated Turbidity? (Y/N): N Canopy (% open): 1	0%	
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	not, please explain:	
, , , , , , , , , , , , , , , , , , ,		
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N		
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit		
ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>S-KP07</u> Date <u>11/11/19</u>



Photograph Number 97
Photograph Direction NNW

Comments:



Photograph Number 98
Photograph Direction WSW

Comments:

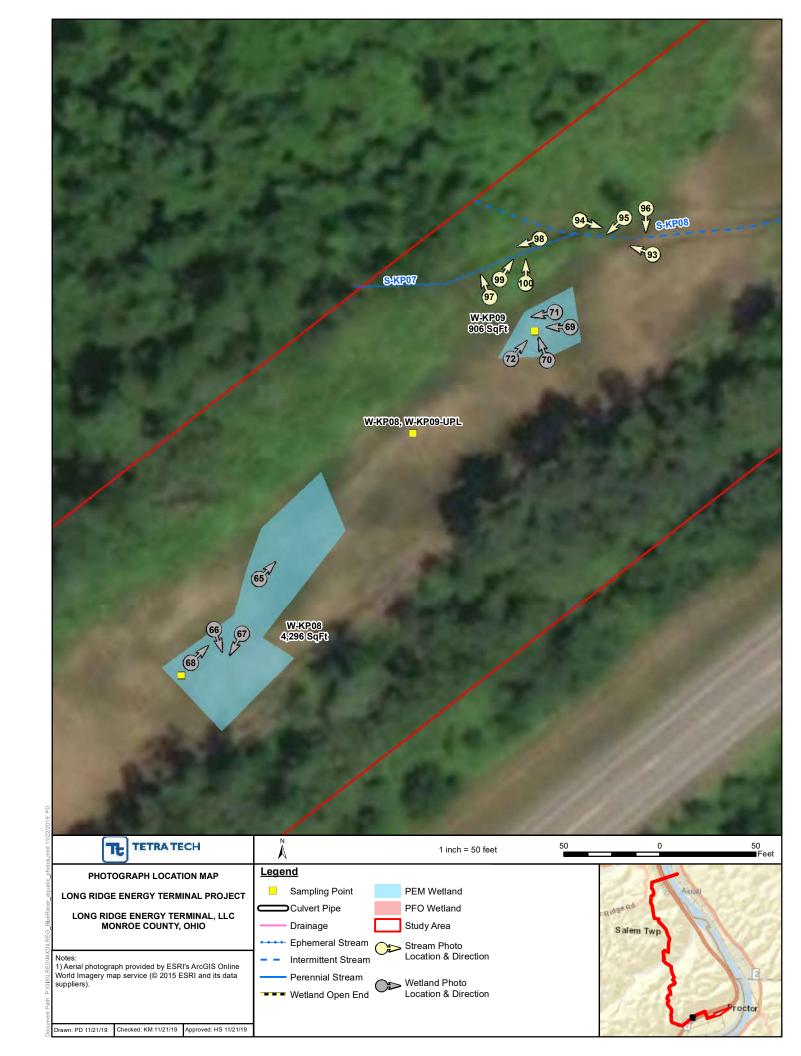


Photograph Number 99
Photograph Direction ENE

Comments:



Photograph Number 100
Photograph Direction North



S-KP10	Modified Class 1



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project SITE NUMBER S-KP10 RIVER BASIN Ohio DRAINAGE AREA (mi²) LENGTH OF STREAM REACH (ft) 126 LAT. 39.70766 LONG80.85039 RIVER CODE RIVER MILE	.07
11/12/19 000000 IMM KMD	
DATE 11/12/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO REC *Modified if Checked*	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHI Meti
TYPE PERCENT TYPE PERCENT □ □ BLDR SLABS [16 pts] 0% □ □ SILT [3 pt] 10%	Poin
BOULDER (>256 mm) [16 pts]	Substi
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% 30% 30%	Max =
COBBLE (65-256 mm) [12 pts]	
SAND (<2 mm) [6 pts] 30% ARTIFICIAL [3 pts] 0%	11
Total of Percentages of 10.00% (A) Substrate Percentage 100% (B)	A + E
Bldr Slabs, Boulder, Cobble, Bedrock	^
Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Pool D Max =
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	l
> 22.5 - 30 cm [30 pts]	₅
	5
COMMENTS MAXIMUM POOL DEPTH (centimeters): 3	
BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bank
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Widt Max=
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	IVIAX-
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30	5
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage	
Immeture Forcet Shrub or Old	
Field Field	
Narrow <5m Residential, Park, New Field Open Pasture, Row Cro	эр
✓ ✓ None ☐ ☐ Fenced Pasture ☐ ☐ Mining or Construction	
COMMENTS old pipeline ROW	-
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent))
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	_
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0	
0.5 1.5 2.5 3	
STREAM GRADIENT ESTIMATE	

ADDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):	
QHEI PERFORMED? - Yes / No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Muhleman Run	Distance from Evaluated Stream	
CWH Name: _	Distance from Evaluated Stream	
EWH Name:	Distance from Evaluated Stream	
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe To	wnship / City: Ohio	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/08/19 Quantity: 0.70	
Photograph Information: See Attached Stream Photograph Pag	е	
Elevated Turbidity? (Y/N): N Canopy (% open):	0%	
Were samples collected for water chemistry? (Y/N): N (Note	e 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)	not, please explain:	
(· · · / <u></u>		
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N		
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit		
	data sheets from the Primary Headwater Habitat Assessment Manual)	
Fish Observed? (Y/N) Voucher? (Y/N) Salamander Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Ac	rs Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>S-KP10</u> Date <u>11/12/19</u>



Photograph Number 101

Photograph Direction South

Comments:



Photograph Number 102
Photograph Direction NW

Comments:



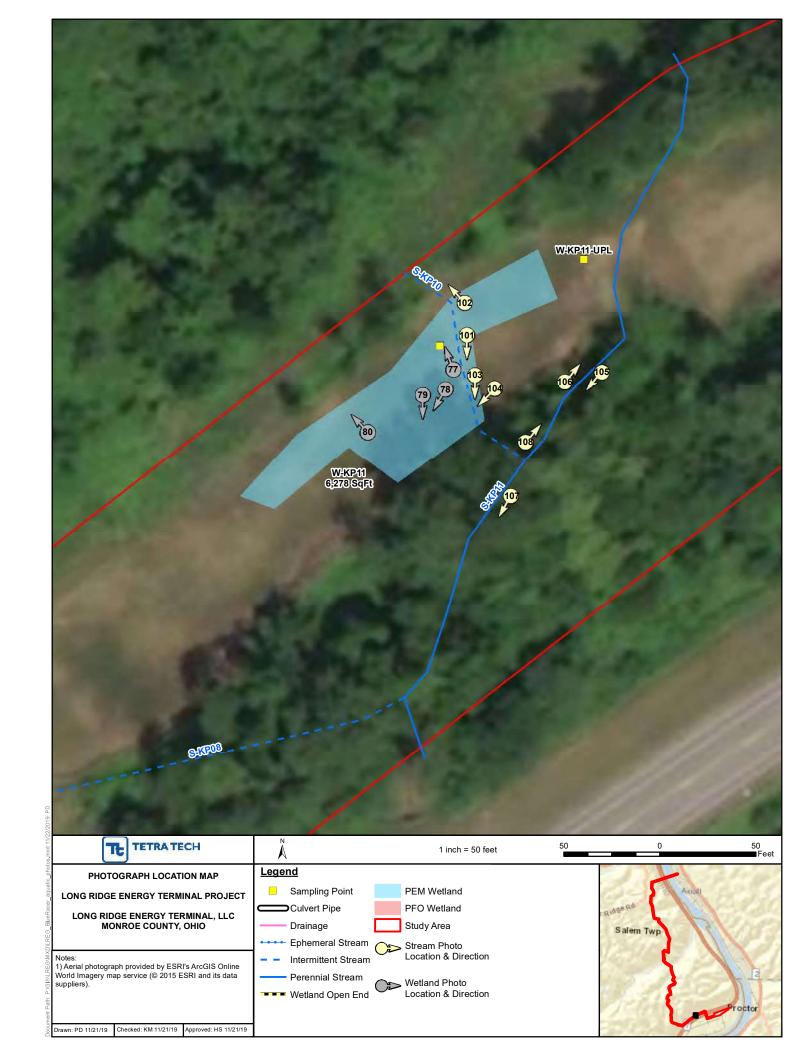
Photograph Number 103

Photograph Direction South

Comments:



Photograph Number 104
Photograph Direction SW



S-KP11	Modified	Cla
5-KP11	woantea	Clas



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project			
SITE NUMBER S-KP11 RIVER BASIN Ohio DRAINAGE AREA (mi²)	.25		
LENGTH OF STREAM REACH (ft) 417 LAT. 39.70760 LONG80.85021 RIVER CODE RIVER MILE			
DATE 11/12/19 SCORER JMM, KMP COMMENTS			
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions		
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY		
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes			
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	HHEI Metric		
□ □ BLDR SLABS [16 pts] □ □ SILT [3 pt] 10%	Points		
BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% 0% 0%	Substrate		
COBBLE (65-256 mm) [12 pts] 10% CLAY or HARDPAN [0 pt] 30%	Max = 40		
GRAVEL (2-64 mm) [9 pts]	11		
SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts] 0%			
Total of Percentages of 10.00% (A) Substrate Percentage Check (B)	A + B		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6 TOTAL NUMBER OF SUBSTRATE TYPES: 5			
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Depth		
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30		
> 30 certaineters [20 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts]			
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	25		
COMMENTS MAXIMUM POOL DEPTH (centimeters): 15			
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull		
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width Max=30		
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] ≤ 1.0 m (<=3' 3") [5 pts]	IVIAX-30		
COMMENTS AVERAGE BANKFULL WIDTH (meters): 1.52	20		
COMMENTS AVERAGE BANKFULL WIDTH (meters): 1.52	20		
This information <u>must</u> also be completed	20		
	20		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\frac{1}{2}\text{NOTE: River Left (L) and Right (R) as looking downstream \$\frac{1}{2}\text{2}}{\frac{1}{2}\text{RIPARIAN WIDTH}} \frac{1}{2}\text{FLOODPLAIN QUALITY}{\text{L R}} \text{(Most Predominant per Bank)} \text{L R}	20		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY *NOTE: River Left (L) and Right (R) as looking downstream *X RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) Wide >10m Mature Forest, Wetland Conservation Tillage	20		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream of RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m This information must also be completed RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Field Urban or Industrial			
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and River Left (
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: RIVER LEFT LEFT LEFT LEFT LEFT LEFT LEFT LEFT			
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field None Residential, Park, New Field Mining or Construction COMMENTS old pipeline ROW			
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY	op		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ♣NOTE: River Left (L) and Right (R) as looking downstream ♣ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Residential, Park, New Field Open Pasture, Row Cre None Residential, Park, New Field Mining or Construction COMMENTS old pipeline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent Dry channel, no water (Ephemeral)	op		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Residential, Park, New Field None COMMENTS old pipeline ROW This information must also be completed RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R (Most Predominant per Bank) L R (Conservation Tillage Immature Forest, Shrub or Old Field Open Pasture, Row Cr Mining or Construction COMMENTS old pipeline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS	op		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ♣NOTE: River Left (L) and Right (R) as looking downstream ♣ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Residential, Park, New Field Open Pasture, Row Cre None Residential, Park, New Field Mining or Construction COMMENTS old pipeline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent Dry channel, no water (Ephemeral)	op		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ARIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Field Narrow <5m Residential, Park, New Field Open Pasture, Row Crombour Comments of pieline ROW FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	op		
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ARIPARIAN WIDTH L R (Per Bank) Wide >10m	ор -		

ADDITIONAL STREAM INFORMATION (This Information Must A	Iso be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Muhleman Run	Distance from Evaluated Stream	
CWH Name:	Distance from Evaluated Stream	
EWH Name:	Distance from Evaluated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Tow	wnship / City: Ohio	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):Y Date of last precipitation:	11/08/19 Quantity: 0.70	
Photograph Information: See Attached Stream Photograph Page)	
Carlopy (% open).	0%	
Were samples collected for water chemistry? (Y/N): (Note	lab sample no. or id. and attach results) Lab Number:	
	pH (S.U.) Conductivity (µmhos/cm)	
Is the sampling reach representative of the stream (Y/N) Y	not, please explain:	
and sumpling reach representative of the stream (TM)	ot, please explain.	
Additional comments/description of pollution impacts:		
PIOTIC EVALUATION		
BIOTIC EVALUATION		
Performed? (Y/N): Note: all voucher samples must be labeled with the sit		
	data sheets from the Primary Headwater Habitat Assessment Manual)	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders	s Observed? (Y/N) N Voucher? (Y/N) N	
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aq	uatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>S-KP11</u> Date <u>11/12/19</u>



Photograph Number 105

Photograph Direction SW

Comments:



Photograph Number 106
Photograph Direction NE

Comments:



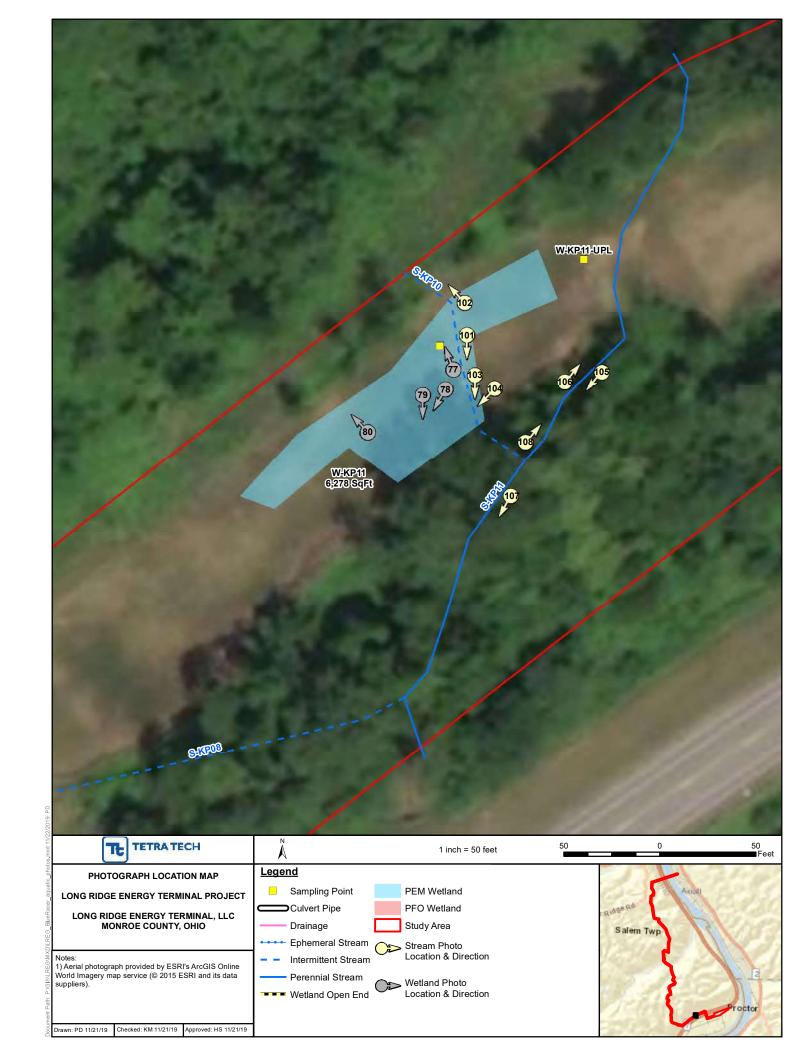
Photograph Number 107

Photograph Direction SSW

Comments:



Photograph Number 108
Photograph Direction NE



S-KP13	Modified Class 1
3-KF 13	INIOUIIICU CIASS I



Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project		
SITE NUMBER S-KP13 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.04	
LENGTH OF STREAM REACH (ft) 56 LAT. 39.70889 LONG80.84744 RIVER CODE RIVER MILE		
DATE 11/12/19 SCORER JMM, KMP COMMENTS		
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru-	ructions	
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	OVERY	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHE	
TYPE PERCENT TYPE PERCENT	Metri	
BLDR SLABS [16 pts]	Point	
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrat Max = 4	
COBBLE (65-256 mm) [12 pts] 30% CLAY or HARDPAN [0 pt] 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	liiux 4	
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts] 0%	25	
Total of Percentages of 45.00% (A) Substrate Percentage 100% (B)	A + B	
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 21 TOTAL NUMBER OF SUBSTRATE TYPES: 4		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Pool Dep Max = 3	
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 5 cm - 30 cm [30 pts] < 5 cm [5 pts]		
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	0	
COMMENTS MAXIMUM POOL DEPTH (centimeters): 0		
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfu	
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Max=30	
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30	5	
This information must also be completed		
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ RIPARIAN WIDTH FLOODPLAIN QUALITY		
L R (Most Predominant per Bank) L R		
☐ Wide >10m ☐ Mature Forest, Wetland ☐ Conservation Tillage ☐ Moderate 5-10m ☐ Immature Forest, Shrub or Old ☐ Urban or Industrial		
Field Open Pasture Row Cr	op	
Narrow <5m Residential, Park, New Field LL	- P	
✓ ✓ None	L	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):		
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools (Interstitial) COMMENTS Dry channel, no water (Ephemeral)	1	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):		
None 1.0 2.0 3.0 3.0 0.5 1.5 2.5 3		
OTDEAN OD ADIENT COTINATE		
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)	00 ft)	

ADDITIONAL STREAM INFORMATION (This Information Must A	lso be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)		
WWH Name: Muhleman Run	Distance from Evaluated Stream	
CWH Name: _	Distance from Evaluated Stream	
EWH Name:	Distance from Evaluated Stream	
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order	
County: Monroe Tox	wnship / City: Ohio	
MISCELLANEOUS		
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/08/19 Quantity: 0.70	
Photograph Information: See Attached Stream Photograph Page	Đ	
Elevated Turbidity? (Y/N): N Canopy (% open): 1	0%	
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	not, please explain:	
, , , , , , , , , , , , , , , , , , ,		
Additional comments/description of pollution impacts:		
BIOTIC EVALUATION		
N		
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit		
ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N)	
Comments Regarding Biology:		



Stream ID <u>S-KP13</u> Date <u>11/12/19</u>



Photograph Number 109
Photograph Direction NNE

Comments:



Photograph Number 110
Photograph Direction SSW

Comments:



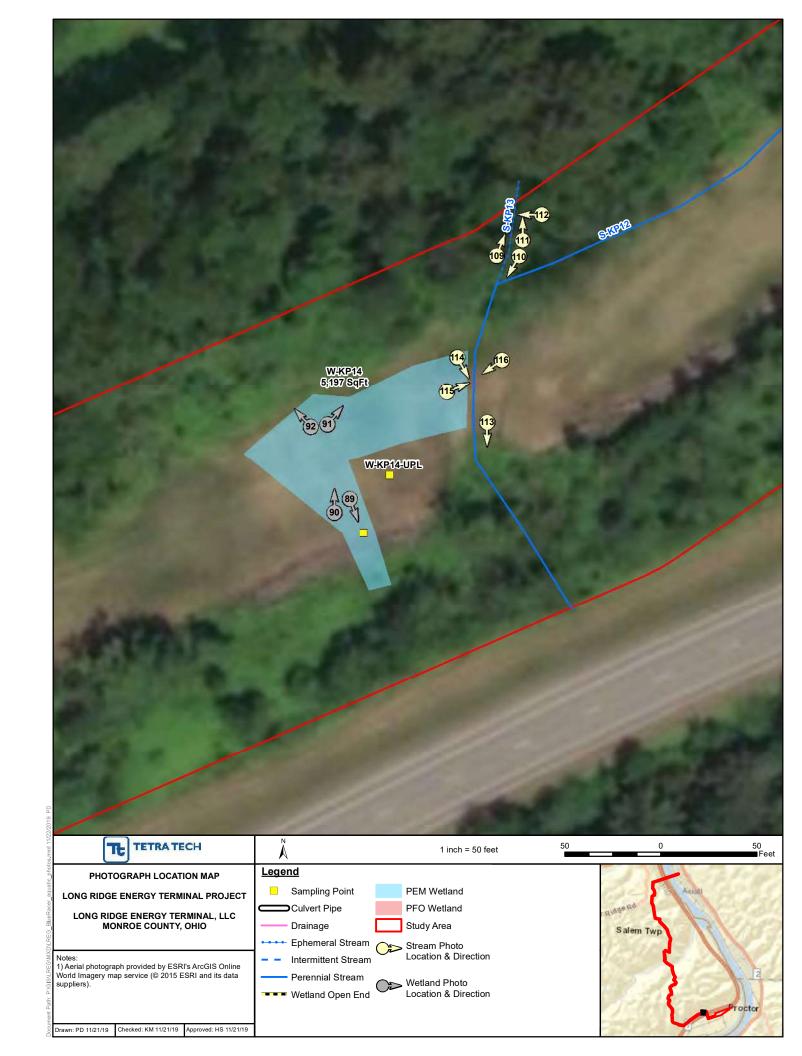
Photograph Number 111

Photograph Direction North

Comments:



Photograph Number 112
Photograph Direction West



S-KP12	Modified	Cla
3-KP12	ivioaiiiea	Cla



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project SITE NUMBER S-KP12 RIVER BASIN Ohio DRAINAGE AREA (mi²) 0.25				
LENGTH OF STREAM REACH (ft) 470 LAT. 39.70887 LONG80.84729 RIVER CODE RIVER MILE				
DATE 11/12/19 SCORER JMM, KMP COMMENTS				
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions			
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO REC *Modified if Checked*	OVERY			
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	HHEI			
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric			
BLDR SLABS [16 pts]	Points			
BEDROCK [16 pt]	Substrat			
COBBLE (65-256 mm) [12 pts] 30% CLAY or HARDPAN [0 pt] 5%	Max = 40			
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] MUCK [0 pts] ARTIFICIAL [3 pts] 0% 0%	27			
Total of Percentages of 45.00% (A) Substrate Percentage 100% (B)	A + B			
Bldr Slabs, Boulder, Cobble, Bedrock				
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dep			
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30			
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	45			
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	15			
COMMENTS MAXIMUM POOL DEPTH (centimeters): 8				
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful			
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): This information must also be completed	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.91	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.91 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH L R (Per Bank) L R (Most Predominant per Bank) Wide >10m Mature Forest, Wetland Conservation Tillage	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ↑ RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m S 1.0 m (<=3' 3") [5 pts] ✓ ≤ 1.0 m (<=3' 3") [5 pts] L R (VICTION OF THE INTERPOLATION	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Narrow <5m Residential, Park, New Field Open Pasture, Row Cro	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream ANOTE: River Le	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): O.91 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆ NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH ELOODPLAIN QUALITY Under the proof of	Width Max=30			
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ ≤ 1.0 m (<=3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Width Max=30			
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ∴ NOTE: River Left (L) and Right (R) as looking downstream ∴ RIPARIAN WIDTH L R (Per Bank) Wide >10m Mature Forest, Wetland Moderate 5-10m Moderate 5-10m Residential, Park, New Field Fenced Pasture COMMENTS S 1.0 m (<=3' 3") [5 pts] ✓ 1.0 m (<=3' 3") [5 pts] AVERAGE BANKFULL WIDTH (meters): 0.91 L R (No.91) AVERAGE BANKFULL WIDTH (meters): 0.91 L R (No.91) AVERAGE BANKFULL WIDTH (meters): 0.91 L R (No.91) No.91 AVERAGE BANKFULL WIDTH (meters): (No.91) AVERAGE BANKFULL WID	Width Max=30			
S 3.0 m -4.0 m (> 9' 7" - 13") [25 pts]	Width Max=30			
S 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] S 1.0 m (<=3' 3") [5 pt	Width Max=30			
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH RIPARIAN WIDTH RIPARIAN Wide >10m Moderate 5-10m Narrow <5m Narrow <5m Narrow <5m Residential, Park, New Field Residential, Park, New Field Flow REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 None 1.0 SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 None 1.0 COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.91 AVERAGE BANK	Width Max=30			

ADDITIONAL STREAM INFORMATION (This Information Must A	lso be Completed):			
QHEI PERFORMED? - Yes ✓ No QHEI Score	(If Yes, Attach Completed QHEI Form)			
DOWNSTREAM DESIGNATED USE(S)				
WWH Name: Muhleman Run	Distance from Evaluated Stream			
CWH Name: _	Distance from Evaluated Stream			
EWH Name:	Distance from Evaluated Stream			
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION				
USGS Quadrangle Name: New Martinsville	NRCS Soil Map Page: NRCS Soil Map Stream Order			
County: Monroe Tox	wnship / City: Ohio			
MISCELLANEOUS				
Base Flow Conditions? (Y/N):Y Date of last precipitation:_	11/08/19 Quantity: 0.70			
Photograph Information: See Attached Stream Photograph Page				
Elevated Turbidity? (Y/N): N Canopy (% open): 10%				
Were samples collected for water chemistry? (Y/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) If not, please explain:				
, , , , , , , , , , , , , , , , , , ,				
Additional comments/description of pollution impacts:				
BIOTIC EVALUATION				
N				
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)				
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N)			
Comments Regarding Biology:				



Stream Photograph Page

Stream ID <u>S-KP12</u> Date <u>11/12/19</u>



Photograph Number 113

Photograph Direction South

Comments:



Photograph Number 114

Photograph Direction SSE

Comments:



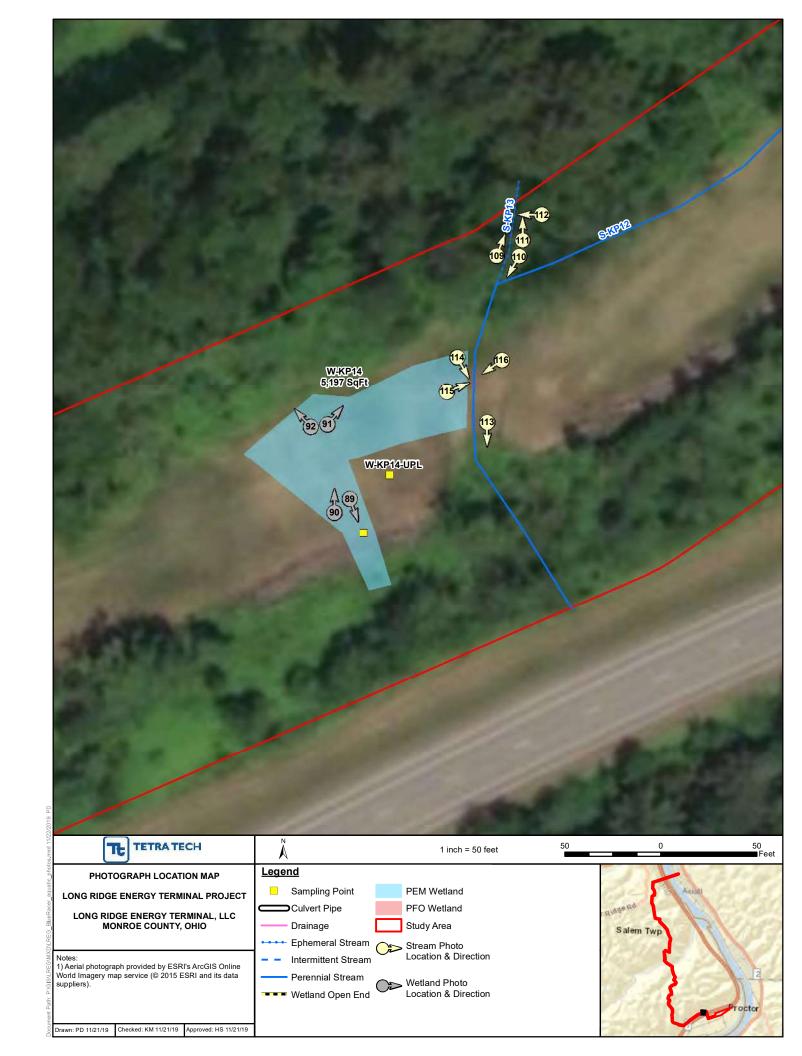
Photograph Number 115

Photograph Direction ENE

Comments:



Photograph Number 116
Photograph Direction SW



S-KP14	
S-KP14	

Modified Class 2



Chief Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Long Ridge Energy Terminal Project	
SITE NUMBER S-KP14 RIVER BASIN Ohio DRAINAGE AREA (mi²)	0.08
LENGTH OF STREAM REACH (ft) 150 LAT. 39.70878 LONG80.84670 RIVER CODE RIVER MILE	
DATE 11/12/19 SCORER JMM, KMP COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED *Modified if Checked*	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	ı HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metri
BLDR SLABS [16 pts] 0% SILT [3 pt] 15%	Point
BOULDER (>256 mm) [16 pts]	Substrat
COBBLE (65-256 mm) [12 pts] 15% CLAY or HARDPAN [0 pt] 10%	Max = 4
✓ GRAVEL (2-64 mm) [9 pts] 35% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	21
Total of Percentages of 20.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 6	
	De al Dan
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Pool Dep Max = 3
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	5
COMMENTS MAXIMUM POOL DEPTH (centimeters): 3	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankful
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Wiax-30
COMMENTSAVERAGE BANKFULL WIDTH (meters): 0.30	5
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage	
Wide >10m	
Field Open Pasture Row C	rop
Narrow < 5m Residential, Park, New Field D	·
None LL Fenced Pasture LL Mining or Construction COMMENTS	1
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermitten Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	t)
COMMENTS COMMENTS	1
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0 ✓ 0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE	
Flat (0.5 ft/100 ft) Flat to Moderate Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe Severe (10 ft/	100 ft)

ADDITIONAL STREAM INFORMATION (This Information N	flust Also be Completed):
QHEI PERFORMED? - Yes V No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Muhleman Run	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Monroe	Township / City: Ohio
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipital	· - · · · · · · · · · · · · · · · · · ·
Photograph Information: See Attached Stream Photograph	h Page
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
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 (m	ng/l) pH (S.U.) Conductivity (μmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y	If not, please explain:
, , , , , , , , , , , , , , , , , , , ,	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
N	
(/ (b. Voucher collections optional. NOTE: all voucher samples must be labeled with the site of the field data sheets from the Primary Headwater Habitat Assessment Manual)
	N N
Fish Observed? (Y/N) N Voucher? (Y/N) N Salam Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-	

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):

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



Stream Photograph Page

Stream ID <u>S-KP14</u> Date <u>11/12/19</u>



Photograph Number <u>117</u>
Photograph Direction <u>NW</u>

Comments:



Photograph Number 118
Photograph Direction SSW

Comments:

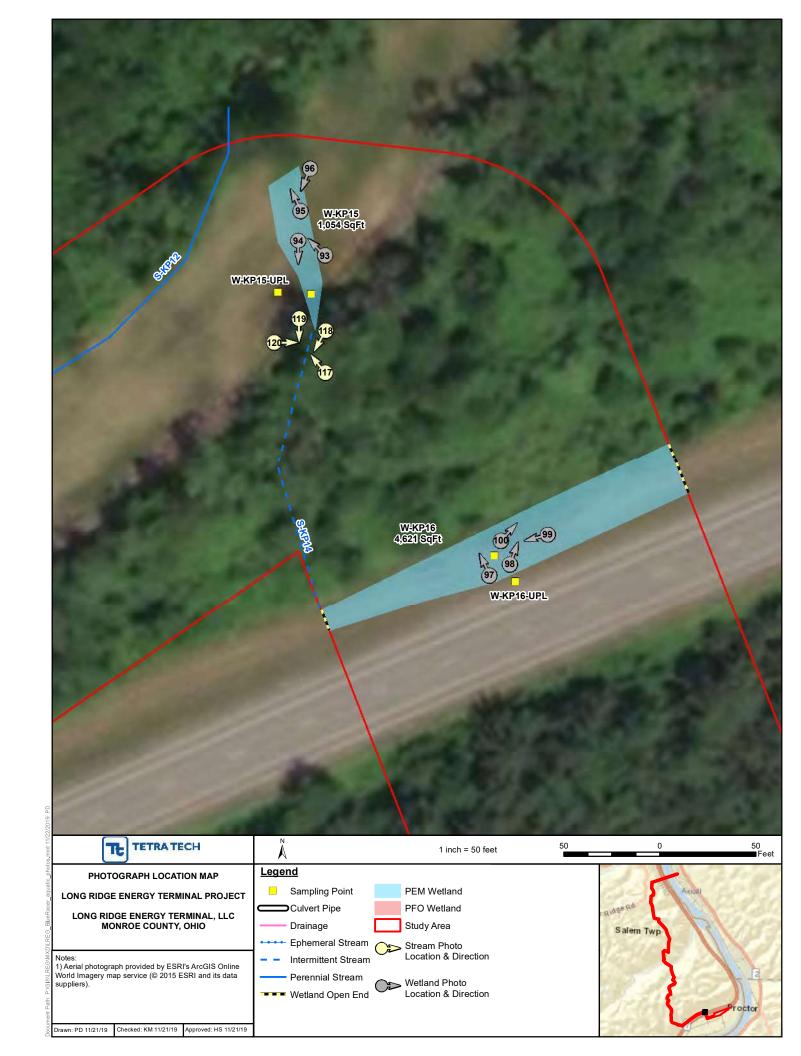


Photograph Number 119
Photograph Direction South

Comments:



Photograph Number 120
Photograph Direction East





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 69.0

Stream & Location:	Ohio River,	Monroe County	, Ohio (S-JM01)	_RM:	Date: 11/12	2/2019
			_Scorers Full N	Name & Affiliation:	Jason McC	Guirk; Tetra Tec	<u>h</u>
River Code:	-	_ <i>STORET #:</i>	<i>Lat./</i> - — — — (NAD 83	/ Long.:			office verified location □
BEST TYPES	ate % or note POOL RIFFLE 0% 0% 0% 0% 0% 10% 0% 30% 0% 10% 0% 0% 0% 0% ∇YPES: □ 4	every type present OTHER TYF HARDPAN DETRITUS MUCK [2] SILT [2] ARTIFICIA	PES POOL RIFFLI [4] 20% 0% [5] 0% 0% 0% 25% 0% L [0] 0% 0% ural substrates; ignor	Check (ORIGIN LIMESTONE [1] TILLS [1] WETLANDS [0] HARDPAN [0] SANDSTONE [0] E RIP/RAP [0]	SILT	average) QUALITY HEAVY [-2] MODERATE [- NORMAL [0] FREE [1] EXTENSIVE [- MODERATE [- NORMAL [0] NONE [1]	21] Substrate
2] INSTREAM COVE quality; 3-Highest quality i diameter log that is stable 0 UNDERCUT BANK 2 OVERHANGING VE 0 SHALLOWS (IN SL 0 ROOTMATS [1] Comments	quality; 2-N n moderate or , well develope S [1] EGETATION [7	or greater amounts, be greater amounts (e. ed rootwad in deep / POOLS = ROOTW	ut not of highest qu.g., very large bould fast water, or deep > 70cm [2]0	ality or in small amounts lers in deep or fast water	of highest ; large pools. ERS [1]	Check ONE (Or 2 & EXTENSIVE >75° MODERATE 25-7 SPARSE 5-<25% NEARLY ABSEN	average) % [11] 5% [7] [3] T <5% [1]
☐ HIGH [4] ☑ E ☐ MODERATE [3] ☐ G ☑ LOW [2] ☐ F	HOLOGY CR VELOPMEN EXCELLENT [7 GOOD [5] PAIR [3]	IT CHANNE 7]	ELIZATION ED [4]	STABILITY HIGH [3] MODERATE [2] LOW [1]		Cha Maxir	
4] BANK EROSION A River right looking downstree EROSION DOWNSTREE NONE / LITTLE [3] DOWNSTREE NODERATE [2] DOWNSTREE Comments	RIP. R WIDE	ARIAN WIDTH E > 50m [4] ERATE 10-50m [3] ROW 5-10m [2] Y NARROW < 5m [1	FLC ROPE FOREST, SHRUB O RESIDENT FENCED	OOD PLAIN QUALI	TY R C C C C C C C C C C C C C C C C C C	ONSERVATION TIL RBAN OR INDUST IINING / CONSTRU	RIAL [0] CTION [0] Se(s) Arian
5] POOL / GLIDE AN MAXIMUM DEPTH Check ONE (ONLY!) □ > 1m [6] □ 0.7-<1m [4] □ 0.4-<0.7m [2] □ 0.2-<0.4m [1] □ < 0.2m [0] Comments	CH Check POOL WII	VRUN QUALITY ANNEL WIDTH ONE (Or 2 & averag OTH > RIFFLE WIDT OTH = RIFFLE WIDT OTH > RIFFLE WIDT	CU (re) (1) (H [2]	I INTERMIT	TIAL [-1] TENT [-2]]		ontact t on back)
Indicate for function of riffle-obligate RIFFLE DEPTH BEST AREAS > 10cm [2] BEST AREAS 5-10cm [1] BEST AREAS < 5cm [metric=0] Comments 6] GRADIENT (species: RUN] ☑ MAXIM] □ MAXIM	Ch I DEPTH F UM > 50cm [2]	neck ONE (<i>Or</i> 2 & <i>a</i> RIFFLE / RUN \$ STABLE (e.g., Cob MOD. STABLE (e.g JNSTABLE (e.g., Fi	SUBSTRATE RIF	FLE / RUN □ NO □ LO □ MO	MO RIFFI EMBEDDEDN ONE [2] W [1] DERATE [0] TENSIVE [-1] Maxin	fiffle / 1.0
DRAINAGE	\	MODERATE [6-10]	•	=	%GLIDE. %RIFFLE:	Maxii	100

Stream Drawing:

Stream Photograph Page

Stream ID <u>S-JM01</u> Date <u>11/12/201</u>9



Photograph Number 121
Photograph Direction NE

Comments:



Photograph Number 122
Photograph Direction East

Comments:



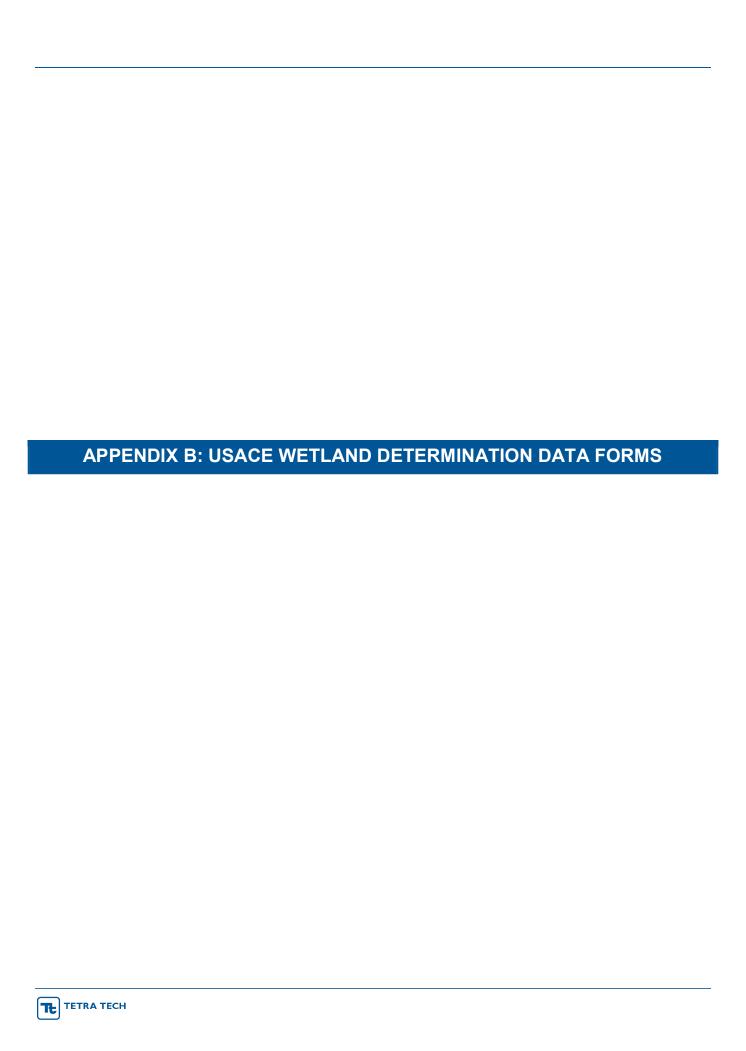
Photograph Number 123
Photograph Direction SE

Comments:



Photograph Number 124
Photograph Direction East





Project/Site: Long Ridge Energy Pip	dge Energy Pipeline City/County: Monroe Sampling Date: 11/06				Sampling Date: 11/06/19	
	icant/Owner: Long Ridge Energy Terminal, LLC					
nvestigator(s): KMM, WJ Section, Township, Range: N/A						
andform (hillslope, terrace, etc.): Hillslope terrace Local relief (concave, convex, none): Concave Slope (%): 1-3						
Subregion (LRR or MLRA): LRRN Lat: 39.745837 Long: -80.871736 Datum: NAD 83						
Soil Map Unit Name: Guernsey-Upshur						
Are climatic / hydrologic conditions on the	site typical f	or this time of year? Y	′es √ No	(If no, explain in R	emarks.)	
Are Vegetation, Soil, or Hy	drology	significantly distur	bed? Are "Normal	l Circumstances" p	oresent? Yes No	
Are Vegetation, Soil, or Hy						
SUMMARY OF FINDINGS – Atta			•	•	•	
Hydrophytic Vegetation Present?	Yes ✓	No				
Hydric Soil Present?	Yes ✓	No	Is the Sampled Area	y ./		
Wetland Hydrology Present?	Yes ✓	No	within a Wetland?	Yes	No	
Remarks: Cowardin Code: PEM		HGM: Slope	Water Type:	RPWWN		
HYDROLOGY						
Wetland Hydrology Indicators:				Secondary Indica	tors (minimum of two required)	
Primary Indicators (minimum of one is re	quired; chec	k all that apply)		Surface Soil	<u> </u>	
✓ Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave S						
High Water Table (A2)		Hydrogen Sulfide Od		Drainage Pa		
Saturation (A3)	✓	Oxidized Rhizosphere	es on Living Roots (C3)	Moss Trim L	nes (B16)	
					Water Table (C2)	
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8)					rows (C8)	
				sible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	_	Other (Explain in Rer	marks)		tressed Plants (D1)	
Iron Deposits (B5)				✓ Geomorphic Position (D2)		
Inundation Visible on Aerial Imagery	(B7)			Shallow Aqu		
Water-Stained Leaves (B9)				Microtopographic Relief (D4) ✓ FAC-Neutral Test (D5)		
Aquatic Fauna (B13)				<u>▼</u> FAC-Neutral	Test (D5)	
Field Observations:	NI.	Danish (Salahara)	3			
Surface Water Present? Yes ✓	No	Depth (inches): Depth (inches):				
Saturation Present? Yes (includes capillary fringe)	No <u></u>	_ Depth (inches):	Wetland F	Hydrology Preser	nt? Yes <u>√</u> No	
Describe Recorded Data (stream gauge,	monitoring	well, aerial photos, pre	vious inspections), if ava	ilable:		
Remarks:	iotina infil	tration pooling of	water on the curfee	•		
Heavy compacted clay layer restr	icung inili	tration, pooling of	water on the surfact	e.		

	plants.		Sampling Point: W-WJKM01
Absolute	Dominant	Indicator	Dominance Test worksheet:
% Cover	Species?	<u>Status</u>	Number of Dominant Species
			That Are OBL, FACW, or FAC:1 (A)
			Total Number of Dominant
			Species Across All Strata:1 (B)
			Percent of Dominant Species
			That Are OBL, FACW, or FAC: 100% (A/B)
			Prevalence Index worksheet:
			Total % Cover of: Multiply by:
			OBL species x1 =
20% of	total cover:		FACW species x 2 =
			FAC species x 3 =
			FACU species x 4 =
			UPL species x 5 =
			Column Totals: (A) (B)
			Column Totals (A) (B)
			Prevalence Index = B/A =
			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
20% 01	total cover:		data in Remarks or on a separate sheet)
70	./	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
			¹ Indicators of hydric soil and wetland hydrology must
		1 40 11	be present, unless disturbed or problematic.
			Definitions of Four Vegetation Strata:
			Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
			more in diameter at breast height (DBH), regardless of
			height.
			Sapling/Shrub – Woody plants, excluding vines, less
			than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
			m) tall.
90			Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
			of size, and woody plants less than 3.20 it tall.
			Woody vine – All woody vines greater than 3.28 ft in
			height.
			Hydrophytic Vegetation
			Hydrophytic Vegetation Present? Yes✓_ No
	0 20% of 70 15 5	0 = Total Cover. 20% of total cover: 0 = Total Cover. 20% of total cover: 70 ✓ 15 5 90 = Total Cover.	0 = Total Cover 20% of total cover: 0 0 = Total Cover 20% of total cover: 0 70 ✓ FACW 15 FACU 5 FACW 90 = Total Cover 20% of total cover: 18

nches)	Matrix Color (moist)	%	Color (moist)	<u>x Features</u> %	Type ¹	Loc ²	Texture	Remarks
0-4	10YR 4/2	95	7.5YR 4/6	5	C	M/PL	SICL	Kemaks
<u>4-18 </u>	10YR 4/1	90_	7.5YR 4/6	10_	<u>C</u>	M/PL	C	
-								-
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked	Sand Gra	ins.		L=Pore Lining, M=Matrix.
	Indicators:		D 10 f	(07)				ators for Problematic Hydric Soils ³
Histosol	(A1) pipedon (A2)		Dark Surface Polyvalue Be		o (CO) (M	I DA 147		2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16)
Black Hi			Polyvalue Be				140) ((MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye			-17, 140)	F	Piedmont Floodplain Soils (F19)
	Layers (A5)		✓ Depleted Mar		-,			(MLRA 136, 147)
	ick (A10) (LRR N)		Redox Dark					/ery Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Dar				_ (Other (Explain in Remarks)
	ark Surface (A12)	DD N	Redox Depre			DD 11		
-	lucky Mineral (S1) (L \ 147, 148)	.KK N,	Iron-Mangan		es (F12) (I	RK N,		
	Gleyed Matrix (S4)		Umbric Surfa	•	MLRA 13	6. 122)	³ Inc	dicators of hydrophytic vegetation and
-	ledox (S5)		Piedmont Flo					etland hydrology must be present,
-	Matrix (S6)		Red Parent N					lless disturbed or problematic.
	_ayer (if observed):							
, <u> </u>	ompacted Clay							_
							Hydric Soi	l Present? Yes <u>√</u> No
Depth (ind	ches): <u>4"</u>						•	
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
Depth (ind	ches): 4"							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							
	ches): <u>4"</u>							

Wetland Photograph Page

Wetland ID W-WJKM01 Cowardin Code PEM Date 11/06/19



Photograph Number 1
Photograph Direction North

Comments:



Photograph Number 2
Photograph Direction East

Comments:



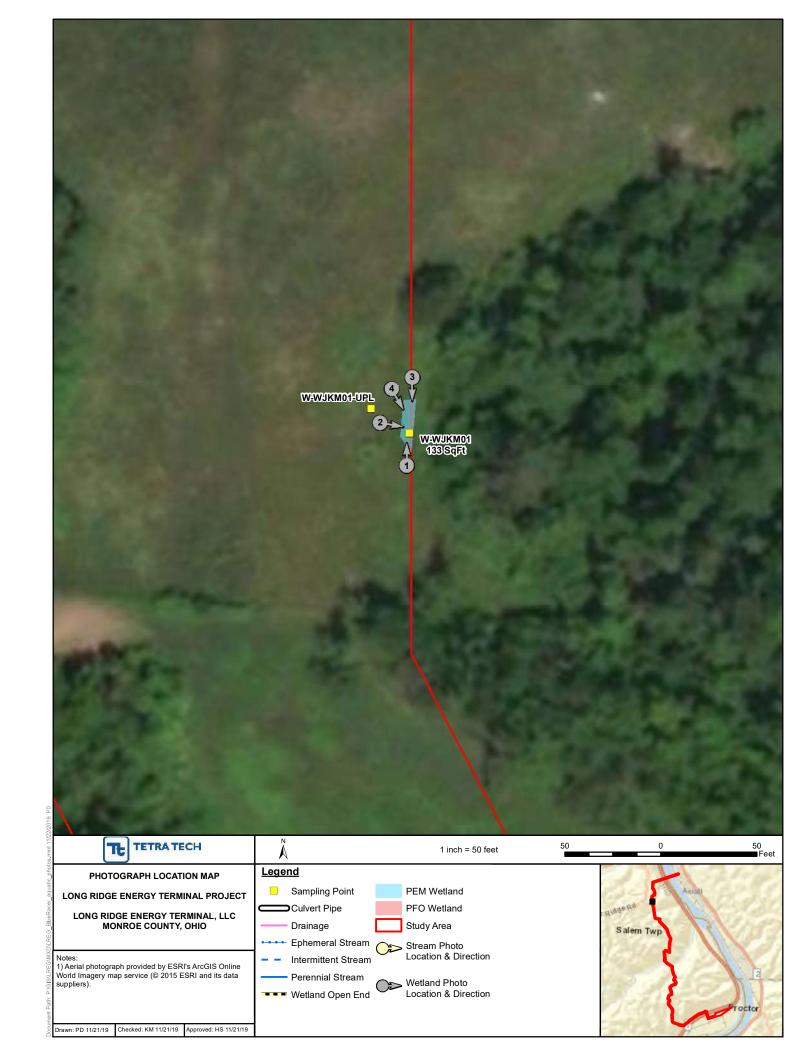
Photograph Number 3
Photograph Direction South

Comments:



Photograph Number 4

Photograph Direction SE



Project/Site: Long Ridge Energy Pipe	eline	City/County: Monroe		Sampling Date: 11/06/19
Applicant/Owner: Long Ridge Energy	Terminal, LLC		State: OH	Sampling Point: W-WJKM01-UPL
Investigator(s): KMM, WJ		Section, Township, Range: N		
Landform (hillslope, terrace, etc.): Hillslo				Slope (%): 1-3
Subregion (LRR or MLRA): LRRN				Datum: NAD 83
Soil Map Unit Name: Guernsey-Upshur				
Are climatic / hydrologic conditions on the				
				į.
Are Vegetation, Soil, or Hy				
Are Vegetation, Soil, or Hy	drology naturally p	roblematic? (If needed,	explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Atta	ach site map showin	g sampling point locati	ons, transects	, important features, etc.
Hydrophytic Vegetation Present?	Yes No_ √			
	Yes No ✓	Is the Sampled Area	V	
	Yes No ✓	- within a Wetland?	res	NO
Remarks: Cowardin Code: UPLA		Water Type:		
Cowardin Code. Of Ex	AND HOM.	water type.		
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	tors (minimum of two required)
Primary Indicators (minimum of one is red	quired; check all that apply		Surface Soil	Cracks (B6)
Surface Water (A1)	True Aquatic I	Plants (B14)	Sparsely Veg	getated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulf	fide Odor (C1)	Drainage Pat	tterns (B10)
Saturation (A3)	Oxidized Rhiz	ospheres on Living Roots (C3)	Moss Trim Li	nes (B16)
Water Marks (B1)	Presence of R	deduced Iron (C4)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Recent Iron R	eduction in Tilled Soils (C6)	Crayfish Buri	rows (C8)
Drift Deposits (B3)	Thin Muck Su			sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain	n in Remarks)		tressed Plants (D1)
Iron Deposits (B5)	(5-1)		Geomorphic	· · · · · · · · · · · · · · · · · · ·
Inundation Visible on Aerial Imagery	(B7)		Shallow Aqui	
Water-Stained Leaves (B9) Aquatic Fauna (B13)			Microtopogra	
Field Observations:			FAC-Neutral	Test (D5)
	No Depth (inche	٥١٠		
	No✓ Depth (inches			
	No <u>✓</u> Depth (inches		Hydrology Procon	nt? Yes No✓
(includes capillary fringe)	No• Deptil (iliche:	s) vvetialiu	nyulology Flesen	it: lesNov
Describe Recorded Data (stream gauge,	monitoring well, aerial photo	tos, previous inspections), if av	ailable:	
Remarks:				
Nemarks.				
İ				1

Sampling	Point:	W-W	JKM0	1-U	ΙPΙ
----------	--------	-----	------	-----	-----

0.01	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				
3				Total Number of Dominant Species Across All Strata: 2 (B)
4				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:0% (A/B)
6				Prevalence Index worksheet:
7				
	0	= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:0	20% of	total cover:	0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1				FAC species x 3 =
2				FACU species x 4 =
				UPL species x 5 =
3				Column Totals: (A) (B)
4				Goldmin Totals: (T)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
·	0	= Total Cov		3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0		total cover:	_	4 - Morphological Adaptations ¹ (Provide supporting
<u></u>	20 /6 01	total cover.		data in Remarks or on a separate sheet)
TIEID Stratuiii (Fiot Size)	O.E.	,	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
1. Phleum pratense	25			
2. Dactylis glomerata	30		FACU_	¹ Indicators of hydric soil and wotland hydrology must
3. Solidago canadensis	15		FACU_	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. Asclepias syriaca	15		UPL	Definitions of Four Vegetation Strata:
5. Barbarea vulgare	15		FACU	Definitions of Four Vegetation Strata.
•			· · <u></u>	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
		-		more in diameter at breast height (DBH), regardless of
7		-		height.
8		-		Sapling/Shrub – Woody plants, excluding vines, less
9		-		than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50		total cover		
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than 3.28 ft in
· · · · · · · · · · · · · · · · · ·				height.
1		-		
2		-		
3				
4				Hydrophytic
5				Vegetation
	0	= Total Cov	er	Present? Yes No
50% of total cover:0	20% of	total cover	0	
Remarks: (Include photo numbers here or on a separate s	heet.)			
` '	,			

Profile Desc	ription: (Describe t	o the depth r	needed to docum	ent the ir	ndicator o	or confirm	the abs	sence of indicate	ors.)	
Depth	Matrix		Redox	<u>Features</u>			_		_	
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	Textu		Remarks	
<u> </u>	10YR 3/4	100					SI	<u> </u>		_
	_									_
										_
										_
										_
										_
	ncentration, D=Deple	etion, RM=Re	duced Matrix, MS	=Masked	Sand Gra	ins.		on: PL=Pore Lini		
Hydric Soil I	ndicators:							Indicators for Pi	roblematic Hy	dric Soils ³ :
Histosol		=	Dark Surface				,		A10) (MLRA 1	
	ipedon (A2)	=	Polyvalue Be		. , .		148)		Redox (A16)	
Black His		-	Thin Dark Su			47, 148)		(MLRA 14		(540)
	n Sulfide (A4) Layers (A5)	-	Loamy Gleye Depleted Mat		-2)			Pleamont Fig (MLRA 13	oodplain Soils	(F19)
	ck (A10) (LRR N)	_	Redox Dark S		3)				v Dark Surface	(TF12)
	Below Dark Surface	(A11)	Depleted Dar				•		in in Remarks	' '
	rk Surface (A12)		Redox Depre				•			
	ucky Mineral (S1) (L l	RR N,	Iron-Mangane		s (F12) (L	RR N,				
	. 147, 148)		MLRA 136					2		
	leyed Matrix (S4)	=	Umbric Surfa					³ Indicators of h		I
	edox (S5)	-	Piedmont Flo					wetland hydro		I
	Matrix (S6) ayer (if observed):	_	Red Parent M	iateriai (F∠	21) (WLR/	4 127, 147	') 	unless disturb	ed or problem	alic.
	.ayer (ii observeu).									
Type:	shoot.		-				Livedei	e Cail Draggmt2	Vaa	No ✓
	:hes):		_				пушт	c Soil Present?	Yes	. NO <u>▼</u>
Remarks:										

Project/Site: Long Ridge Energy Pipeline	City/C	ounty: Monroe		Sampling Date: 11/06/19
Applicant/Owner: Long Ridge Energy Term		,		Sampling Point: W-WJKM02
	Section	n. Township. Range: N/		
Landform (hillslope, terrace, etc.): Floodplain				Slope (%): 2-4
Subregion (LRR or MLRA): LRRN				
Soil Map Unit Name: Gilpin-Upshur silt loams,				
Are climatic / hydrologic conditions on the site typi				
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology			xplain any answe	•
SUMMARY OF FINDINGS – Attach si	te map showing sam	pling point locatio	ns, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes	✓ No			
Hydric Soil Present? Yes	,	Is the Sampled Area within a Wetland?	Voc. ✓	No
Wetland Hydrology Present? Yes	✓ No	within a wettand:	ies <u> </u>	
Remarks: Cowardin Code: PEM	HGM: Riverine	Water Type: I	RPWWD	
HYDROLOGY				
Wetland Hydrology Indicators:				ators (minimum of two required)
Primary Indicators (minimum of one is required;			Surface Soil	
Surface Water (A1)	True Aquatic Plants (I			getated Concave Surface (B8)
✓ High Water Table (A2)	Hydrogen Sulfide Odd		Drainage Pa	
✓ Saturation (A3)	✓ Oxidized Rhizosphere	= : :	Moss Trim L	
Water Marks (B1)	Presence of Reduced	` '	-	Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction		Crayfish Bur	
Drift Deposits (B3)	Thin Muck Surface (C			isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Ren	narks)	_	tressed Plants (D1)
Iron Deposits (B5)				Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu	
Water-Stained Leaves (B9) Aquatic Fauna (B13)			✓ FAC-Neutral	aphic Relief (D4)
			▼ FAC-Neutral	rest (D5)
Field Observations: Surface Water Present? Yes No	✓ Depth (inches):			
	Depth (inches):	3		
	Depth (inches):	0 Wetlend U	luduala mu Duaaa	nt? Yes ✓ No
Saturation Present? Yes <u>▼</u> No _ (includes capillary fringe)	Depth (inches):	vvetiand H	iyarology Presei	nt? Yes <u>√</u> No
Describe Recorded Data (stream gauge, monitor	ring well, aerial photos, pre	vious inspections), if avai	ilable:	
Remarks:				
Remarks.				

'EGETATION (Four Strata) – Use scientifi	c names of	plants.		Sampling Point: W-WJKM02
20'	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30')		Species?		Number of Dominant Species That Are ORL FACW or FAC: 4 (A)
1 2				matric obt, i row, or roo (A)
3				Total Number of Dominant Species Across All Strata: 4 (B)
4				Cpcolect to local time diama.
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/E
6				That Ale OBL, FACW, OF FAC.
7				Prevalence Index worksheet:
		= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:		total cover	_	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1. Sambucus nigra	5	✓	FACW	FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				
6		-	· 	Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
				✓ 2 - Dominance Test is >50%
9		= Total Cov		3 - Prevalence Index is ≤3.0 ¹
50% of total cover:				4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')	2070 01	total cover	·	data in Remarks or on a separate sheet)
1. Poa trivialis	25	✓	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Impatiens capensis			FACW	
3. Hydrophyllum virginianum			FAC	¹ Indicators of hydric soil and wetland hydrology must
4 Boehmeria cylindrica		<u> </u>	FACW	be present, unless disturbed or problematic.
·· <u> </u>			171011	Definitions of Four Vegetation Strata:
5				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) c
6				more in diameter at breast height (DBH), regardless o
7				height.
8				Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
50% of total cover:		= Total Cov		of size, and woody plants less than 3.28 ft tall.
	20% of	total cover	14	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size: 15')				height.
1				
2				
3				
4				Hydrophytic
5				Vegetation No.
		= Total Cov	_	Present? Yes <u>√</u> No
50% of total cover:		total cover		
Remarks: (Include photo numbers here or on a separa	ate sheet.)			

Depth	Matrix			K Features	1	- 3				
(inches)	Color (moist)	<u>%</u>	Color (moist)		Type ¹	Loc ²	Texture	· -	Remarks	
8-0	10YR 6/1	95	7.5YR 4/6	5	C	M/PL	SICL			
8+									Refusa	
						- —		-		
ype: C=Cc	ncentration, D=Depl	etion, RM=R	educed Matrix, MS	S=Masked S	Sand Gr	ains.	² Location: F	L=Pore Lin	ing, M=Matrix.	
	ndicators:	,	,						roblematic Hy	dric Soils ³ :
_ Histosol	(A1)		Dark Surface	(S7)			2	2 cm Muck ((A10) (MLRA 1 4	47)
	ipedon (A2)		Polyvalue Be		(S8) (N	ILRA 147,			e Redox (A16)	,
Black His			Thin Dark Su					(MLRA 1	47, 148) `	
_ Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (F2	2)		F	Piedmont Fl	oodplain Soils ((F19)
_ Stratified	Layers (A5)		✓ Depleted Mat	rix (F3)				(MLRA 1	36, 147)	
	ck (A10) (LRR N)		Redox Dark S	` '	•				w Dark Surface	
_	Below Dark Surface	(A11)	Depleted Dar	•			(Other (Expla	ain in Remarks)	
	rk Surface (A12)		Redox Depre							
	ucky Mineral (S1) (L	RR N,	Iron-Mangane		(F12) (LRR N,				
	147, 148)		MLRA 136	•			3.			
	leyed Matrix (S4)		Umbric Surfa						ydrophytic veg	
	edox (S5)		Piedmont Flo					-	ology must be p	
	Matrix (S6)		Red Parent M	laterial (F21	1) (MLR	A 127, 147) ur	iless disturb	ped or problema	atic.
	.ayer (if observed):									
	rge cobble								,	
Depth (inc	:hes): <u>8</u>		_				Hydric Soi	I Present?	Yes <u></u> ✓	No
emarks:							_			

Wetland Photograph Page

Wetland ID W-WJKM02 Cowardin Code PEM Date 11/06/19



Photograph Number <u>5</u>
Photograph Direction West

Comments:



Photograph Number 6
Photograph Direction SE

Comments:

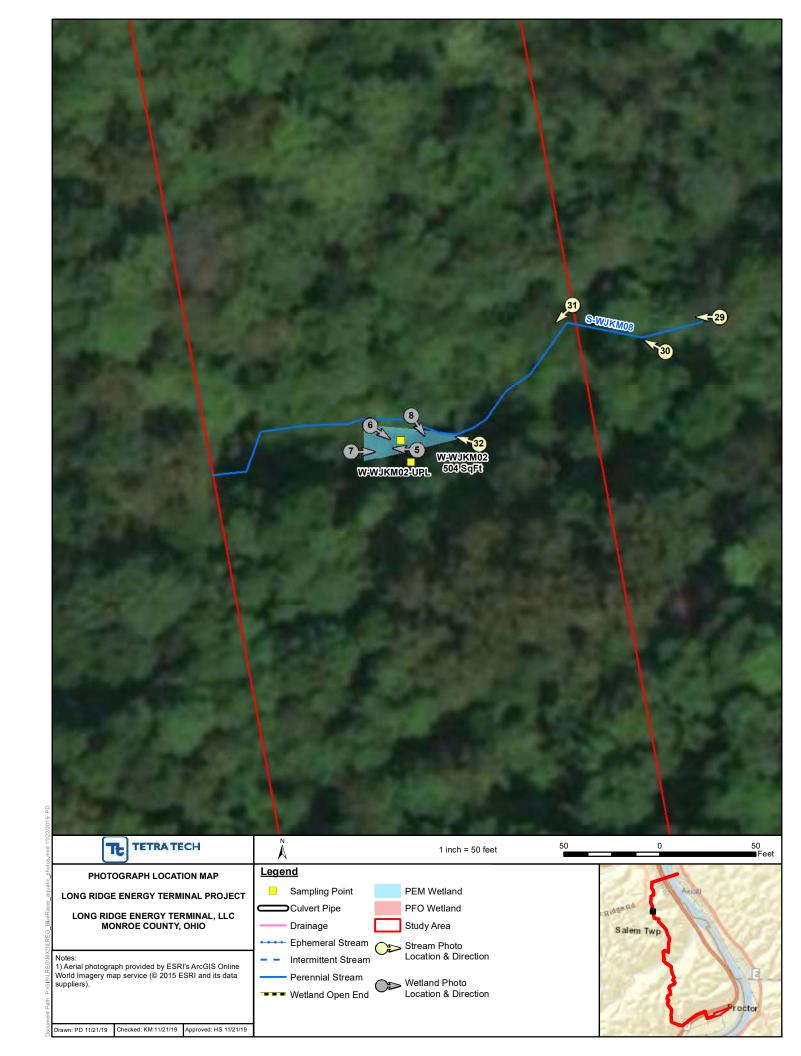


Photograph Number 7
Photograph Direction East

Comments:



Photograph Number 8
Photograph Direction SE



Project/Site: Long Ridge E	Energy Pip	eline		City/County:	Monroe		Sampling Date: 11/06/19
Applicant/Owner: Long Rid	lge Energ						Sampling Point: W-WJKM02-UPI
Investigator(s): KMM, WJ				Section, Tov	vnship, Range: N		
Landform (hillslope, terrace, e							Slope (%): 2-4
Subregion (LRR or MLRA)	LRRN	l at					Datum: NAD 83
					_		cation: N/A
Are climatic / hydrologic cond							
				-			present? Yes No
Are Vegetation, Soil _						explain any answe	
							s, important features, etc.
SOMMANT OF FINDIN	103 - All	acii Sile ii	nap Shown	ig samping	j politi locatio	Jiis, transects	s, important reatures, etc.
Hydrophytic Vegetation Pres	sent?	Yes		- Is the	Sampled Area		
Hydric Soil Present?		Yes	,		n a Wetland?	Yes	No <u>√</u>
Wetland Hydrology Present	?	Yes	No ✓	_			
Remarks: Cowardin C	Code: UPL	.AND	HGM:		Water Type:		
HYDROLOGY							
Wetland Hydrology Indica							ators (minimum of two required)
Primary Indicators (minimun	n of one is re	equired; chec				Surface Soil	
Surface Water (A1)				Plants (B14)			egetated Concave Surface (B8)
High Water Table (A2)		_		ılfide Odor (C1)		_	atterns (B10)
Saturation (A3) Water Marks (B1)				zospneres on L Reduced Iron (iving Roots (C3)	Moss Trim L	Water Table (C2)
Sediment Deposits (B2))			Reduced Iron (Reduction in Til		Crayfish Bu	
Drift Deposits (B3)	,		Thin Muck S		100 00113 (00)	-	/isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)				in in Remarks)			Stressed Plants (D1)
Iron Deposits (B5)						Geomorphic	Position (D2)
Inundation Visible on A	erial Imagery	/ (B7)				Shallow Aqu	uitard (D3)
Water-Stained Leaves ((B9)						aphic Relief (D4)
Aquatic Fauna (B13)						FAC-Neutra	l Test (D5)
Field Observations:	V	N = 1	Danth (in ab.				
Surface Water Present?				es): es):			
Water Table Present? Saturation Present?				es):	Wetland	Judralagu Brasa	nt? Yes No_ ✓
(includes capillary fringe)	res	NO <u>_</u>	_ Deptii (inche	es)	vvetiand	nyarology Prese	ntr res No
Describe Recorded Data (st	ream gauge	, monitoring	well, aerial pho	otos, previous i	nspections), if ava	ailable:	
Remarks:							
Nomana.							

Sampling	Point:	W-WJKM	02-UPL
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	Absolute	Dominant	Indicator	Dominance Test worksheet:	\neg
<u>Tree Stratum</u> (Plot size:)		Species?		Number of Dominant Species	
1 Fagus grandifolia	20	✓	FACU	That Are OBL, FACW, or FAC: 0 (A)	
2 Acer saccharum	15	<i>√</i>	FACU	(1)	
<u>-</u> -		·	1 700	Total Number of Dominant	
3				Species Across All Strata: 4 (B)	
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC: 0% (A/B	3)
6				(1) Indit 10 OBE, 1710W, 011710.	"
7.				Prevalence Index worksheet:	
1	35			Total % Cover of: Multiply by:	
17.1		= Total Cov		OBL species x 1 =	
50% of total cover:17.	20% of	total cover	r:/		
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =	
1. Fagus grandifolia	5		FACU_	FAC species x 3 =	
2				FACU species x 4 =	
3.				UPL species x 5 =	
				Column Totals: (A) (B)	١
4		-		(A)(D)	'
5				Prevalence Index = B/A =	
6					_
7				Hydrophytic Vegetation Indicators:	
				1 - Rapid Test for Hydrophytic Vegetation	
8				2 - Dominance Test is >50%	
9				3 - Prevalence Index is ≤3.0 ¹	
		= Total Cov		4 - Morphological Adaptations ¹ (Provide supporting	10
50% of total cover: 2.5	20% of	f total cover	: <u> </u>		9
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)	
1. Polystichum acrostichoides	15	✓	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)	
2				¹ Indicators of hydric soil and wetland hydrology must	
3				be present, unless disturbed or problematic.	
4				Definitions of Four Vegetation Strata:	-
5				Dominiono or rour rogotation otrata.	
				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) of	
				more in diameter at breast height (DBH), regardless o	f
7				height.	
8				Sapling/Shrub – Woody plants, excluding vines, less	
9				than 3 in. DBH and greater than or equal to 3.28 ft (1	
10.				m) tall.	
11					
11.	15			Herb – All herbaceous (non-woody) plants, regardless	3
7.5		= Total Cov	_	of size, and woody plants less than 3.28 ft tall.	
50% of total cover: <u>7.5</u>	20% of	f total cover	:3	Woody vine – All woody vines greater than 3.28 ft in	
Woody Vine Stratum (Plot size:15')				height.	
1					
2					
3					
4				Hydrophytic	
5				Vegetation	
	0	= Total Cov	ver	Present? Yes No _✓	
50% of total cover:0	20% of	f total cover	r: <u> </u>		
Remarks: (Include photo numbers here or on a separate s	heet.)			1	\dashv
Tromano. (includo prioto hamboro noto or on a coparate o	11001.7				
					1

Profile Desc	ription: (Describe t	o the depth r	eeded to docun	nent the ir	ndicator o	r confirm	the abs	sence of indicat	ors.)	
Depth	Matrix		Redo	K Features		. , ,	_		_	
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	Textu		Remarks	
<u> </u>	10YR 4/4	100					SI	<u> </u>		_
	_		_							_
										_
	ncentration, D=Deple	etion, RM=Re	duced Matrix, MS	=Masked	Sand Gra	ins.		on: PL=Pore Lin		
Hydric Soil I	ndicators:							Indicators for P	roblematic H	ydric Soils³:
Histosol		-	Dark Surface						A10) (MLRA 1	
	ipedon (A2)	_	Polyvalue Be		. , .		148)		e Redox (A16))
Black His		-	Thin Dark Su			47, 148)		(MLRA 14		(510)
	n Sulfide (A4) Layers (A5)	=	Loamy Gleye		-2)		•		oodplain Soils	(F19)
	ck (A10) (LRR N)	=	Depleted Mat Redox Dark \$		3)			(MLRA 1:	v Dark Surface	(TF12)
	Below Dark Surface	(A11)	Depleted Dar				•		in in Remarks	` '
	rk Surface (A12)	. , _	 Redox Depre				•	` ` '		<i>'</i>
Sandy M	ucky Mineral (S1) (L	RR N,	Iron-Mangane	ese Masse	s (F12) (L	.RR N,				
	147, 148)		MLRA 130							
	leyed Matrix (S4)	_	Umbric Surfa					³ Indicators of h		
	edox (S5)	=	Piedmont Flo						ology must be	
	Matrix (S6)		Red Parent M	laterial (F2	21) (MLR/	A 127, 147	7)	unless disturb	ed or problem	natic.
	.ayer (if observed):									
Type:			=				l			/
	:hes):		_				Hydri	c Soil Present?	Yes	
Remarks:										

Project/Site: Long Ridge Energy Pipeline	City/County: Monroe		Sampling Date: 11/08/19
Applicant/Owner: Long Ridge Energy Terminal, LLC			_ Sampling Point: W-WJKM03
Investigator(s): KMM, WJ	Section, Township, Range: N		
Landform (hillslope, terrace, etc.): Shallow swale	Local relief (concave, convex, no	one): Concave	Slope (%): 0-3%
Subregion (LRR or MLRA): LRRN Lat: 39.726			Datum: NAD 83
Soil Map Unit Name: Guernsey-Upshur complex, 18 to 70 pe			
Are climatic / hydrologic conditions on the site typical for this time	of year? Yes No	(If no, explain in Re	marks.)
Are Vegetation, Soil, or Hydrology signific	cantly disturbed? Are "Norma	al Circumstances" pr	esent? Yes <u>√</u> No
Are Vegetation, Soil, or Hydrology natura	.lly problematic? (If needed,	explain any answers	s in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	wing sampling point locati	ons, transects,	important features, etc.
Hydrophytic Vegetation Present? Hydric Soil Present? Wes Yes No No Wetland Hydrology Present? Yes No No	io the campion in ou		_ No
Remarks: Cowardin Code: PEM HGM: S	Slope Water Type:	· DD\\\\\\\\	
Wetland receives flow from upland ditch that workspace. Flow is conveyed to S-WJKM15 outside		ound the perime	ter of their operational
HYDROLOGY			
Wetland Hydrology Indicators:		·-	ors (minimum of two required)
✓ High Water Table (A2)	atic Plants (B14) I Sulfide Odor (C1) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) on Reduction in Tilled Soils (C6) k Surface (C7) Iplain in Remarks) Inches): 3 Inches): 0 Inches Inch	Drainage Patt Moss Trim Lin Dry-Season W Crayfish Burro Saturation Vis Stunted or Str Geomorphic F Shallow Aquit Microtopograp FAC-Neutral T	etated Concave Surface (B8) erns (B10) les (B16) Vater Table (C2) lows (C8) lible on Aerial Imagery (C9) lessed Plants (D1) Position (D2) lard (D3) lohic Relief (D4) Test (D5)
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspections), if av	ailable:	
Remarks:			

/EGETATION (Four Strata) – Use scientific n	ames of	plants.		Sampling Point: W-WJKM03
001	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')	·	Species?		Number of Dominant Species That Are OBL, FACW, or FAC:2 (A)
2.				
3				Total Number of Dominant Species Across All Strata: 2 (B)
4				Species Across All Strata (B)
т 5.				Percent of Dominant Species That Are OBL FACW or FAC: 100% (A/B)
•				That Are OBL, FACW, or FAC: 100% (A/B)
6 7				Prevalence Index worksheet:
·	0	= Total Cov		Total % Cover of: Multiply by:
50% of total cover: 0				OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1				FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
r				
5 6.				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
				✓ 1 - Rapid Test for Hydrophytic Vegetation
8				✓ 2 - Dominance Test is >50%
9	0	= Total Cov		3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0			_	4 - Morphological Adaptations (Provide supporting
Herb Stratum (Plot size: 5')		10101 00101		data in Remarks or on a separate sheet)
1. Phalaris arundinaceae	50	✓	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Typha latifolia	25	√	OBL	
3. Scirpus cyperinus	15	. <u> </u>	FACW	¹ Indicators of hydric soil and wetland hydrology must
4. Eupatorium perfoliatum	10		FACW	be present, unless disturbed or problematic.
5. Lonicera japonica	5		FACU	Definitions of Four Vegetation Strata:
6. Solidago gigantea	5		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7.				more in diameter at breast height (DBH), regardless of height.
, 8				neight.
9.				Sapling/Shrub – Woody plants, excluding vines, less
40				than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
10 11				
··· <u> </u>		= Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 55	20% of	total cover:	22	or size, and woody plante less than 6.26 it tall.
Woody Vine Stratum (Plot size: 15')	_			Woody vine – All woody vines greater than 3.28 ft in
1				height.
2.				
3				
4				
5				Hydrophytic Vegetation
-	^	= Total Cov	er	Present? Yes No
50% of total cover:0		total cover:	_	
Remarks: (Include photo numbers here or on a separate s	heet.)			1
	,			

(Inches)	Matrix Color (moist)	%	Redo Color (moist)	x Features	ype ¹ Loc ²	Texture	Remarks
(inches) 0-2	10YR 4/2	95	7.5YR 4/6		D M/PL	SIL	Remarks
2-18	10YR 4/1	90_	7.5YR 4/6	100	<u> M/PL</u>	SICL	
					_		
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked Sa	and Grains.		L=Pore Lining, M=Matrix.
ydric Soil I							ators for Problematic Hydric Soils ³ :
_ Histosol			Dark Surface		(00) (14) 54 44		2 cm Muck (A10) (MLRA 147)
	nipedon (A2)				(S8) (MLRA 147	, 148) (Coast Prairie Redox (A16)
Black His	n Sulfide (A4)		Loamy Gleye		ILRA 147, 148)		(MLRA 147, 148) Piedmont Floodplain Soils (F19)
	l Layers (A5)		✓ Depleted Ma	, ,		'	(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark			\	/ery Shallow Dark Surface (TF12)
	l Below Dark Surface	e (A11)	Depleted Dar		7)		Other (Explain in Remarks)
_ Thick Da	rk Surface (A12)		Redox Depre	ssions (F8)			
	lucky Mineral (S1) (L	.RR N,			(F12) (LRR N,		
	\ 147, 148)		MLRA 13	•		3	
	leyed Matrix (S4)				.RA 136, 122)		licators of hydrophytic vegetation and
	edox (S5)				(F19) (MLRA 1		etland hydrology must be present,
	Matrix (S6) ayer (if observed):		Red Parent N	nateriai (FZ1)	(MLRA 127, 14	<i>(</i>) un	less disturbed or problematic.
	ayer (ii observed).					1	
Туре:						Hadria Cail	I Duna aut 2 Van 🗸 Na
Type: Depth (inc			<u> </u>			Hydric Soil	Present? Yes <u>√</u> No
Type: Depth (inc			<u> </u>			Hydric Soi	Present? Yes No
Type: Depth (inc			_			Hydric Soil	Present? Yes <u>√</u> No
Type: Depth (inc			_			Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type:						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Туре:						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes ✓ No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes No

Wetland Photograph Page

Wetland ID W-WJKM03 Cowardin Code PEM Date 11/08/19



Photograph Number 9
Photograph Direction NW

Comments:



Photograph Number 10
Photograph Direction SE

Comments:



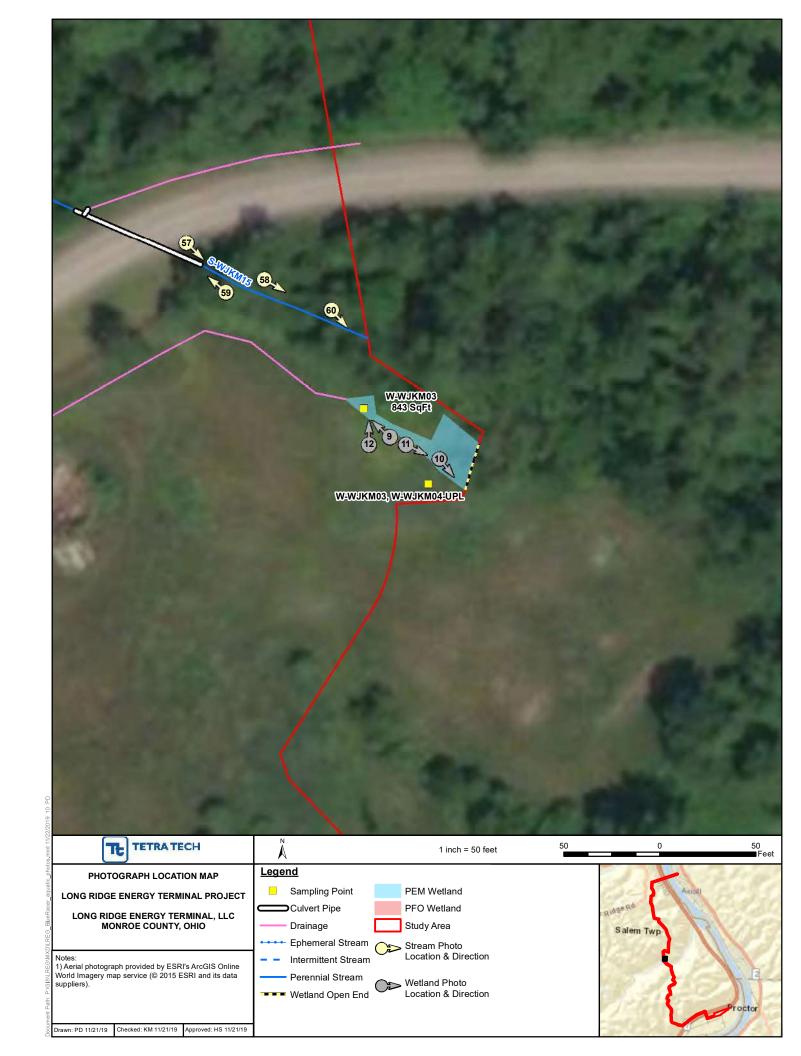
Photograph Number 11
Photograph Direction ESE

Comments:



Photograph Number 12
Photograph Direction North

3:			



Project/Site: Long Ridge Energy Pipeline Cit	y/County: Monroe Sampling Date: 11/06/19								
•	State: PA Sampling Point: WJKM03, Sampling Point: WJKM04-UPL**								
Investigator(s): KMM, WJ Section, Township, Range: N/A									
• ()	relief (concave, convex, none): Concave Slope (%): 0-3								
	Long: -80.864940 Datum: NAD 83								
Soil Map Unit Name: Guernsey-Upshur complex, 18 to 70 percent slo									
Are climatic / hydrologic conditions on the site typical for this time of year?									
Are Vegetation, Soil, or Hydrology significantly dis									
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)									
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.									
Hydrophytic Vegetation Present? Yes No_ ✓									
Hydric Soil Present? Yes No	Is the Sampled Area within a Wetland? Yes No ✓								
Wetland Hydrology Present? Yes No✓	within a Wetland? Yes No								
Remarks: Cowardin Code: UPLAND HGM:	Water Type:								
CONGRAIN COGO. OF EARD	Tracor Typo.								
HYDROLOGY									
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)								
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)								
Surface Water (A1) True Aquatic Plant									
High Water Table (A2) Hydrogen Sulfide (
	neres on Living Roots (C3) Moss Trim Lines (B16) ced Iron (C4) Dry-Season Water Table (C2)								
	ction in Tilled Soils (C6) Crayfish Burrows (C8)								
Drift Deposits (B3) Thin Muck Surface									
Algal Mat or Crust (B4) Other (Explain in F									
Iron Deposits (B5)	Geomorphic Position (D2)								
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)								
Water-Stained Leaves (B9)	Microtopographic Relief (D4)								
Aquatic Fauna (B13)	FAC-Neutral Test (D5)								
Field Observations:									
Surface Water Present? Yes No Depth (inches):									
Water Table Present? Yes No✓ Depth (inches):									
Saturation Present? Yes No / Depth (inches):	Wetland Hydrology Present? Yes No_ ✓								
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, page 1.5)	l previous inspections), if available:								
Remarks:									

VEGETATION (Four Strata) – Use scientific names of plants.

001	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				Tatal Name to a Company
3				Total Number of Dominant Species Across All Strata:5 (B)
4				(2)
5				Percent of Dominant Species That Are OBL_FACW_or FAC: 0% (A/B)
				That Are OBL, FACW, or FAC: (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
500/ affadal access 0		= Total Cov	_	OBL species x 1 =
50% of total cover: 0	20% of	total cover		FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15')	10	,	E4011	
1. Robinia psuedoacacia	10		F <u>ACU</u>	FAC species x 3 =
2. Rhus typhina	5		UPL	FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				
				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7			· ——	1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
9		-		3 - Prevalence Index is ≤3.0 ¹
		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 7.5	20% of	total cover	:3	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 5')				• • • • • • • • • • • • • • • • • • • •
1. Dipsacus fullonum	25		FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2 Reynoutria japonica	5		FACU	
3 Solidago canadensis	20	$\overline{}$	FACU	¹ Indicators of hydric soil and wetland hydrology must
				be present, unless disturbed or problematic.
				Definitions of Four Vegetation Strata:
5				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6				more in diameter at breast height (DBH), regardless of
7				height.
8				Sapling/Shrub – Woody plants, excluding vines, less
9	-			than 3 in. DBH and greater than or equal to 3.28 ft (1
10.				m) tall.
11			· ———	Hards All books are considered as a considered
	50	= Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 25		total cover		or size, and woody plants loss than 6.20 it tall.
Woody Vine Stratum (Plot size: 15')	20 /0 01	total oover		Woody vine – All woody vines greater than 3.28 ft in
1 Lonicera japonica	5	./	FACU	height.
·· <u>·</u>			IACO_	
2				
3				
4				Hydrophytic
5				Vegetation
	5	= Total Cov	er er	Present? Yes No
50% of total cover: <u>2.5</u>	20% of	total cover	1	
Remarks: (Include photo numbers here or on a separate s				
Tremarks. (molade priote numbers here of on a separate s	11001.)			

W-WJKM03,

Sampling Point: WJKM04-UPL` SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Texture Color (moist) Color (moist) % Type¹ (inches) SL 0-18 10YR 3/4 100 Coarse fragments ²Location: PL=Pore Lining, M=Matrix. ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. **Hydric Soil Indicators:** Indicators for Problematic Hydric Soils³: ___ Histosol (A1) ___ 2 cm Muck (A10) (MLRA 147) Dark Surface (S7) ___ Histic Epipedon (A2) Polyvalue Below Surface (S8) (MLRA 147, 148) Coast Prairie Redox (A16) ___ Black Histic (A3) ___ Thin Dark Surface (S9) (MLRA 147, 148) (MLRA 147, 148) ___ Hydrogen Sulfide (A4) ___ Loamy Gleyed Matrix (F2) Piedmont Floodplain Soils (F19) ___ Stratified Layers (A5) ___ Depleted Matrix (F3) (MLRA 136, 147) __ 2 cm Muck (A10) (LRR N) __ Redox Dark Surface (F6) Very Shallow Dark Surface (TF12) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) _ Other (Explain in Remarks) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) (LRR N, _ Iron-Manganese Masses (F12) (LRR N, MLRA 147, 148) MLRA 136) Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) ³Indicators of hydrophytic vegetation and ___ Sandy Redox (S5) ___ Piedmont Floodplain Soils (F19) (MLRA 148) wetland hydrology must be present, Stripped Matrix (S6) Red Parent Material (F21) (MLRA 127, 147) unless disturbed or problematic. Restrictive Layer (if observed): Type: **Hydric Soil Present?** Depth (inches): _ Yes Remarks:

Project/Site: Long Ridge Energy Terminal	Project City/0	County: Monroe		Sampling Date: 11/08/19	
Applicant/Owner: Long Ridge Energy Term				Sampling Point: W-WJKM04 (a & b)	
Investigator(s): KMM, WJ	Secti			5	
Landform (hillslope, terrace, etc.): Toe of Slop				Slope (%): 0-3%	
Subregion (LRR or MLRA): LRRN				Datum: NAD 83	
Soil Map Unit Name: Chagrin silt loam, 0 to 3 p					
Are climatic / hydrologic conditions on the site typ	· ·				
Are Vegetation, Soil, or Hydrology			Circumstances" p	resent? Yes No	
Are Vegetation, Soil, or Hydrology	/ naturally problem	atic? (If needed, e	explain any answei	rs in Remarks.)	
SUMMARY OF FINDINGS - Attach si	te map showing sar	npling point location	ons, transects	, important features, etc.	
Hydrophytic Vegetation Present? Yes	✓ No				
	✓ No	Is the Sampled Area			
	√ No_	within a Wetland?	Yes <u> </u>	No	
Remarks: Cowardin Code: PEM		ynal Water Type:	DDMAAN		
				d C	
Wetland is comprised of two w		o), which are separa	ted by disturbe	d area. Some areas with	
ponded water containing hydrophytes I	acked nydric solls.				
HYDROLOGY					
Wetland Hydrology Indicators:			Secondary Indica	tors (minimum of two required)	
Primary Indicators (minimum of one is required;	check all that apply)		Surface Soil	Cracks (B6)	
✓ Surface Water (A1)	True Aquatic Plants	(B14)	Sparsely Vegetated Concave Surface (B8)		
✓ High Water Table (A2)	Hydrogen Sulfide Oc	lor (C1)	Drainage Pat	terns (B10)	
✓ Saturation (A3)	✓ Oxidized Rhizospher	res on Living Roots (C3)	Moss Trim Li	nes (B16)	
Water Marks (B1)	Presence of Reduce	d Iron (C4)	Dry-Season Water Table (C2)		
Sediment Deposits (B2)	Recent Iron Reduction	on in Tilled Soils (C6)	Crayfish Burrows (C8)		
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in Re	marks)	Stunted or Stressed Plants (D1)		
Iron Deposits (B5)			✓ Geomorphic	Position (D2)	
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	v Aquitard (D3)	
Water-Stained Leaves (B9)				phic Relief (D4)	
Aquatic Fauna (B13)			✓ FAC-Neutral	Test (D5)	
Field Observations:	C	10.			
Surface Water Present? Yes _ ✓ No _	Depth (inches): 6				
	Depth (inches):	0			
	Depth (inches):	0 Wetland H	lydrology Presen	t? Yes <u>√</u> No	
(includes capillary fringe) Describe Recorded Data (stream gauge, monito	oring well, aerial photos, pre	evious inspections), if ava	ilable:		
		, ,,			
Remarks:					

Sampling F	Point: W-W	√JKM04 ((a (&	b)
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Troe Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:
Tiee Stratum (Flot size)	% Cover	Species?	<u>Status</u>	Number of Dominant Species
1				That Are OBL, FACW, or FAC:3 (A)
2				Total Number of Dominant
3				Species Across All Strata:3 (B)
4				Dancout of Dancin out Conscion
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
6				matric 652,1716W, 611716.
7				Prevalence Index worksheet:
	0	= Total Cov	 er	Total % Cover of: Multiply by:
50% of total cover: 0				OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')		•		FACW species x 2 =
1				FAC species x 3 =
				FACU species x 4 =
2				UPL species x 5 =
3		-		Column Totals: (A) (B)
4				(1)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				✓ 1 - Rapid Test for Hydrophytic Vegetation
8				✓ 2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
	0	= Total Cov	er	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover:0	20% o	f total cover:	0	
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1. Phalaris arundinaceae	40	√	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Typha latifolia	15	√	OBL	
3. Scirpus cyperinus	15	<i>─</i> ✓	FACW	¹ Indicators of hydric soil and wetland hydrology must
4. Bidens frondosa	10	-	FACW	be present, unless disturbed or problematic.
5. Setaria faberi	10	-	UPL	Definitions of Four Vegetation Strata:
6. Securigera varia	10		UPL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Lysimachia nummularia	5		FACW	more in diameter at breast height (DBH), regardless of
			1 ACVV	height.
8		-		Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	105	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: <u>52.</u>	5 20% o	f total cover:	21	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size: 15')				height.
1				
2				
3				
4.				
5.				Hydrophytic Vegetation
<u> </u>	0	= Total Cov		Present? Yes \(\sqrt{\sq}\sqrt{\sq}}}}}}}}}\signt{\sqrt{\sq}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}
50% of total cover: 0		f total cover:	_	
		i total cover.		
Remarks: (Include photo numbers here or on a separate s	meet.)			

Profile Desc	cription: (Describe to	o the dept	h needed to docun	nent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	10YR 4/2	95_	7.5YR 4/6	5_	<u>C</u>	M/PL	SIL	
4-18	10YR 4/1	90	7.5YR 4/6	10	С	M/PL	SICL	
	oncentration, D=Deple	etion, RM=	Reduced Matrix, MS	=Masked	Sand Gr	ains.		L=Pore Lining, M=Matrix.
Hydric Soil								ators for Problematic Hydric Soils ³ :
Histosol			Dark Surface					cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be		. , .		148) C	Coast Prairie Redox (A16)
Black Hi			Thin Dark Su			147, 148)	_	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		F2)		P	Piedmont Floodplain Soils (F19)
	d Layers (A5)		✓ Depleted Mat		(0)			(MLRA 136, 147)
	ick (A10) (LRR N)	(111)	Redox Dark S	•	,			Yery Shallow Dark Surface (TF12)
	d Below Dark Surface ark Surface (A12)	(A11)	Depleted Dar Redox Depre					Other (Explain in Remarks)
	firk Surface (A12) fucky Mineral (S1) (L l	DD N	Iron-Mangane			I DD N		
	147, 148)	NN IN,	MLRA 136		55 (F 12) (LKK N,		
	Gleyed Matrix (S4)		Umbric Surfa	•	MI RA 13	s6 122)	3Ind	licators of hydrophytic vegetation and
	Redox (S5)		Piedmont Flo					etland hydrology must be present,
	Matrix (S6)		Red Parent M					less disturbed or problematic.
	Layer (if observed):			iatoriai (i	_ · / (_ .·	, , , <u>, , , , , , , , , , , , , , , , </u>	, un	rece dictarged of pregionidate.
Type:								
Depth (in	ahaa):						Hydria Sail	Present? Yes ✓ No
							Hydric 30ii	Fresent: Tes NO
Remarks:	f theettend thet		بريانه منام بما		ائيد امنماس	محد ماد ما	manle Alan	mortions of the error that contain
			-					portions of the area that contain
hydrology	and hydrophytes	lacked h	iydric soils; likely	/ due to	historio	disturba	nce.	

Wetland ID W-WJKM04 (a & b) Cowardin Code PEM Date 11/08/19



Photograph Number 13
Photograph Direction SW

Comments: W-WJKM04b



Photograph Number 14

Photograph Direction NE
Comments: W-WJKM04b



Photograph Number ___15

Photograph Direction South

Comments: W-WJKM04b



Photograph Number ___16

Photograph Direction SE

Comments: W-WJKM04b

Wetland ID W-WJKM04 (a & b) Cowardin Code PEM Date 11/08/19



Photograph Number 17
Photograph Direction SSE

Comments: W-WJKM04a



Photograph Number 18
Photograph Direction SSW

Comments: W-WJKM04a



Photograph Number <u>19</u>

Photograph Direction WSW

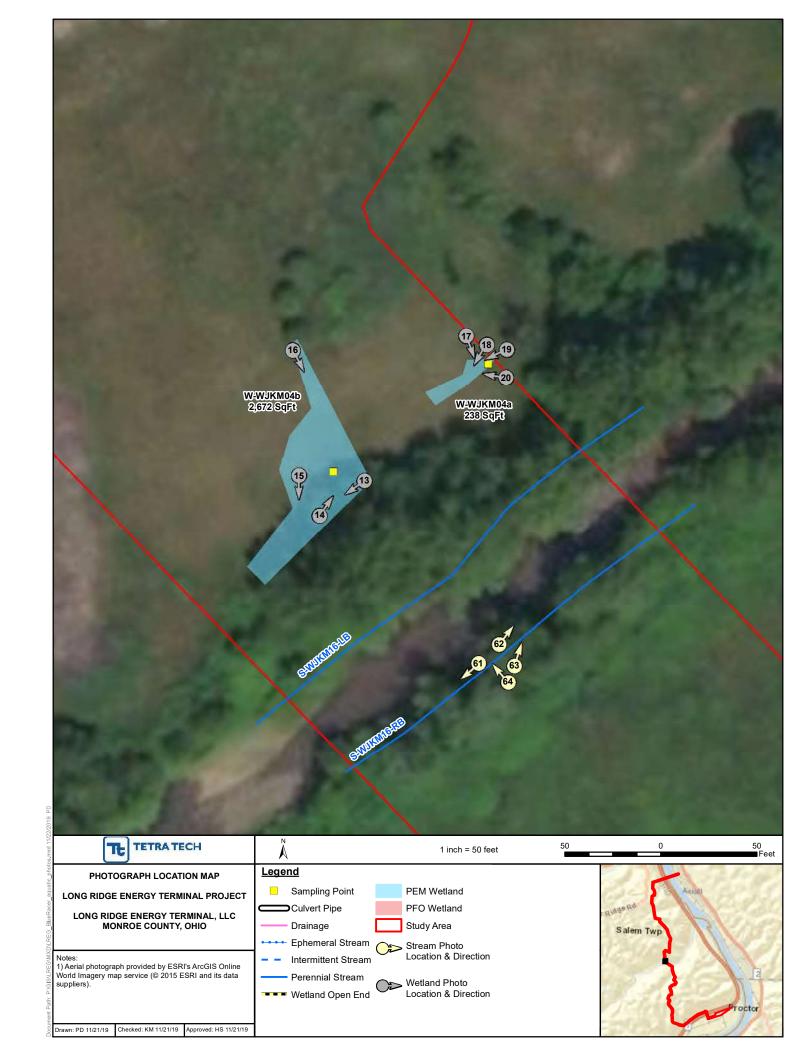
Comments: W-WJKM04a



Photograph Number 20

Photograph Direction West

Comments: W-WJKM04a



Project/Site: Long Ridge Energy Pipelin	e City/	County: Monroe		Sampling Date: 11/08/19
Applicant/Owner: Long Ridge Energy Te		•		Sampling Point: W-WJKM05-PEM
-	Sect	tion. Township. Range: N/		_ ,
Landform (hillslope, terrace, etc.): Floodplai				Slope (%): 0-3%
Subregion (LRR or MLRA): LRRN				Datum: NAD 83
Soil Map Unit Name: Chagrin silt loam, 0 to				
Are climatic / hydrologic conditions on the site t				<u></u>
, <u>, , , , , , , , , , , , , , , , , , </u>	•		•	· •
Are Vegetation, Soil, or Hydrold				present? Yes No
Are Vegetation, Soil, or Hydrold	ogy naturally problen	natic? (If needed, e	explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Attach	site map showing sa	mpling point location	ons, transects	, important features, etc.
Hydrophytic Vegetation Present? Yes	√ No			
	No	Is the Sampled Area	y /	No
1 ·	√ No_	within a Wetland?	res <u> </u>	NO
Cowardin Code: PEM	HGM: Depressi	onal Water Type:		
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is require	d; check all that apply)		Surface Soil	Cracks (B6)
✓ Surface Water (A1)	True Aquatic Plants	(B14)	Sparsely Ve	getated Concave Surface (B8)
√ High Water Table (A2)	Hydrogen Sulfide O		Drainage Pa	tterns (B10)
✓ Saturation (A3)		= : :	Moss Trim Li	
Water Marks (B1)	Presence of Reduce	, ,	-	Water Table (C2)
Sediment Deposits (B2)		on in Tilled Soils (C6)	Crayfish Bur	
Drift Deposits (B3) Algal Mat or Crust (B4)	Thin Muck Surface (Other (Explain in Re			isible on Aerial Imagery (C9) tressed Plants (D1)
Iron Deposits (B5)	Other (Explain in Ne	anarks)		Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	` '
Water-Stained Leaves (B9)				aphic Relief (D4)
Aquatic Fauna (B13)			✓ FAC-Neutral	Test (D5)
Field Observations:				
	5 op (ooo)	3-6		
	o Depth (inches):	0		
	o Depth (inches):	0 Wetland H	lydrology Preser	nt? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, mon	itoring well, aerial photos, pr	evious inspections), if ava	ilable:	
		. ,		
Remarks:				
Wetland complex located in depressi	on, primarily within a ilr	near swaie.		

Troe Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size:)	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:4 (A)
2				Total Niverban of Dansin and
3				Total Number of Dominant Species Across All Strata: 4 (B)
4				Specifical formation (B)
		-		Percent of Dominant Species
5		-		That Are OBL, FACW, or FAC:100% (A/B)
6				Prevalence Index worksheet:
7				
		= Total Cov		Total % Cover of: Multiply by:
50% of total cover: 0	20% of	total cover:	0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1. Fraxinus pennsylvanica	5	✓	FACW	FAC species x 3 =
· · · · · · · · · · · · · · · · · · ·				FACU species x 4 =
2		-		UPL species x 5 =
3		-		
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				
7				Hydrophytic Vegetation Indicators:
				✓ 1 - Rapid Test for Hydrophytic Vegetation
8		-		✓ 2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
		= Total Cov		4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: <u>2.5</u>	20% of	total cover:	1	
Herb Stratum (Plot size: 5'				data in Remarks or on a separate sheet)
1. Scirpus cyperinus	40	✓	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Typha angustifolia	15	<u> </u>	OBL	
3. Carex frankii	15		OBL	¹ Indicators of hydric soil and wetland hydrology must
				be present, unless disturbed or problematic.
4. Agrostis gigantea	10		FACW_	Definitions of Four Vegetation Strata:
5. Euthamia graminifolia	10		F <u>AC</u>	
6. Securigera varia	10		UPL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				more in diameter at breast height (DBH), regardless of height.
8				
•				Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50		total cover:		
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than 3.28 ft in
				height.
2				
3				
4				Hydrophytic
5				Vegetation
	0	= Total Cov	er	Present? Yes <u>√</u> No
50% of total cover: 0		total cover:	_	
Remarks: (Include photo numbers here or on a separate s				
Tremains. (include prioto numbers here of on a separate s	ileet.)			

Profile Desc	cription: (Describe t	to the dept	h needed to docur	nent the i	ndicator	or confirn	n the absence	of indicators.)
Depth	Matrix		Redo	x Features	s		_	
(inches)	Color (moist)	<u>%</u>	Color (moist)	<u> </u>	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-20	10YR 4/2	40	7.5YR 4/6	5	<u>C</u>	_ <u>M</u>	GRSIC	Unconsolidated
	10YR 5/6	30	10YR 4/1	10_	D	<u>M</u>		
	5YR 5/4	15						
						-		
¹ Type: C=C	oncentration, D=Depl	etion, RM=	Reduced Matrix, M	S=Masked	Sand Gr	ains.		=Pore Lining, M=Matrix.
Hydric Soil	Indicators:						Indica	tors for Problematic Hydric Soils ³ :
Histosol			Dark Surface					cm Muck (A10) (MLRA 147)
1	pipedon (A2)		Polyvalue Be					past Prairie Redox (A16)
	istic (A3)		Thin Dark Su			147, 148)		(MLRA 147, 148)
	en Sulfide (A4) d Layers (A5)		Loamy Gleye		F2)			edmont Floodplain Soils (F19)
l ——	uck (A10) (LRR N)		Depleted Ma Redox Dark		:6)			(MLRA 136, 147) ery Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Dark	,	•			ther (Explain in Remarks)
	ark Surface (A12)	(,	Redox Depre		. ,			(=-4
	Mucky Mineral (S1) (L	.RR N,	Iron-Mangan			LRR N,		
	A 147, 148)		MLRA 13					
-	Gleyed Matrix (S4)		Umbric Surfa					cators of hydrophytic vegetation and
-	Redox (S5)		Piedmont Flo					tland hydrology must be present,
	d Matrix (S6)		Red Parent N	Material (F	21) (MLF	A 127, 14	7) unle	ess disturbed or problematic.
	Layer (if observed):							
Type:								,
Depth (in	ches):						Hydric Soil	Present? Yes <u>√</u> No
Remarks:								
						-		pipeline ROW disturbances.
Connecte	d to a large syste	m that ha	ıs similar soils, (clear hy	drology	and cle	ar dominance	e of hydrophytes.

Wetland ID W-WJKM05-PEM Cowardin Code PEM Date 11/08/19



Photograph Number 21
Photograph Direction NNW

Comments:



Photograph Number 22
Photograph Direction South

Comments:



Photograph Number 23
Photograph Direction SW

Comments:



Photograph Number 24
Photograph Direction North



Project/Site: Long Ridge Energy Pipeli	ne	_ City/County: Monroe		Sampling Date: 11/08/19	
Applicant/Owner: Long Ridge Energy T				Sampling Point: W-WJKM05-PFO	
		Section, Township, Range: N			
Landform (hillslope, terrace, etc.): Floodpla				Slope (%): 0-3%	
Subregion (LRR or MLRA): LRRN					
Soil Map Unit Name: Woolper silt loam, 2 to		Long			
Are climatic / hydrologic conditions on the site		-			
Are Vegetation, Soil, or Hydro					
Are Vegetation, Soil, or Hydro			explain any answe	,	
SUMMARY OF FINDINGS – Attack	n site map showii	ng sampling point location	ons, transects	, important features, etc.	
Hydrophytic Vegetation Present? Ye	es <u> </u>				
	es Vo	Is the Sampled Areawithin a Wetland?	Vos √	No	
_	es <u> </u>	within a wettand:	163		
HYDROLOGY					
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)	
Primary Indicators (minimum of one is requi	red; check all that appl	y)	Surface Soil	Cracks (B6)	
✓ Surface Water (A1)	True Aquatio	Plants (B14)	Sparsely Vegetated Concave Surface (B8)		
✓ High Water Table (A2)	Hydrogen Sι	ılfide Odor (C1)	Drainage Patterns (B10)		
✓ Saturation (A3)	Oxidized Rhi	zospheres on Living Roots (C3)	Moss Trim L	ines (B16)	
Water Marks (B1)	·	Reduced Iron (C4)	Dry-Season Water Table (C2)		
Sediment Deposits (B2)		Reduction in Tilled Soils (C6)	Crayfish Bur		
Drift Deposits (B3)	Thin Muck S		Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Expla	in in Remarks)		tressed Plants (D1)	
Iron Deposits (B5)	7\		✓ Geomorphic	` '	
Inundation Visible on Aerial Imagery (B)Water-Stained Leaves (B9)	()		Shallow Aqu	aphic Relief (D4)	
Aquatic Fauna (B13)			✓ FAC-Neutral		
Field Observations:				1 3 3 1 (2 3)	
,	No Depth (inch	_{es):} 6-15			
	No Depth (inch				
	No Depth (inch		Hvdrology Preser	nt? Yes <u>√</u> No	
(includes capillary fringe)	. ,	,			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial ph	otos, previous inspections), ir ava	aliable:		
Remarks:					
Wetland complex located in depress	sion, primarily with	in a linear swale.			

Sampling Point: W-WJKM05-PFC

Trop Stratum /Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:
Tiee Stratum (Flot Size.		Species?		Number of Dominant Species
1. Salix nigra	20		OBL	That Are OBL, FACW, or FAC:8 (A)
2. Platanus occidentalis	15		F <u>ACW</u>	Total Niveshau of Dansin and
3				Total Number of Dominant Species Across All Strata: (B)
Δ				Specifical formation (B)
T		-		Percent of Dominant Species
5				That Are OBL, FACW, or FAC:100% (A/B)
6				Prevalence Index worksheet:
7				
	35	= Total Cov	/er	Total % Cover of: Multiply by:
50% of total cover: <u>17.5</u>	20% of	total cover	<u>. 7</u>	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1. Salix nigra	5	✓	OBL	FAC species x 3 =
2. Platanus occidentalis	5		FACW	FACU species x 4 =
			I ACVV	UPL species x 5 =
3				
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				
8				√ 1 - Rapid Test for Hydrophytic Vegetation
				✓ 2 - Dominance Test is >50%
9	10			3 - Prevalence Index is ≤3.0 ¹
500/ CL LL 5		= Total Cov		4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 5	20% of	total cover	:2	data in Remarks or on a separate sheet)
Helb Stratum (Flot Size)				Problematic Hydrophytic Vegetation (Explain)
1. Scirpus cyperinus	10		FACW	Problematic Hydrophytic Vegetation (Explain)
2. Typha angustifolia	10	\checkmark	OBL	
3. Alisima subcordatum	10	<u>√</u>	OBL	¹Indicators of hydric soil and wetland hydrology must
4 Lemna minor	10	<u> </u>	OBL	be present, unless disturbed or problematic.
5. Eupatorium perfoliatum	5		FACW	Definitions of Four Vegetation Strata:
· · · · · · · · · · · · · · · · · · ·		-	FACVV	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6				more in diameter at breast height (DBH), regardless of
7				height.
8				Continu/Church Mandy plants avaluding vines less
9				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
				,
11				Herb – All herbaceous (non-woody) plants, regardless
700/ 51.11		= Total Cov		of size, and woody plants less than 3.28 ft tall.
50% of total cover: <u>22.</u>	20% of	total cover	:9	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size: 15')				height.
1				
2				
3				
,				
4				Hydrophytic
5				Vegetation
5	0	= Total Cov	_	Present? Yes No
5	0	= Total Cover	_	
5	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	
	0 : 20% of		_	

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the i	ndicator	or confirn	n the absence	of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-20	10YR 4/2	40	7.5YR 4/6	5_	<u>C</u>	<u>M</u>	GRSIC	Unconsolidated
	10YR 5/6	30	10YR 4/1	10_	<u>D</u>	<u>M</u>		
	5YR 5/4	15_				·		
						·		
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	=Masked	Sand Gr	ains.		L=Pore Lining, M=Matrix.
Hydric Soil I	Indicators:						Indica	ators for Problematic Hydric Soils ³ :
Histosol			Dark Surface					cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be				148) C	coast Prairie Redox (A16)
Black Hi			Thin Dark Su	. ,	•	147, 148)		(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		F2)		P	iedmont Floodplain Soils (F19)
	l Layers (A5)		Depleted Mat					(MLRA 136, 147)
	ick (A10) (LRR N)		Redox Dark S	•	,			ery Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Dar				<u>√</u> 0	other (Explain in Remarks)
	ark Surface (A12)		Redox Depre					
	lucky Mineral (S1) (L	RR N,	Iron-Mangane	ese Masse	es (F12) (LRR N,		
	A 147, 148)		MLRA 136	6)				
Sandy G	Gleyed Matrix (S4)		Umbric Surfa	ce (F13) (MLRA 13	6, 122)	³ Ind	icators of hydrophytic vegetation and
Sandy R	tedox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	18) we	tland hydrology must be present,
Stripped	Matrix (S6)		Red Parent M	faterial (F	21) (MLR	A 127, 147	7) unl	less disturbed or problematic.
Restrictive I	_ayer (if observed):							
Type:			<u></u>					
Depth (inc	ches):		,				Hydric Soil	Present? Yes No
Remarks:								
								c pipeline ROW disturbances.
Connected	d to a large syster	m that ha	ıs similar soils, d	lear hyd	drology,	and clea	ar dominanc	e of hydrophytes.

Wetland ID W-WJKM05-PFO Cowardin Code PFO Date 11/08/19



Photograph Number <u>25</u>
Photograph Direction <u>South</u>

Comments:



Photograph Number 26
Photograph Direction SE

Comments:



Photograph Number 27
Photograph Direction West

Comments:



Photograph Number 28
Photograph Direction NNE





Project/Site: Long Ridge Energy Pip	eline	City/County: Monroe		Sampling Date: 11/08/19
Applicant/Owner: Long Ridge Energy				Sampling Point: W-WJKM05-UPL
Investigator(s): KMM, WJ		Section, Township, Range		
Landform (hillslope, terrace, etc.): Flood		Local relief (concave, convex,		Slope (%): 0-3
Subregion (LRR or MLRA): LRRN	Lat: 39 7246	556	-80.864430	0.6p6 (/6)
Soil Map Unit Name: Woolper silt loam,			NWI classific	
Are climatic / hydrologic conditions on the	* *			
Are Vegetation, Soil, or Hy				
Are Vegetation, Soil, or Hy	/drology natural	ly problematic? (If neede	ed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Atta	ach site map shov	ving sampling point loca	ations, transects	s, important features, etc.
Hydrophytic Vegetation Present?	Yes No_ v	/		
Hydric Soil Present?	Yes No_ v	/ Is the Sampled Are		No✓
Wetland Hydrology Present?	Yes No	within a Wetland?	Yes	No -
Remarks: Cowardin Code: UPL		—– Water Typ		
Cowardin Code. OF L	AND HOW.	water Typ	JC.	
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is re	equired: check all that ar	(vlac	Surface Soil	
Surface Water (A1)		itic Plants (B14)		getated Concave Surface (B8)
High Water Table (A2)		Sulfide Odor (C1)		atterns (B10)
Saturation (A3)		Rhizospheres on Living Roots (C	-	
Water Marks (B1)		of Reduced Iron (C4)		Water Table (C2)
Sediment Deposits (B2)	· 	n Reduction in Tilled Soils (C6)		
Drift Deposits (B3)	Thin Muck	Surface (C7)	Saturation V	risible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Exp	olain in Remarks)	Stunted or S	Stressed Plants (D1)
Iron Deposits (B5)			Geomorphic	Position (D2)
Inundation Visible on Aerial Imagery	(B7)		Shallow Aqu	iitard (D3)
Water-Stained Leaves (B9)				aphic Relief (D4)
Aquatic Fauna (B13)			FAC-Neutra	I Test (D5)
Field Observations:	/			
Surface Water Present? Yes	No Depth (in	ches):		
	No Depth (in			
Saturation Present? Yes (includes capillary fringe)	No Depth (in	ches): Wetlar	nd Hydrology Prese	nt? Yes No✓
Describe Recorded Data (stream gauge,	monitoring well, aerial	photos, previous inspections), if	available:	
Remarks:				

Sampling	Point:	W-WJ	JKM0	5-UPL
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')		Species?	Status	Number of Dominant Species
1,				That Are OBL, FACW, or FAC:0 (A)
2				T
3				Total Number of Dominant Species Across All Strata: 4 (B)
Λ				Openies Across All Ottata.
5.				Percent of Dominant Species
				That Are OBL, FACW, or FAC: (A/B)
6				Prevalence Index worksheet:
7		-		Total % Cover of: Multiply by:
0		= Total Cov	_	
50% of total cover: 0	20% of	total cover	:0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15'				FACW species x 2 =
1. Rubus allegheniensis	10		F <u>ACU</u>	FAC species x 3 =
2. Rosa multiflora	5		F <u>ACU</u>	FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5		-		Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
		= Total Cov	/er	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 7.5	20% of	total cover	:3	
Herb Stratum (Plot size: 5'				data in Remarks or on a separate sheet)
1 Dipsacus fullonum	10		FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2 Solidago canadensis	50		FACU	
3. Asclepias syriaca	5		UPL	¹ Indicators of hydric soil and wetland hydrology must
4. Phleum pratense	25		FACU	be present, unless disturbed or problematic.
	10			Definitions of Four Vegetation Strata:
5. Dactylis glomerata			FACU_	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6				more in diameter at breast height (DBH), regardless of
7				height.
8				Sanling/Shrub Woody plants, evaluding vines loss
9				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
10.				m) tall.
11				
	100	= Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50		total cover		or size, and woody plants less than 5.20 it tall.
Woody Vine Stratum (Plot size: 15')	20 /0 01	total cover		Woody vine – All woody vines greater than 3.28 ft in
				height.
1				
2				
3				
4		-		Hydrophytic
5				Vegetation
	0	= Total Cov	/er	Present? Yes No
50% of total cover:0	20% of	total cover	:0	
Remarks: (Include photo numbers here or on a separate s	heet.)			1
	,			

Depth	ription: (Describe t Matrix	•		x Features			absent	- o. maioall	,	
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type ¹	Loc ²	Texture		Remarks	
0-20	10YR 4/3	80	10YR 5/4	20_	С	M	GRSIC	_	Unconsoli	idated
						- ——				
								_		
Type: C=Co	oncentration, D=Depl	etion RM=R	educed Matrix MS	S=Masked 9	Sand Gr	aine	² l ocation: l	- ———— Pl =Pore I ini	ng, M=Matrix	,
Hydric Soil I		cuon, ravi–ra	leduced Matrix, Mc	D-Maskeu (Janu Gi	airis.				lydric Soils ³ :
Histosol			Dark Surface	(\$7)					A10) (MLRA	_
	oipedon (A2)		Polyvalue Be		e (S8) (I	/ILRA 147.			Redox (A16	
Black Hi			Thin Dark Su					(MLRA 14	•	,
	n Sulfide (A4)		Loamy Gleye			, -,			oodplain Soils	s (F19)
	Layers (A5)		Depleted Mat		,			(MLRA 13		,
2 cm Mu	ck (A10) (LRR N)		Redox Dark S	Surface (F6	i)			Very Shallow	/ Dark Surfac	ce (TF12)
	l Below Dark Surface	(A11)	Depleted Dar					Other (Expla	in in Remark	s)
	rk Surface (A12)		Redox Depre							
	lucky Mineral (S1) (L	RR N,	Iron-Mangan		s (F12) (LRR N,				
	147, 148)		MLRA 13	•			3.			
	leyed Matrix (S4)		Umbric Surfa							egetation and
-	edox (S5)		Piedmont Flo						logy must be	
	Matrix (S6) ayer (if observed):		Red Parent N	nateriai (FZ	I) (IVILI	A 127, 14	<i>t</i>) u	niess disturb	ed or probler	nauc.
	Layer (II Observeu).									
Type:							Harabata O.	!! D 40	W	N
Depth (inc	enes):		_				Hyaric So	il Present?	Yes	No
Remarks:										

Wetland ID W-WJKM05-Cowardin Code UPLAND Da	te <u>11/08/19</u>
Photograph Number1	Photograph Number <u>2</u>
Photograph Direction North	Photograph Direction South
Comments:	Comments:
Photograph Number 3	Photograph Number <u>4</u>
Photograph Direction <u>East</u>	Photograph Direction West
Comments:	Comments:

Project/Site: Long Ridge Energy Pipeline	City/C	county: Monroe		Sampling Date: 11/08/19		
Applicant/Owner: Long Ridge Energy Termin	•			Sampling Point: W-WJKM06		
		on, Township, Range: N/		<u> </u>		
Landform (hillslope, terrace, etc.): Shallow swal	e Local rel			Slope (%): 0-3%		
Subregion (LRR or MLRA): LRRN L	at: 39.723532			Datum: NAD 83		
Soil Map Unit Name: Guernsey-Westmore silt loa						
Are climatic / hydrologic conditions on the site typica	al for this time of year? Y	es ✓ No	(If no, explain in R	demarks.)		
Are Vegetation, Soil, or Hydrology _						
Are Vegetation, Soil, or Hydrology _						
SUMMARY OF FINDINGS – Attach site						
	/			, ,		
Hydrophytic Vegetation Present? Yes		Is the Sampled Area	,			
Hydric Soil Present? Wetland Hydrology Present? Yes Yes	/ No / No	within a Wetland?	Yes <u> </u> ✓	No		
Remarks: Cowardin Code: PEM	HGM: Slope	Water Type:	NIDDIANA			
Gowardin Gode. F Livi	том. оюре	water Type.	INTEVVV			
HYDROLOGY						
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)		
Primary Indicators (minimum of one is required; ch	eck all that apply)		Surface Soil	Cracks (B6)		
✓ Surface Water (A1)	Surface Water (A1) True Aquatic Plants (B14)					
High Water Table (A2)	Hydrogen Sulfide Od		Drainage Pa			
Saturation (A3)	Oxidized Rhizospher	es on Living Roots (C3)	Moss Trim L	ines (B16)		
Water Marks (B1)	Presence of Reduced		Dry-Season Water Table (C2)			
Sediment Deposits (B2)	Recent Iron Reductio		Crayfish Bur			
Drift Deposits (B3)	Thin Muck Surface (0		Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Other (Explain in Rer	narks)		tressed Plants (D1)		
Iron Deposits (B5)			✓ Geomorphic Position (D2)			
Inundation Visible on Aerial Imagery (B7)			Shallow Aquitard (D3)			
Water-Stained Leaves (B9) Aquatic Fauna (B13)			Microtopographic Relief (D4) ✓ FAC-Neutral Test (D5)			
Field Observations:			Y FAC-Neutral	Test (D3)		
_	Depth (inches):	3				
	Depth (inches):					
Saturation Present? Yes No	Depth (inches):		ludralagu Brasar	nt? Yes <u>√</u> No		
(includes capillary fringe)				it? Tes No		
Describe Recorded Data (stream gauge, monitoring	g well, aerial photos, pre	vious inspections), if ava	ilable:			
Remarks:						
*Surface was was sheet flowing across w	etland during visit: I	ikely due to heavy ra	ains the day p	rior.		
j ,	9 ,	,	, ,			

/EGETATION (Four Strata) – Use scientific na	ames of	plants.		Sampling Point: W-WJKM06
201		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30')	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:1 (A)
2				Total Number of Dominant
3				Species Across All Strata: 2 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 50 (A/B)
6				
7				Prevalence Index worksheet:
	0	= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:0	20% of	total cover:	0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species45 x 2 =90
1				FAC species x 3 =
2				FACU species 40 x 4 = 160
3				UPL species x 5 =
4				Column Totals: <u>85</u> (A) <u>250</u> (B)
5				Prevalence Index = B/A =2.94
6				
7				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
·	0	= Total Cov	 er	✓ 3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0			_	4 - Morphological Adaptations (Provide supporting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1. Phleum pratense	35	✓	FACU	Problematic Hydrophytic Vegetation¹ (Explain)
2. Agrostis gigantea	25	$\overline{\hspace{1cm}}$	FACW	
3. Juncus effusus			FACW	¹ Indicators of hydric soil and wetland hydrology must
4. Solidago gigantea			FACW	be present, unless disturbed or problematic.
5. Lonicera japonica		-	FACU	Definitions of Four Vegetation Strata:
6.		-		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7		-		more in diameter at breast height (DBH), regardless of height.
8				neight.
9.				Sapling/Shrub – Woody plants, excluding vines, less
				than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
10 11.				
· · · · · · · · · · · · · · · · · · ·	85	= Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: _ 42. 5				of size, and woody plants less than 5.20 it tall.
Woody Vine Stratum (Plot size: 15')	20 /0 01	total covor.		Woody vine – All woody vines greater than 3.28 ft in
1.				height.
•				
4 5.				Hydrophytic
5	0			Vegetation Present? Yes ✓ No
50% of total cover: 0		= Total Cov total cover:		
		total cover.		
Remarks: (Include photo numbers here or on a separate sh	ieet.)			

(Inches)	Matrix Color (moist)	%	Redo Color (moist)	x Features	ype ¹ Loc ²	Texture	Remarks
(inches) 0-2	10YR 4/2	95	7.5YR 4/6		D M/PL	SIL	Remarks
2-18	10YR 4/1	90_	7.5YR 4/6	100	<u> M/PL</u>	SICL	
					_		
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked Sa	and Grains.		L=Pore Lining, M=Matrix.
ydric Soil I							ators for Problematic Hydric Soils ³ :
_ Histosol			Dark Surface		(00) (14) 54 44		2 cm Muck (A10) (MLRA 147)
	nipedon (A2)				(S8) (MLRA 147	, 148) (Coast Prairie Redox (A16)
Black His	n Sulfide (A4)		Loamy Gleye		ILRA 147, 148)		(MLRA 147, 148) Piedmont Floodplain Soils (F19)
	l Layers (A5)		✓ Depleted Ma	, ,		'	(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark			\	/ery Shallow Dark Surface (TF12)
	l Below Dark Surface	e (A11)	Depleted Dar		7)		Other (Explain in Remarks)
_ Thick Da	rk Surface (A12)		Redox Depre	ssions (F8)			
	lucky Mineral (S1) (L	.RR N,			(F12) (LRR N,		
	\ 147, 148)		MLRA 13	•		3	
	leyed Matrix (S4)				.RA 136, 122)		licators of hydrophytic vegetation and
	edox (S5)				(F19) (MLRA 1		etland hydrology must be present,
	Matrix (S6) ayer (if observed):		Red Parent N	nateriai (FZ1)	(MLRA 127, 14	<i>(</i>) un	less disturbed or problematic.
	ayer (ii observed).					1	
Туре:						Hadria Cail	I Duna aut 2 Van 🗸 Na
Type: Depth (inc			<u> </u>			Hydric Soil	Present? Yes <u>√</u> No
Type: Depth (inc			<u> </u>			Hydric Soi	Present? Yes No
Type: Depth (inc			_			Hydric Soil	Present? Yes <u>√</u> No
Type: Depth (inc			_			Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type:						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Туре:						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes <u>√</u> No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes ✓ No
Type: Depth (inc						Hydric Soil	I Present? Yes No
Type: Depth (inc						Hydric Soil	I Present? Yes No

Wetland ID W-WJKM06 Cowardin Code PEM Date 11/08/19



Photograph Number 29
Photograph Direction East

Comments:



Photograph Number 30
Photograph Direction West

Comments:

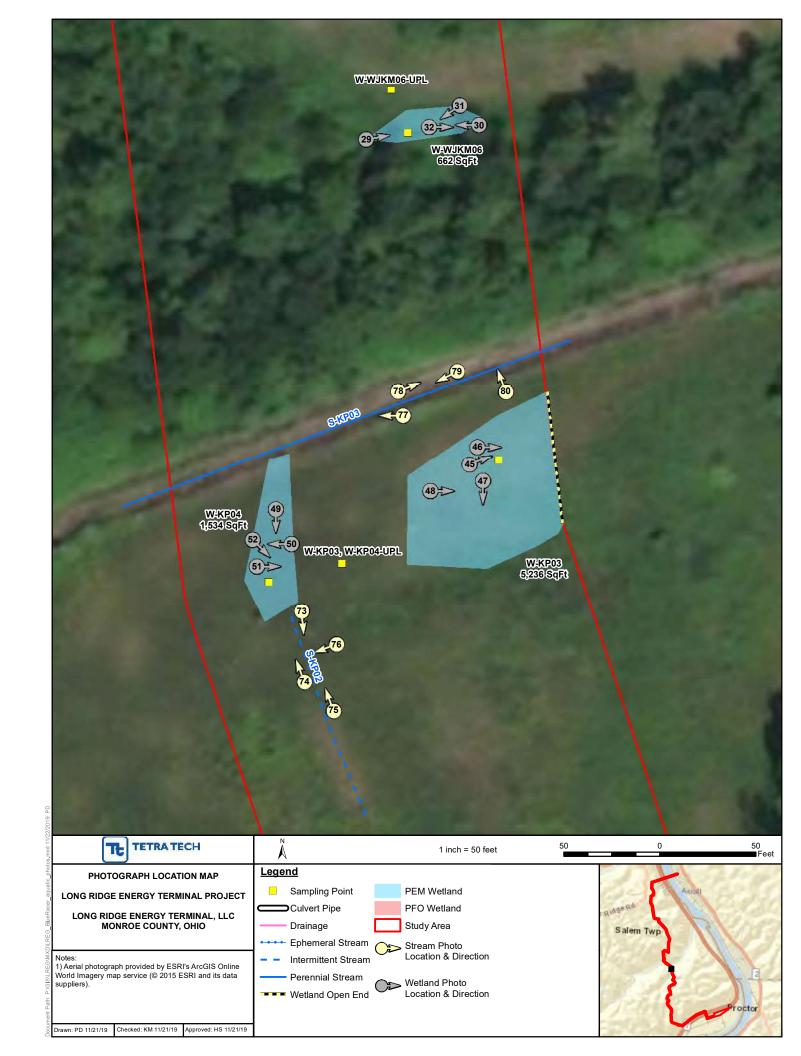


Photograph Number 31
Photograph Direction SW

Comments:



Photograph Number 32
Photograph Direction East



Project/Site: Long Ridge Energy Pipeli	ine	City/County: Monroe)	Sampling Date: 11/08/19
Applicant/Owner: Long Ridge Energy T				Sampling Point: W-WJKM06-UPL
· ·		Section, Township, Ra		
Landform (hillslope, terrace, etc.): Shallow			_	Slope (%): 0-3
Subregion (LRR or MLRA): LRRN		Los	vex, none)	Detum: NAD 83
Soil Map Unit Name: Guernsey-Westmore	silt loams 35 to 70	nercent slones, moderat	iyelv erodedes	Batum. τυ το σσ
•				·
Are climatic / hydrologic conditions on the site		•		
Are Vegetation, Soil, or Hydro	ology significa	ntly disturbed? Are	"Normal Circumstances" ו	present? Yes <u>Y</u> No
Are Vegetation, Soil, or Hydro	ology naturally	problematic? (If no	eeded, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attac	h site map show	ing sampling point l	ocations, transects	s, important features, etc.
Libration Durantation Durantation	na Na 🗸			
	es No √ es No √	Is the Sample		
T	es No ✓	— within a Wetla	nd? Yes	No
D			-	
Remarks: Cowardin Code: UPLAN	ND HGM:	Water	Type:	
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is requi	ired: check all that an	alv)	Surface Soil	
Surface Water (A1)		ic Plants (B14)		getated Concave Surface (B8)
High Water Table (A2)		Sulfide Odor (C1)	Sparsery ve Drainage Pa	= : :
Saturation (A3)		hizospheres on Living Roo		
Water Marks (B1)		f Reduced Iron (C4)		Water Table (C2)
Sediment Deposits (B2)		Reduction in Tilled Soils (
Drift Deposits (B3)		Surface (C7)		isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)		lain in Remarks)		Stressed Plants (D1)
Iron Deposits (B5)			Geomorphic	Position (D2)
Inundation Visible on Aerial Imagery (B	7)		Shallow Aqu	itard (D3)
Water-Stained Leaves (B9)			Microtopogra	aphic Relief (D4)
Aquatic Fauna (B13)			FAC-Neutra	l Test (D5)
Field Observations:				
Surface Water Present? Yes	No <u>✓</u> Depth (inc	hes):		
	No <u>✓</u> Depth (inc			,
	No <u>✓</u> Depth (inc	hes): We	etland Hydrology Presei	nt? Yes No✓
(includes capillary fringe) Describe Recorded Data (stream gauge, me	onitoring well, aerial p	hotos, previous inspections	s), if available:	
, Jan				
Remarks:				

Sampling	Point:	W-WJKN	/106-UPL
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30'	Absolute Dominant Indicato	
Tree Stratum (Plot size: 30')	<u>% Cover Species?</u> Status	Number of Dominant Species
1	·	_ That Are OBL, FACW, or FAC:0 (A)
2		Total Number of Densire and
3		Total Number of Dominant Species Across All Strata: 2 (B)
		(B)
4		Percent of Dominant Species
5		That Are OBL, FACW, or FAC:0% (A/B)
6	·	Prevalence Index worksheet:
7	· — — — —	_
	= Total Cover	
	20% of total cover:0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')		FACW species x 2 =
1		FAC species x 3 =
2		FACU species x 4 =
		UPL species x 5 =
3		
4		_
5	·	Prevalence Index = B/A =
6		Hydrophytic Vegetation Indicators:
7		1 - Rapid Test for Hydrophytic Vegetation
8		
9.		2 - Dominance Test is >50%
<u>. </u>	0 = Total Cover	3 - Prevalence Index is ≤3.0 ¹
50% of total cover:	20% of total cover: 0	4 - Morphological Adaptations ¹ (Provide supporting
E!	20 % of total cover	data in Remarks or on a separate sheet)
Herb Stratum (Plot Size:)	50 ✓ FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
1. Phleum pratense	· — · · · · · · · · · · · · · · · · · ·	-
2. Solidago canadensis		- Indicators of hydric soil and watland hydrology must
3. Asclepias syriaca	5 <u>UPL</u>	 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4		Definitions of Four Vegetation Strata:
5		- Definitions of Four Vegetation Strata.
		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6		more in diameter at breast height (DBH), regardless of
7		_ height.
8		Sapling/Shrub – Woody plants, excluding vines, less
9		than 3 in. DBH and greater than or equal to 3.28 ft (1
10		_ m) tall.
11.		Herb – All herbaceous (non-woody) plants, regardless
	95 = Total Cover	of size, and woody plants less than 3.28 ft tall.
50% of total cover: 47.		
Woody Vine Stratum (Plot size: 15')		Woody vine – All woody vines greater than 3.28 ft in
		height.
1	· —— — —	-
2	· — — — — —	_
3	· ——— ——— ——	_
4	·	- Hydrophytic
5		_ Vegetation
	0 = Total Cover	Present? Yes No _✓
50% of total cover: 0	20% of total cover: 0	
		-
Remarks: (Include photo numbers here or on a separate s	sheet.)	

Profile Desc	ription: (Describe to	o the depth	needed to docun	ent the ir	ndicator	or confirm	the abs	ence of indicat	ors.)	
Depth	Matrix		Redox	Features	,					
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type ¹	Loc ²	Textu		Remark	(S
0-18	10YR 3/4	_100_					SIC	<u> </u>		
	oncentration, D=Deple	etion, RM=R	educed Matrix, MS	=Masked	Sand Gra	ins.		on: PL=Pore Lir		
Hydric Soil I	ndicators:						ļ	Indicators for F	Problematic	Hydric Soils ³ :
Histosol			Dark Surface						(A10) (MLR	•
	ipedon (A2)		Polyvalue Be		. , .		148)		e Redox (A1	6)
Black His			Thin Dark Su			47, 148)		(MLRA 1		
	n Sulfide (A4)		Loamy Gleye		- 2)		-		loodplain So	ils (F19)
	Layers (A5)		Depleted Mat					(MLRA 1		
	ck (A10) (LRR N)	(8.4.4)	Redox Dark S				-		w Dark Surfa	, ,
	Below Dark Surface	(A11)	Depleted Dar				-	Other (Expl	ain in Remar	KS)
	irk Surface (A12) lucky Mineral (S1) (Ll	DD N	Redox Depre Iron-Mangane			DD N				
	147, 148)	nn n,	MLRA 136		5 (F 12) (I	-NN IN,				
	leyed Matrix (S4)		Umbric Surfa		MIRA 13	6 122)		³ Indicators of I	nydronhytic y	egetation and
	edox (S5)		Piedmont Flo				.8)	wetland hydr		-
	Matrix (S6)		Red Parent M					unless distur		
	ayer (if observed):			()	, (
Type:	,									
	ches):		_				Hydrid	c Soil Present?	Yes	No ✓
Remarks:			_				,			_
rtomanto.										

Project/Site: Long Ridge Er	nergy Terminal Pro	oject _{City/C}	_{ounty:} Monroe		Sampling Date: 11/11/2019		
Applicant/Owner: Long Ridg		I, LLC	,		Sampling Point: W-KP01-PEM		
Investigator(s): JM, KP			n, Township, Range: N				
Landform (hillslope, terrace, etc					Slope (%): 3-5		
Subregion (LRR or MLRA): LF					Datum:		
Soil Map Unit Name: Gilpin -			_				
Are climatic / hydrologic condition							
Are Vegetation, Soil	• •	•			present? Yes No		
		-					
Are Vegetation, Soil				explain any answe	•		
SUMMARY OF FINDING	3S – Attach site i	nap snowing sam	pling point location	ons, transects	s, important features, etc.		
Hydrophytic Vegetation Prese	ent? Yes <u>√</u>	No	Is the Sampled Area				
Hydric Soil Present?	Yes <u>√</u>	No	within a Wetland?	Yes ✓	No		
Wetland Hydrology Present?	Yes <u>√</u>	No					
Remarks: Cowardin Co	ode: PEM	HGM: Riverine	Water Type:	RPWWD			
HYDROLOGY				Casandamiladia			
Wetland Hydrology Indicato		alcall that apply			ators (minimum of two required)		
Primary Indicators (minimum o	of one is required; che		244)	Surface Soil			
Surface Water (A1)		_ True Aquatic Plants (I			getated Concave Surface (B8)		
High Water Table (A2)	-	_ Hydrogen Sulfide Odd		✓ Drainage Pa			
✓ Saturation (A3)			es on Living Roots (C3)				
Water Marks (B1) Sediment Deposits (B2)		Presence of Reduced Recent Iron Reduction		Dry-Season Water Table (C2) Crayfish Burrows (C8)			
Drift Deposits (B3)		Thin Muck Surface (C			isible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)		_ Other (Explain in Ren			itressed Plants (D1)		
Iron Deposits (B5)	_	_ Outer (Explain in real	iarno)	✓ Geomorphic			
Inundation Visible on Aer	ial Imagery (B7)			Shallow Aqu			
Water-Stained Leaves (B					aphic Relief (D4)		
Aquatic Fauna (B13)	-,			✓ FAC-Neutral	* *		
Field Observations:							
Surface Water Present?	Yes ✓ No	Depth (inches):	1				
Water Table Present?	Yes ✓ No		0				
Saturation Present?	,		0 Wetland H	Hydrology Presei	nt? Yes ✓ No		
(includes capillary fringe)		, , ,					
Describe Recorded Data (stre	am gauge, monitoring	well, aerial photos, prev	vious inspections), if ava	ailable:			
Remarks:							

Sampling Point: W-KP01-PEN	Sampling	Point:	W-KP0	1-PEN
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Tree Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:		
Tree Stratum (Plot size:) 1 Platanus occidentalis)		Species?		Number of Dominant Species	4	
h	5		FACW_	That Are OBL, FACW, or FAC:	4	(A)
2				Total Number of Dominant		
3				Species Across All Strata:	4	(B)
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	100	(A/B)
6						, ,
7				Prevalence Index worksheet:		
	5 :	= Total Cov	er	Total % Cover of:	Multiply by:	
50% of total cover: <u>2.5</u>	20% of	total cover	1	OBL species x 1	1 =	_
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2	2 =	_
1. Salix nigra	5	✓	OBL	FAC species x 3	3 =	
2				FACU species x 4	1 =	
3				UPL species x 5		
				Column Totals: (A)		
4		-		、		_ ` '
5				Prevalence Index = B/A =		_
6				Hydrophytic Vegetation Indicat	ors:	
7				✓ 1 - Rapid Test for Hydrophyti	c Vegetation	
8				✓ 2 - Dominance Test is >50%		
9				3 - Prevalence Index is ≤3.0 ¹		
0.5		= Total Cov		4 - Morphological Adaptation	s ¹ (Provide sur	porting
50% of total cover: 2.5	20% of	total cover		data in Remarks or on a s		
Herb Stratum (Plot size: 5')		,	E A C\A/	Problematic Hydrophytic Veg	• /	
1. Phalaris arundinacea	40		FACW	1 Toblematic Hydrophytic veg	etation (Expla)
2. Typha angustifolia	30		OBL	1 Indicators of budgie soil and water	and budgeless.	en i et
3. Scirpus cyperinus	20		OBL	¹ Indicators of hydric soil and wetla be present, unless disturbed or p		must
4. Epilobium coloratum	10		FACW	Definitions of Four Vegetation		
5. Cyperus eculentus	5		FACW	Deminions of Four Vegetation	Juana.	
6. Rumex crispus	5		FAC	Tree - Woody plants, excluding v		
7. Dipsacus fullonum	5		FACU	more in diameter at breast height height.	(DBH), regard	less of
8. Polygonum saggitatum			OBL			
9.				Sapling/Shrub – Woody plants, e		*
				than 3 in. DBH and greater than on the minute that the minute that it is the minute that the m	or equal to 3.28	3π(1
10				,		
11	120			Herb – All herbaceous (non-wood		ırdless
50% of total cover: 60		= Total Cov total cover		of size, and woody plants less that	ın 3.28 it tali.	
	20% 01	total cover		Woody vine – All woody vines gr	eater than 3.28	3 ft in
Woody Vine Stratum (Plot size: 15'				height.		
1						
2						
3						
4				Hydrophytic		
5				Vegetation		
_		= Total Cov	_	Present? Yes <u>√</u>	No	
50% of total cover:0	20% of	total cover	. 0			
Remarks: (Include photo numbers here or on a separate s	heet.)					

SOIL Sampling Point: W-KP01-PEM

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the i	ndicator	or confirn	n the ab	osence of indicators.)
Depth	Matrix		Redo	x Features	S			
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²		<u>rture</u> <u>Remarks</u>
0-10	7.5YR 4/2	90_	7.5YR 4/6	10_	<u>C</u>	<u>M</u>	GF	RCL Disturbed rock layer
10-16	7.5YR 5/2	90	7.5YR 4/6	10	С	M	GF	RCL
1Type: C=Co	oncentration, D=Deple	etion RM=	Reduced Matrix MS	——— S=Masked	Sand Gr	aine		tion: PL=Pore Lining, M=Matrix.
Hydric Soil		Suom, rawi–	rteduced Matrix, Mc	-Waskeu	Sand Gr	airis.	Local	Indicators for Problematic Hydric Soils ³ :
Histosol			Dark Surface	(S7)				2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be		ce (S8) (N	II RA 147	148)	Coast Prairie Redox (A16)
Black Hi	. ,		Thin Dark Su				,	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye			, -,		Piedmont Floodplain Soils (F19)
	Layers (A5)		Depleted Mat	rix (F3)	,			(MLRA 136, 147)
2 cm Mu	ck (A10) (LRR N)		Redox Dark S	Surface (F	6)			Very Shallow Dark Surface (TF12)
	Below Dark Surface	(A11)	Depleted Dar					Other (Explain in Remarks)
	ark Surface (A12)		Redox Depre					
	lucky Mineral (S1) (L l	RR N,	Iron-Mangan		es (F12) (LRR N,		
	147, 148)		MLRA 13	•	NU DA 46	0 400)		31
	ileyed Matrix (S4)		Umbric Surfa Piedmont Flo				10\	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,
	edox (S5) Matrix (S6)		Red Parent N					unless disturbed or problematic.
	_ayer (if observed):		Neu i alentin	iateriai (i	21) (WILIX	A 121, 141	',	unless disturbed of problematic.
Type:	Luyer (ii observeu).							
• • •	phon):						Llyde	ric Soil Present? Yes No
	ches):						пуш	TIC Soft Present? Tes NO
Remarks:								

Wetland ID W-KP01-PEM Cowardin Code PEM Date 11/11/2019



Photograph Number 33
Photograph Direction West

Comments:



Photograph Number 34
Photograph Direction NNW

Comments:

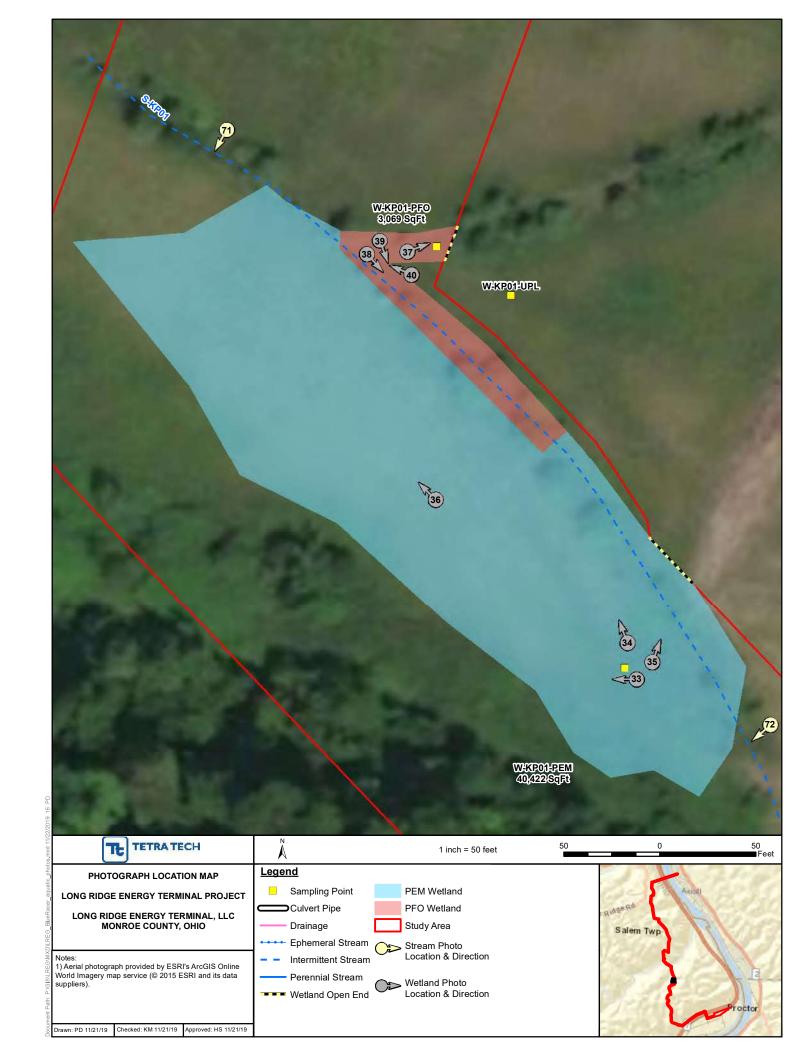


Photograph Number 35
Photograph Direction SSE

Comments:



Photograph Number 36
Photograph Direction WNW



Project/Site: Long Ridge Energy Terminal P	roject City/County: Monroe	Sampling Date: 11/11/2019
Applicant/Owner: Long Ridge Energy Termin		State: OH Sampling Point: W-KP01-PFO
	Section, Township, Range: N	· -
Landform (hillslope, terrace, etc.): Valley		
Subregion (LRR or MLRA): LRRN		0.860698 Datum: NAD 83
Soil Map Unit Name: Gilpin-Upshur silt loams		
· · ·	,	
Are climatic / hydrologic conditions on the site typica	-	
Are Vegetation, Soil, or Hydrology _		ll Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology _	naturally problematic? (If needed, e	explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site	map showing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	/ No lo the Sampled Area	
Hydric Soil Present? Yes	/ Na is the Sampled Area	
Wetland Hydrology Present? Yes	No within a Wetland?	Yes No
Remarks: Cowardin Code: PFO	HGM: Riverine Water Type:	DDWWD
HYDROLOGY		
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; ch	eck all that apply)	Surface Soil Cracks (B6)
✓ Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
✓ High Water Table (A2)	Hydrogen Sulfide Odor (C1)	✓ Drainage Patterns (B10)
✓ Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)		✓ Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)		Microtopographic Relief (D4)
Aquatic Fauna (B13)		✓ FAC-Neutral Test (D5)
Field Observations:	Denth (inches): 0.5	
	Bopai (monos)	
1	Deptil (iliciles)	
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):0 Wetland I	Hydrology Present? Yes <u>√</u> No
Describe Recorded Data (stream gauge, monitoring	g well, aerial photos, previous inspections), if ava	ailable:
Remarks:		
Remarks.		

Tree Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:		
Tiee Stratum (Fiot size.		Species?		Number of Dominant Species		
1. Platanus occidentalis	35	· 	FACW_	That Are OBL, FACW, or FAC:	(A)	
2				Total Number of Deminent		
3				Total Number of Dominant Species Across All Strata: 4	(B)	
4.					(5)	
				Percent of Dominant Species That Are OBL FACW or FAC: 100		
5				That Are OBL, FACW, or FAC:	(A/B)	
6				Prevalence Index worksheet:		
7				Total % Cover of: Multiply I	21/2	
		= Total Cov				
50% of total cover:17.	20% of	total cover	:7	OBL species x 1 =		
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =		
1. Platanus occidentalis	5	✓	FACW	FAC species x 3 =		
2				FACU species x 4 =		
				UPL species x 5 =		
3				Column Totals: (A)		
4				Column rotals (A)	(B)	
5				Prevalence Index = B/A =		
6				Hydrophytic Vegetation Indicators:		
7				✓ 1 - Rapid Test for Hydrophytic Vegetati		
8				1 · · · · · · · · · · · · · · · · · · ·	on	
9.				✓ 2 - Dominance Test is >50%		
·	_	= Total Cov		3 - Prevalence Index is ≤3.0 ¹		
50% of total cover: <u>2.5</u>				4 - Morphological Adaptations (Provide	e supporting	
E	20 /0 01	total cover	·	data in Remarks or on a separate sl	neet)	
Herb Stratum (Flot Size)	ΕO	,	FACW	Problematic Hydrophytic Vegetation ¹ (E	Explain)	
1. Phalaris arundinacea	50				. ,	
2. Typha angustifolia	25		OBL	¹ Indicators of hydric soil and wetland hydrol	ogy must	
3. Scirpus cyperinus	5		OBL	be present, unless disturbed or problematic		
4. Epilobium coloratum	10		FACW	Definitions of Four Vegetation Strata:	-	
_{5.} Dipsacus fullonum	5		FACU	Definitions of Four Vegetation Otrata.		
Polygonum sagittatum	5		OBL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) more in diameter at breast height (DBH), regardless		
<u> </u>						
7				height.		
8				Sapling/Shrub – Woody plants, excluding	vines, less	
9				than 3 in. DBH and greater than or equal to	3.28 ft (1	
10				m) tall.		
11				Herb – All herbaceous (non-woody) plants,	regardless	
	100	= Total Cov	ver	of size, and woody plants less than 3.28 ft t		
50% of total cover:50	20% of	total cover	: <u>20</u>		0.00 %	
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than height.	3.28 π in	
1				neight.		
2						
3						
4				Hydrophytic		
5				Vegetation		
	0	= Total Cov	ver	Present? Yes <u>√</u> No		
50% of total cover:0	20% of	total cover	:0			
Remarks: (Include photo numbers here or on a separate s	heet.)					

Sampling Point: <u>W-KP01-P</u>F0

Profile Desc	ription: (Describe to	the depth	needed to docur	nent the i	ndicator	or confirm	n the abse	ence of indicators.)
Depth	Matrix			x Features				
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²	<u>Textur</u>	
0-14	7.5YR 4/2	90	7.5YR 4/6	10	С	М	GRC	L Disturbed rock layer
					-			
¹ Type: C=Co	oncentration, D=Deple	etion, RM=R	educed Matrix, MS	S=Masked	Sand Gr	ains.		n: PL=Pore Lining, M=Matrix.
Hydric Soil	ndicators:						- In	ndicators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	e (S7)			_	2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be		ce (S8) (N	/ILRA 147,	, 148)	Coast Prairie Redox (A16)
Black Hi	stic (A3)		Thin Dark Su	ırface (S9)	(MLRA	147, 148)		(MLRA 147, 148)
Hydroge	n Sulfide (A4)		Loamy Gleye	ed Matrix (F2)		_	Piedmont Floodplain Soils (F19)
Stratified	l Layers (A5)		✓ Depleted Ma	trix (F3)				(MLRA 136, 147)
2 cm Mu	ck (A10) (LRR N)		Redox Dark	Surface (F	6)		_	Very Shallow Dark Surface (TF12)
	d Below Dark Surface	(A11)	Depleted Da				_	Other (Explain in Remarks)
	ark Surface (A12)		Redox Depre					
	lucky Mineral (S1) (L l	RR N,	Iron-Mangan		es (F12) (LRR N,		
	A 147, 148)		MLRA 13	•				2
	leyed Matrix (S4)		Umbric Surfa					³ Indicators of hydrophytic vegetation and
-	edox (S5)		Piedmont Flo					wetland hydrology must be present,
	Matrix (S6)		Red Parent N	Material (F	21) (MLR	RA 127, 147	7)	unless disturbed or problematic.
	ayer (if observed):							
,	ourse fragments		<u> </u>					_
Depth (inc	ches): <u>14+</u>						Hydric	Soil Present? Yes <u>√</u> No
Remarks:								

SOIL

Wetland ID W-KP01-PF0 Cowardin Code PFO Date 11/11/2019



Photograph Number 37
Photograph Direction ENE

Comments:



Photograph Number 38
Photograph Direction SE

Comments:

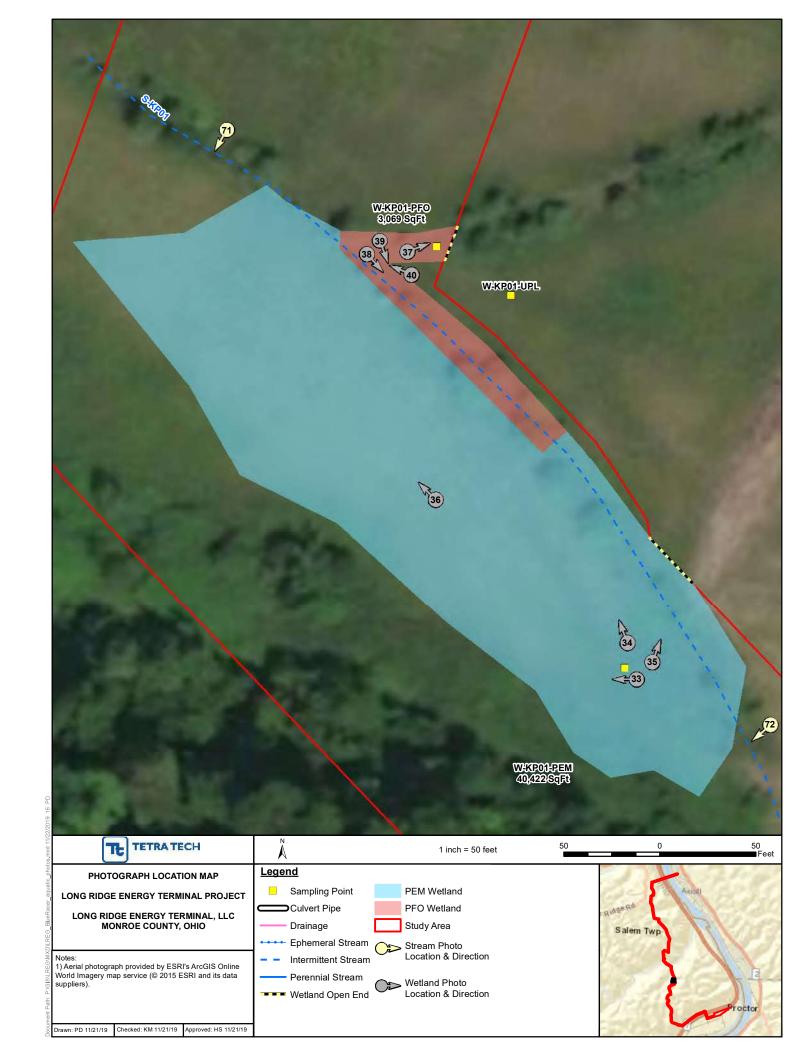


Photograph Number 39
Photograph Direction SSE

Comments:



Photograph Number 40
Photograph Direction WNW



Project/Site: Long Ridge Energy Te	rminal Project	City/Cour	_{nty:} Monroe		Sampling Date: 11/11/2019
	t/Owner: Long Ridge Energy Terminal, LLC				Sampling Point: W-KP01-UP
Investigator(s): JM, KP			Township, Range: N/		
Landform (hillslope, terrace, etc.): Valle					Slope (%) <u>:</u> 3-5
Subregion (LRR or MLRA): LRRN	ubregion (LRR or MLRA): LRRN Lat: 39.719401 Long: -8				NAD 83
Soil Map Unit Name: Gilpin -Upshur s			_		
Are climatic / hydrologic conditions on the	site typical for this t	ime of year? Yes	✓ No	 (If no, explain in R	emarks.)
Are Vegetation, Soil, or Hy		-			oresent? Yes No
Are Vegetation, Soil, or Hy				explain any answe	
SUMMARY OF FINDINGS – Att					
	-			<u> </u>	, <u>, , , , , , , , , , , , , , , , , , </u>
Hydrophytic Vegetation Present?	Yes No_ Yes No_	IS	the Sampled Area		
Hydric Soil Present? Wetland Hydrology Present?	Yes No	/	ithin a Wetland?	Yes	No <u> </u>
Remarks: Cowardin Code: UPL			Water Type:		
HYDROLOGY					
Wetland Hydrology Indicators:				Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is re	equired; check all tha	ıt apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	True A	quatic Plants (B14	1)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)		gen Sulfide Odor (Drainage Pa	tterns (B10)
Saturation (A3)	Oxidiz	ed Rhizospheres o	on Living Roots (C3)	Moss Trim L	ines (B16)
Water Marks (B1)	Preser	nce of Reduced Iro	on (C4)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Recen	t Iron Reduction in	Tilled Soils (C6)	Crayfish Bur	rows (C8)
Drift Deposits (B3)	Thin M	luck Surface (C7)		Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other	(Explain in Remarl	ks)		tressed Plants (D1)
Iron Deposits (B5)				✓ Geomorphic	, ,
Inundation Visible on Aerial Imagery	į (B7)			Shallow Aqu	
Water-Stained Leaves (B9)					aphic Relief (D4)
Aquatic Fauna (B13)				FAC-Neutral	Test (D5)
Field Observations: Surface Water Present? Yes	No <u>✓</u> Depth	· (inches).			
	No <u> </u>				
	No <u> </u>			Judualami Duaaa	12 Van Na 🗸
(includes capillary fringe)					nt? Yes No✓
Describe Recorded Data (stream gauge	, monitoring well, ae	rial photos, previou	us inspections), if ava	ailable:	
Remarks:					
Nomano.					

Sampling Po	nt: W-KP01-UPI
-------------	----------------

30'	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30') 1)	% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC:0 (A)
2				
3				Total Number of Dominant Species Across All Strata: 4 (B)
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
6				That Are ODE, I AGW, OF I AG.
7				Prevalence Index worksheet:
	0	= Total Cov	ver	Total % Cover of: Multiply by:
50% of total cover:0			_	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1. Robinia pseudoacacia	5		FACU	FAC species x 3 =
2. Rosa multiflora	5	✓	FACU	FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
<u> </u>	10	= Total Cov	ver	3 - Prevalence Index is ≤3.0 ¹
50% of total cover:5		total cover		4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1. Dipsacus fullonum	30	✓	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Solidago canadensis	30	$\overline{\hspace{1em}}$	FACU	
3. Vicia sativa	5		FACU	¹Indicators of hydric soil and wetland hydrology must
4 Asclepias syriaca	5		FACU	be present, unless disturbed or problematic.
5. Rosa multiflora	10		FACU	Definitions of Four Vegetation Strata:
6. Euthamia graminifolia	5	-	FAC	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Symphyotrichum ericoides	15		FACU	more in diameter at breast height (DBH), regardless of height.
8				
9.				Sapling/Shrub – Woody plants, excluding vines, less
10.		-		than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
11.		-		,
··· <u> </u>	100	= Total Cov	- ——	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50	20% of	total cover	: 20	
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than 3.28 ft in height.
1				neight.
2				
3.				
4				
5.				Hydrophytic Vegetation
	0	= Total Cov	ver	Present? Yes No _✓
50% of total cover:0		total cover		
Remarks: (Include photo numbers here or on a separate s	heet.)			

Sampling Point: W-KP01-UPL

Depth	Matrix		Redox Fe		. 2					
(inches)	Color (moist)	<u>%</u>	Color (moist)	% Type ¹	Loc ²	<u>Texture</u>		Remark		
0-10	7.5YR 4/3	50_				GRCL	_	Disturbe	d soils	
	10YR 5/4	40_					_			
	2.5Y 5/4	10_					_	Sand de	posit	
							_			
							_			
							_			
							_			
vne: C=Co	ncentration D=Denl	etion RM=	Reduced Matrix, MS=Ma	esked Sand Grai	ne	² Location:	– ———— PL=Pore Lini	na M=Matr	iv	
ydric Soil Ir		euon, min-	rteduced Matrix, MO-M	asked Salid Grai	113.		cators for Pi			oils³:
_ Histosol (Dark Surface (S7))			2 cm Muck (•	
	ipedon (A2)		Polyvalue Below		_RA 147,		Coast Prairie			
Black His			Thin Dark Surface			<i>,</i> —	(MLRA 14		,	
_ Hydrogen	n Sulfide (A4)		Loamy Gleyed Ma	atrix (F2)			Piedmont Flo	odplain Soi	ls (F19)	
	Layers (A5)		Depleted Matrix (I				(MLRA 13			
	ck (A10) (LRR N)		Redox Dark Surfa				Very Shallow		. ,)
-	Below Dark Surface	e (A11)	Depleted Dark Su				Other (Expla	in in Remar	ks)	
	rk Surface (A12) ucky Mineral (S1) (L	DD N	Redox Depression Iron-Manganese I		DD N					
-	ucky Minerai (ST) (L .147, 148)	KK N,	MLRA 136)	viasses (F12) (L	KK N,					
	eyed Matrix (S4)		Umbric Surface (F	=13) (MI RA 136	122)	³ lr	ndicators of h	vdrophytic v	egetation	and
_ Sandy Re			Piedmont Floodpl				vetland hydro		-	
-	Matrix (S6)		Red Parent Mater				ınless disturb			,
				, , ,	<u> </u>	<u></u>				
	ayer (if observed):					I				
	ayer (if observed): urse fragments									
Type: Co			<u></u>			Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments		_			Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments		<u></u>			Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric So	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u>√</u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	vil Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	✓
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u> </u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u> </u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u>✓</u>
Type: Co	urse fragments					Hydric Sc	il Present?	Yes	No _	<u>✓</u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u> </u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	<u> </u>
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	
Type: Col	urse fragments					Hydric Sc	il Present?	Yes	No _	

Project/Site: Long Ridge Energy Termina	al Project City/C	county: Monroe		Sampling Date: 11/11/2019		
	pplicant/Owner: Long Ridge Energy Terminal, LLC			Sampling Point: W-KP02		
Investigator(s): JM, KP	Section Section	on, Township, Range: N/	Ά			
Landform (hillslope, terrace, etc.): Hillslope				Slope (%): <u>3-5</u>		
Subregion (LRR or MLRA): LRRN						
Soil Map Unit Name: Gilpin -Upshur silt loams, 35 to 70 percent slopes NWI classification: None						
Are climatic / hydrologic conditions on the site ty	pical for this time of year? Y	′es √ No ((If no, explain in R	emarks.)		
Are Vegetation, Soil, or Hydrolog	gy significantly distur	bed? Are "Normal	Circumstances" p	present? Yes No		
Are Vegetation, Soil, or Hydrolog	gy naturally problema		explain any answe			
SUMMARY OF FINDINGS - Attach s	site map showing san	npling point locatio	ns, transects	, important features, etc.		
				· · ·		
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes		Is the Sampled Area	,			
Hydric Soil Present? Yes _ Wetland Hydrology Present? Yes _		within a Wetland?	Yes <u>√</u>	No		
Remarks: Cowardin Code: PEM	HGM: Slope	ا Water Type: ۱	10014/14			
HYDROLOGY						
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)		
Primary Indicators (minimum of one is required	l; check all that apply)		Surface Soil			
Surface Water (A1)	True Aquatic Plants (getated Concave Surface (B8)		
High Water Table (A2)	Hydrogen Sulfide Od		Drainage Pa			
Saturation (A3)	✓ Oxidized Rhizospher		Moss Trim Li			
Water Marks (B1)	Presence of Reduced	= : :		Water Table (C2)		
Sediment Deposits (B2)	Recent Iron Reduction	n in Tilled Soils (C6)	Crayfish Bur	rows (C8)		
Drift Deposits (B3)	Thin Muck Surface (0	C7)	Saturation V	isible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in Rer	marks)	Stunted or S	tressed Plants (D1)		
Iron Deposits (B5)			Geomorphic	Position (D2)		
Inundation Visible on Aerial Imagery (B7)			Shallow Aquitard (D3)			
Water-Stained Leaves (B9)		_	aphic Relief (D4)			
Aquatic Fauna (B13)			✓ FAC-Neutral	Test (D5)		
Field Observations:	/					
Surface Water Present? Yes No	Depth (inches):					
	Depth (inches):			,		
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):	Wetland H	Wetland Hydrology Present? Yes <u>√</u> No			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:						
Remarks:						

EGETATION (Four Strata) – Use scientific names of plants.				Sampling Point: W-KP02		
_ 30'	Absolute		Indicator	Dominance Test worksheet:		
<u>Tree Stratum</u> (Plot size: <u>30'</u>)	% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are OBL FACW or FAC: 3		
1				That Are OBL, FACW, or FAC: (A)		
2		-		Total Number of Dominant		
3		-		Species Across All Strata:3 (B)		
4				Percent of Dominant Species		
5		-		That Are OBL, FACW, or FAC: 100 (A/B)		
6		-		Prevalence Index worksheet:		
7				Total % Cover of: Multiply by:		
50% of total cover:0		= Total Co		OBL species x 1 =		
	20% 01	total cover	:	FACW species x 2 =		
Sapling/Shrub Stratum (Plot size: 15')				FAC species x 3 =		
1				FACU species x 4 =		
2				UPL species x 5 =		
3		-		Column Totals: (A) (B)		
4		-		(X)(X)		
5				Prevalence Index = B/A =		
6		-		Hydrophytic Vegetation Indicators:		
7				✓ 1 - Rapid Test for Hydrophytic Vegetation		
8				✓ 2 - Dominance Test is >50%		
9				3 - Prevalence Index is ≤3.0 ¹		
50% of total cover:0		= Total Co		4 - Morphological Adaptations ¹ (Provide supporting		
	20 % 01	lotal cover		data in Remarks or on a separate sheet)		
Herb Stratum (Plot size: 5') 1. Bidens frondosa	20	1	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)		
2. Juncus effusus	20		FACW			
3. Cyperus eculentus	25		FACW	¹ Indicators of hydric soil and wetland hydrology must		
4 Poa trivialis	15		FACW	be present, unless disturbed or problematic.		
5. Phleum pratense	10	-	FACU	Definitions of Four Vegetation Strata:		
6. Dactylis glomerata	10	-	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or		
		-		more in diameter at breast height (DBH), regardless of		
7				height.		
8				Sapling/Shrub – Woody plants, excluding vines, less		
9				than 3 in. DBH and greater than or equal to 3.28 ft (1		
10		-		m) tall.		
11	100			Herb – All herbaceous (non-woody) plants, regardless		
50% of total cover: 50	20% of	= Total Co total cover	ver 20	of size, and woody plants less than 3.28 ft tall.		
Woody Vine Stratum (Plot size: 15')	20 /0 01	total cover		Woody vine – All woody vines greater than 3.28 ft in		
				height.		
1 2						
3 4.						
		-		Hydrophytic		
5				Vegetation Present? Yes ✓ No		
50% of total cover: 0		= Total Co total cover	_			
0070 01 10101 007011		total covel	·			
Remarks: (Include photo numbers here or on a separate s	neet.)					

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lir Hydric Soil Indicators: Indicators for F Histosol (A1)	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19)
GRCL GRCL GRCL GRCL GRCL D GRCL GRC GRC GRC GRC I GRC GRC GRC	ning, M=Matrix. Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. PL=Pore Limit Indicators:	ning, M=Matrix. Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Dark Surface (S7) Polyvalue Below Surface (S8) (MLRA 147, 148) Loamy Gleyed Matrix (F2) Depleted Matrix (F2) Piedmont F (MLRA 1 Piedmont F (ML	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Dark Surface (S7) Polyvalue Below Surface (S8) (MLRA 147, 148) Loamy Gleyed Matrix (F2) Depleted Matrix (F2) Piedmont F (MLRA 1 Piedmont F (ML	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Histosol (A1)	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
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Histosol (A1)	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
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dric Soil Indicators:Indicators for FHistosol (A1)Dark Surface (S7)2 cm MuckHistic Epipedon (A2)Polyvalue Below Surface (S8) (MLRA 147, 148)Coast PrairBlack Histic (A3)Thin Dark Surface (S9) (MLRA 147, 148)(MLRA 1Hydrogen Sulfide (A4)Loamy Gleyed Matrix (F2)Piedmont FStratified Layers (A5)Depleted Matrix (F3)(MLRA 12 cm Muck (A10) (LRR N)Redox Dark Surface (F6)Very ShalloDepleted Below Dark Surface (A11)Depleted Dark Surface (F7)Other (ExplThick Dark Surface (A12)Redox Depressions (F8)Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122)Sandy Gleyed Matrix (S4)Umbric Surface (F13) (MLRA 136, 122)	Problematic Hydric Soils ³ (A10) (MLRA 147) rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
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Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) 2 cm Muck (A10) (LRR N) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Dark Surface (S9) (MLRA 147, 148) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122) January Gleyed Matrix (F2) Piedmont F (MLRA 1 Piedmont F Other (Expl. Matrix (F3) Nukra 136) Umbric Surface (F13) (MLRA 136, 122)	rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Depleted Matrix (F2) Depleted Matrix (F3) Thick Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Polyvalue Below Surface (S8) (MLRA 147, 148) Loamy Gleyed Matrix (F2) Piedmont F (MLRA 1 Coast Prair (MLRA 1 Polyvalue Below Surface (S9) (MLRA 147, 148) Polyvalue Below Surface (S9) (MLRA 147, 148) Piedmont F Other (Expl Redox Dark Surface (F7) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122) Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122)	rie Redox (A16) 147, 148) Floodplain Soils (F19) 136, 147) ow Dark Surface (TF12)
Hydrogen Sulfide (A4) Stratified Layers (A5) 2 cm Muck (A10) (LRR N) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122) "Indicators of Indicators of Indicat	Floodplain Soils (F19) 1 36, 147) ow Dark Surface (TF12)
Stratified Layers (A5)✓Depleted Matrix (F3)(MLRA 12 cm Muck (A10) (LRR N)Redox Dark Surface (F6)Very ShalloDepleted Below Dark Surface (A11)Depleted Dark Surface (F7)Other (ExplThick Dark Surface (A12)Redox Depressions (F8)Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)Iron-Manganese Masses (F12) (LRR N, MLRA 136)Sandy Gleyed Matrix (S4)Umbric Surface (F13) (MLRA 136, 122)	136, 147) bw Dark Surface (TF12)
2 cm Muck (A10) (LRR N) Redox Dark Surface (F6) Very Shallo Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Other (Expl Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) MLRA 136) Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) Sandy Gleyed Matrix (S4) Indicators of Indicators	ow Dark Surface (TF12)
Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Depleted Dark Surface (F7) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 136) Umbric Surface (F13) (MLRA 136, 122) Other (Expl.)	
Thick Dark Surface (A12) Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N, MLRA 136) Umbric Surface (F13) (MLRA 136, 122) Alpha 136, 122)	iain in Remarks)
Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) Sandy Gleyed Matrix (S4) MLRA 136) Umbric Surface (F13) (MLRA 136, 122) Iron-Manganese Masses (F12) (LRR N, MLRA 136) Umbric Surface (F13) (MLRA 136, 122)	
MLRA 147, 148) MLRA 136) Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) 3 Indicators of Indicato	
Sandy Gleyed Matrix (S4) Umbric Surface (F13) (MLRA 136, 122) 3Indicators of	
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 148) wetland hydr	hydrophytic vegetation and
<u> </u>	rology must be present,
	bed or problematic.
estrictive Layer (if observed):	
Type:	,
Depth (inches): Hydric Soil Present?	Yes <u>√</u> No
emarks:	

Wetland ID W-KP02 Cowardin Code PEM Date 11/11/2019



Photograph Number 41
Photograph Direction NW

Comments:



Photograph Number <u>42</u>
Photograph Direction North

Comments:



Photograph Number 43
Photograph Direction SSE

Comments:



Photograph Number 44

Photograph Direction SE



Project/Site: Long Ridge Energy Terminal I	Project City/C	county: Monroe		Sampling Date: 11/11/2019
Applicant/Owner: Long Ridge Energy Termi				Sampling Point: W-KP02-UP
	Section			
Landform (hillslope, terrace, etc.): Valley				Slope (%): 3-5
Subregion (LRR or MLRA): LRRN				
Soil Map Unit Name: Gilpin -Upshur silt loams, 3				
Are climatic / hydrologic conditions on the site typic				
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology				
SUMMARY OF FINDINGS – Attach sit				
	No_ √		· · · · · · · · · · · · · · · · · · ·	· · ·
	No ✓	Is the Sampled Area		/
	No ✓	within a Wetland?	Yes	No
Remarks: Cowardin Code: UPLAND		Water Type:		
		,,,		
HYDROLOGY			O I I I'	
Wetland Hydrology Indicators:	le e ele ell'Ale ek en eleA		<u> </u>	tors (minimum of two required)
Primary Indicators (minimum of one is required; c			Surface Soil	
Surface Water (A1)	True Aquatic Plants (getated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Od		Drainage Pa	
Saturation (A3)	Oxidized RhizospherPresence of Reduced	-	Moss Trim Li	Water Table (C2)
Water Marks (B1) Sediment Deposits (B2)	Recent Iron Reductio	` '	Crayfish Bur	
Drift Deposits (B3)	Thin Muck Surface (0		-	sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Rer			tressed Plants (D1)
Iron Deposits (B5)	Outer (Explain in res	namo)	✓ Geomorphic	* *
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	
Water-Stained Leaves (B9)				aphic Relief (D4)
Aquatic Fauna (B13)			FAC-Neutral	
Field Observations:				
	Depth (inches):			
Water Table Present? Yes No	✓ Depth (inches):			
	✓ Depth (inches):	Wetland H	lydrology Preser	it? Yes No✓
(includes capillary fringe) Describe Recorded Data (stream gauge, monitori	ing well aerial photos pre	vious inspections) if avai	ilable [.]	
December Necerala Data (calcam gauge, memter)	ng won, donar photos, pro	viodo inopositorio,, ir avai	ilabio.	
Remarks:				

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-KP02-UPL

30'		Dominant		Dominance Test worksheet:		
<u>Tree Stratum</u> (Plot size:30') 1	% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
				That Are OBE, I ACW, OF I AC.		(A)
2				Total Number of Dominant	2	(D)
3				Species Across All Strata:		(B)
4				Percent of Dominant Species	0	
5				That Are OBL, FACW, or FAC: _	0	(A/B)
6				Prevalence Index worksheet:		
7				Total % Cover of:	Multiply by	
		Total Cov		OBL species x 1		
50% of total cover: 0	20% of	total cover:	0	FACW species x 2		
Sapling/Shrub Stratum (Plot size: 15')				FAC species x 3		
1						
2				FACU species x 4		
3				UPL species x 5		
4				Column Totals: (A)		(B)
5				Prevalence Index = B/A = _		
6				Hydrophytic Vegetation Indicato		_
7				1 - Rapid Test for Hydrophytic		
8				2 - Dominance Test is >50%	vegetation	
9				3 - Prevalence Index is ≤3.0 ¹		
	0 =	= Total Cov	er	4 - Morphological Adaptations	1 (Dravida aur	porting
50% of total cover:0	20% of	total cover:	0			
Herb Stratum (Plot size: 5')				data in Remarks or on a se		
1. Dipsacus fullonum	5		FACU_	Problematic Hydrophytic Vege	tation (Expla	in)
2. Solidago canadensis	30	✓	FACU_	1		
3. Securigera varia	25	_✓	UPL	¹ Indicators of hydric soil and wetland be present, unless disturbed or pro		must
4. Phleum pratense	5		FACU	Definitions of Four Vegetation S		
5. Dactylis glomerata	10		FACU	Definitions of Four Vegetation 3	ıraıa.	
6. Daucus carota	5		UPL	Tree – Woody plants, excluding vii		
7 Trifolium repens	10		FACU	more in diameter at breast height (height.	DBH), regard	less of
8 Symphyotrichum ericoides			FACU			
g Plantago major			FACU	Sapling/Shrub – Woody plants, ex		
				than 3 in. DBH and greater than or m) tall.	equal to 3.28	sπ(1
10				,		
11	100 =			Herb – All herbaceous (non-woody of size, and woody plants less than	y) plants, rega	rdless
50% of total cover: 50		= Total Cov total cover:		of size, and woody plants less than	1 3.20 It tall.	
Woody Vine Stratum (Plot size:15')	20 /0 01	iolai covei.		Woody vine – All woody vines gre	ater than 3.28	3 ft in
/ Int oizo.				height.		
1						
2						
3						
4				Hydrophytic		
5				Vegetation Present? Yes	No ✓	
50% (111)		Total Cov	_	rieseiit: res	NO	
50% of total cover:0		total cover:	0			
Remarks: (Include photo numbers here or on a separate sh	neet.)					

Sampling Point: W-KP02-UPL

	•	to the depth	needed to document the indicator or co	nfirm the absence	ce of indicators.)
Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist) % Type ¹ Lo	c ² Texture	Remarks
0-6	2.5Y 4/4	100		CL	
6-16	2.5Y 4/4	70		GRCL	Disturbed soils
	2.5Y 5/1	30			Biotarboa cono
	2.51 5/1				
					_
					_
					_
					_
¹Type: C=Co	oncentration, D=Dep	etion, RM=R	educed Matrix, MS=Masked Sand Grains.	² Location:	PL=Pore Lining, M=Matrix.
Hydric Soil		,			icators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface (S7)		2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Below Surface (S8) (MLRA	147, 148)	Coast Prairie Redox (A16)
Black Hi	stic (A3)		Thin Dark Surface (S9) (MLRA 147, 1	48)	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleyed Matrix (F2)		Piedmont Floodplain Soils (F19)
	l Layers (A5)		Depleted Matrix (F3)		(MLRA 136, 147)
	ick (A10) (LRR N)	(8.4.4)	Redox Dark Surface (F6)		Very Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Dark Surface (F7)	_	Other (Explain in Remarks)
	ark Surface (A12) lucky Mineral (S1) (L	DD N	Redox Depressions (F8)Iron-Manganese Masses (F12) (LRR	N	
	147, 148)	.KK N,	MLRA 136)	14,	
	Gleyed Matrix (S4)		Umbric Surface (F13) (MLRA 136, 12	2) ³ lı	ndicators of hydrophytic vegetation and
	ledox (S5)		Piedmont Floodplain Soils (F19) (MLF		wetland hydrology must be present,
-	Matrix (S6)		Red Parent Material (F21) (MLRA 12)		unless disturbed or problematic.
Restrictive I	_ayer (if observed):				·
Type: Co	ourse fragments		<u>_</u>		
Depth (inc	ches): <u>10+</u>		<u>_</u>	Hydric So	oil Present? Yes No _✓
Remarks:					

Project/Site: Long Ridge Energy Terminal Project City/0	County: Monroe Sampling Date: 11/11/2019				
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP03				
Investigator(s): JM, KP Section, Township, Range: N/A					
Landform (hillslope, terrace, etc.): Hillslope Local re					
Subregion (LRR or MLRA): LRRN Lat: 39.723063 Long: -80.861765 Datum: NAD 83					
Soil Map Unit Name: Guernsey-Westmore silt loams, 12 to 18 percent					
Are climatic / hydrologic conditions on the site typical for this time of year?					
Are Vegetation, Soil, or Hydrology significantly distu					
Are Vegetation, Soil, or Hydrology naturally problem					
	npling point locations, transects, important features, etc.				
/					
Hydrophytic Vegetation Present? Yes ✓ No	Is the Sampled Area				
Hydric Soil Present? Wetland Hydrology Present? Yes ✓ No No	within a Wetland? Yes No				
Domonto	Weter Turner BRIANAID				
Cowardin Code: PEM HGM: Slope	Water Type: RPWWD				
HYDROLOGY					
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)				
Surface Water (A1) True Aquatic Plants	(B14) Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2) Hydrogen Sulfide Oc					
	res on Living Roots (C3) Moss Trim Lines (B16)				
Water Marks (B1) Presence of Reduce	• • • • • • • • • • • • • • • • • • • •				
	on in Tilled Soils (C6) Crayfish Burrows (C8)				
Drift Deposits (B3) Thin Muck Surface (
Algal Mat or Crust (B4) Other (Explain in Re	•				
Iron Deposits (B5)	✓ Geomorphic Position (D2)				
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)				
Water-Stained Leaves (B9)	Microtopographic Relief (D4)				
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)				
Field Observations: Surface Water Present? Yes No ✓ Depth (inches):					
Water Table Present? Yes ✓ No Depth (inches):	3				
Saturation Present? Yes <u>Y</u> No Depth (inches):	U Wetland Hydrology Present? Yes ✓ No				
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pro	evious inspections), if available:				
Remarks:					
Tromano.					

'EGETATION (Four Strata) – Use scientific na	imes of	piants.		Sampling Point: W-KP03
30'	Absolute	Dominant		Dominance Test worksheet:
	% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are ORL FACW or FAC: 4 (A)
1				mat Ale OBL, FACW, 01 FAC(A)
3				Total Number of Dominant Species Across All Strata: 4 (B)
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
6				
7				Prevalence Index worksheet:
	0	= Total Cov	 er	Total % Cover of: Multiply by:
50% of total cover:0		total cover:	_	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30')				FACW species x 2 =
1. Salix nigra	5	✓	OBL	FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
8				✓ 1 - Rapid Test for Hydrophytic Vegetation
9.				✓ 2 - Dominance Test is >50%
ə	5	= Total Cov		3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 2.5				4 - Morphological Adaptations (Provide supporting
Herb Stratum (Plot size: 30')	20 70 01	total covor.		data in Remarks or on a separate sheet)
1. Phalaris arundinacea	20	✓	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Typha angustifolia	30	<u> </u>	OBL	
3 Scirpus cyperinus			OBL	¹ Indicators of hydric soil and wetland hydrology must
4. Epilobium coloratum	 5		OBL	be present, unless disturbed or problematic.
5. Cyperus eculentus	 5		FACW	Definitions of Four Vegetation Strata:
6. Poa trivialis	15		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Dactylis glomerata	5		FACU	more in diameter at breast height (DBH), regardless of
8. Juncus effusus	10		FACW	height.
g Solidago gigantea			FACW	Sapling/Shrub – Woody plants, excluding vines, less
*			171011	than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
10				
11	100			Herb – All herbaceous (non-woody) plants, regardless
50% of total cover: 50	20% of	= Total Cov total cover:	er 20	of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 15')	20% 01	total cover.		Woody vine – All woody vines greater than 3.28 ft in
				height.
1				
2				
3				
4				Hydrophytic
5				Vegetation Present? Yes ✓ No
500% -54-4-1 0		= Total Cov	_	riesent: Tesv No
50% of total cover:0		total cover:		
Remarks: (Include photo numbers here or on a separate sh	neet.)			

Sampling Point: W-KP03

Depth	Matrix	0/		x Features		Loc²	Taytura		Damarka	
(inches)	Color (moist)	<u>%</u>	Color (moist)		Type ¹		Texture	-	Remarks	
0-16	2.5Y 4/2	90_	10YR 4/6	10_	<u>C</u>	_ <u>M</u>	GRCL_			
						_				
	ncontration D-Donl	otion DM-	Poduced Matrix MS	———— S=Maakad	Sand C		² Legation: D		ng, M=Matrix.	
ype. C=Co ∕dric Soil Ir	ncentration, D=Depl	elion, Rivi-	Reduced Mairix, Mi	5-Maskeu	Sand G	ains.			roblematic Hy	
			Dark Surface	(07)						
_ Histosol (ipedon (A2)		Dark Surface Polyvalue Be		o (SS) (MI DA 147			A10) (MLRA 1 e Redox (A16)	
_ Histic Epi _ Black His			Thin Dark Su		. , .		1 7 0) 0	MLRA 14)		
_	n Sulfide (A4)		Loamy Gleye			147, 140)	Р		oodplain Soils	(F19)
	Layers (A5)		✓ Depleted Ma		_,		<u> </u>	(MLRA 13		(1.10)
	ck (A10) (LRR N)		Redox Dark	, ,	6)		V		v Dark Surface	e (TF12)
	Below Dark Surface	e (A11)	Depleted Da	•					in in Remarks	
Thick Da	rk Surface (A12)		Redox Depre	essions (F8	3)					
_ Sandy Mi	ucky Mineral (S1) (L	.RR N,	Iron-Mangan	ese Masse	es (F12)	(LRR N,				
MLRA	147, 148)		MLRA 13	6)						
_ Sandy Gl	eyed Matrix (S4)		Umbric Surfa	ice (F13) (MLRA 1	36, 122)	³ Ind	icators of h	ydrophytic veg	getation and
_ Sandy Re	edox (S5)		Piedmont Flo	odplain So	oils (F19) (MLRA 14	8) we	tland hydro	logy must be	present,
	Matrix (S6)		Red Parent N	Material (F	21) (MLF	RA 127, 147	') <u>un</u>	less disturb	ed or problem	atic.
	ayer (if observed):									
	urse fragments									
Depth (inc	hes): 16+						Hydric Soil	Present?	Yes <u>√</u>	_ No
emarks:										

Wetland ID W-KP03 Cowardin Code PEM Date 11/11/2019



Photograph Number <u>45</u>
Photograph Direction ENE

Comments:



Photograph Number <u>46</u>
Photograph Direction East

Comments:

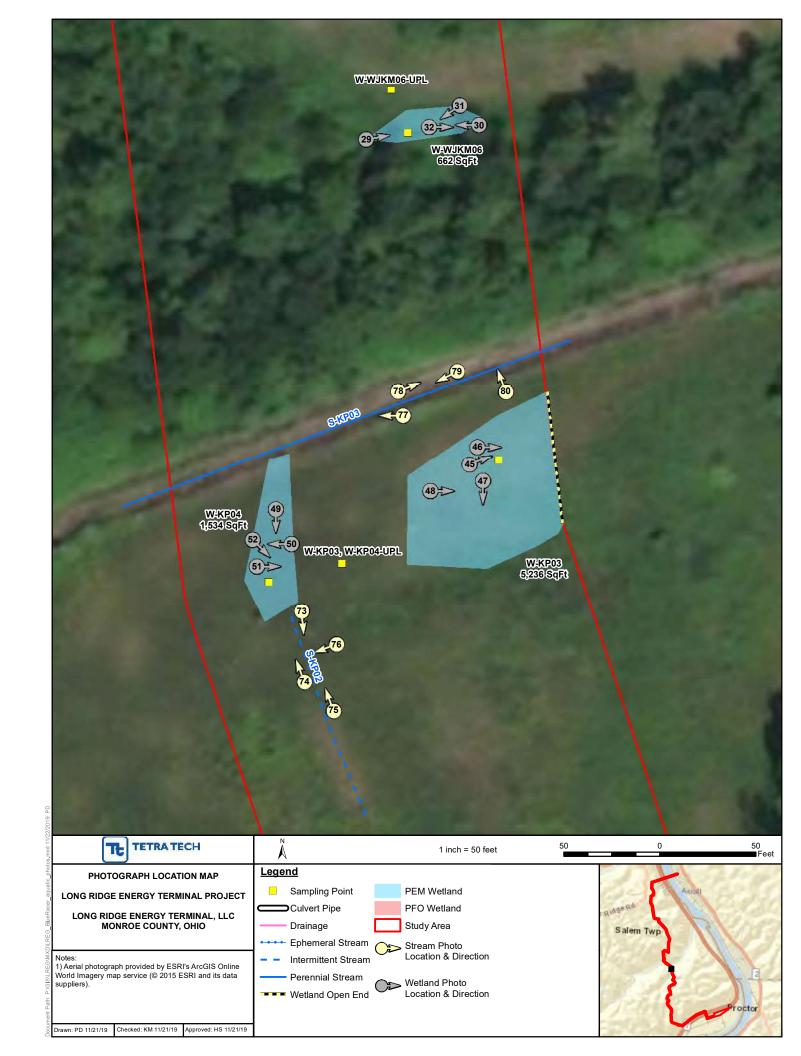


Photograph Number <u>47</u>
Photograph Direction <u>SSE</u>

Comments:



Photograph Number 48
Photograph Direction East



Project/Site: Long Ridge Energy Terminal Pro	ject City/C	_{county:} Monroe		Sampling Date: 11/11/2019
Applicant/Owner: Long Ridge Energy Terminal	, LLC			Sampling Point: W-KP03,W-KP04-UPL
Investigator(s): JM, KP	Section	on, Township, Range: N	/A	
Landform (hillslope, terrace, etc.): Valley	Local rel	ef (concave, convex, no	_{ne):} Linear	Slope (%): 3-5
Subregion (LRR or MLRA): LRRN Lat	. 39.722918	Long: <u>-80</u>	.862058	Datum: NAD 83
Soil Map Unit Name: Guernsey-Westmore silt loam				
Are climatic / hydrologic conditions on the site typical for		_		
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS – Attach site m			explain any answe	
SOMMAN OF THE INC.	rap showing san	ipinig point location	Jiis, transects	, important reatures, etc.
Hydrophytic Vegetation Present? Yes		Is the Sampled Area		
	No	within a Wetland?	Yes	No <u> </u>
Wetland Hydrology Present? Yes	No ✓			
Remarks: Cowardin Code: UPLAND	HGM:	Water Type:		
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	tors (minimum of two required)
Primary Indicators (minimum of one is required; chec	k all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Veg	getated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Od	or (C1)	Drainage Pat	
Saturation (A3)	Oxidized Rhizosphere	es on Living Roots (C3)	Moss Trim Li	nes (B16)
Water Marks (B1)	Presence of Reduced	l Iron (C4)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction	n in Tilled Soils (C6)	Crayfish Buri	rows (C8)
Drift Deposits (B3)	Thin Muck Surface (C			sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Rer	narks)		tressed Plants (D1)
Iron Deposits (B5)			Geomorphic	
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	
Water-Stained Leaves (B9)				phic Relief (D4)
Aquatic Fauna (B13)			FAC-Neutral	Test (D5)
Field Observations: Surface Water Present? Yes No	_ Depth (inches):			
	Depth (inches):			
	_ Depth (inches):		Judralagu Brasan	ıt? Yes No✓_
(includes capillary fringe)	_ Deptil (iliches)	wetiand i	Tydrology Fresen	10 V
Describe Recorded Data (stream gauge, monitoring v	well, aerial photos, pre	vious inspections), if ava	nilable:	
Remarks:				
Nemans.				

	Sampling	Point: W-KP03,W-KP04-UP	L
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0.01	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				T. A. I. N. and C. D. and C. A. C.
3				Total Number of Dominant Species Across All Strata: 5 (B)
4			·	(2)
5				Percent of Dominant Species That Are OBL FACW or FAC: (A/B)
5				That Are OBL, FACW, or FAC: (A/B)
6			· ——	Prevalence Index worksheet:
1	0			Total % Cover of: Multiply by:
50% of total cover: 0		= Total Cov		OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')	20 /6 01	total cover		FACW species x 2 =
				FAC species x 3 =
1				FACU species x 4 =
2				
3				
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
-	0	= Total Cov	/er	3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0		total cover	_	4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1 Dipsacus fullonum	5		FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Solidago canadensis	5		FACW	
3. Vicia sativa	20	√	FACU	¹ Indicators of hydric soil and wetland hydrology must
4 Phleum pratense	15	<u> </u>	FACU	be present, unless disturbed or problematic.
5 Dactylis glomerata	15		FACU	Definitions of Four Vegetation Strata:
6. Daucus carota	15		UPL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Trifolium repens	15		FACU	more in diameter at breast height (DBH), regardless of
8 Symphyotrichum ericoides			FACU	height.
s	<u>5</u> 5			Sapling/Shrub – Woody plants, excluding vines, less
{9.} Plantago major			FACU	than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	/er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: <u>50</u>	20% of	total cover	<u>: 20 </u>	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size:15')				height.
1				_
2				
3				
4.				
5.				Hydrophytic Vegetation
	0	= Total Cov	er	Present? Yes No✓
50% of total cover: 0		total cover	_	
Remarks: (Include photo numbers here or on a separate s				1
	,			

Sampling Point: W-KP03,W-KP04-UPL

Profile Desc	ription: (Describe t	o the depth	needed to docum	ent the ir	ndicator o	r confirm	the absence	of indicator	s.)	
Depth	Matrix		Redox	c Features	<u> </u>					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	· -	Remarks	
0-6	2.5Y 4/4	_100_					CL			
6-16	2.5Y 4/4	70					GRCL		Disturbed	soils
	2.5Y 5/1	30								
	2.51 5/1									
1			No de la colonia	N4 I I	0 1 0		21	N. D I be be	NA NA . 4	
Hydric Soil I	oncentration, D=Depl	etion, RM=F	Reduced Matrix, MS	=Masked	Sand Gra	ıns.		L=Pore Lining ators for Pro		
_			David October	(07)						-
Histosol			Dark Surface		- (CO) /M	I D A 447		2 cm Muck (A	, ,	•
	nipedon (A2)		Polyvalue Be Thin Dark Su				140) (Coast Prairie I MLRA 147)
Black Hi	n Sulfide (A4)		Loamy Gleye	, ,	•	+1, 140)		Piedmont Floo		· (E10)
	l Layers (A5)		Depleted Mat		۷)		'	(MLRA 136		s (1 1 <i>3)</i>
	ck (A10) (LRR N)		Redox Dark S	. ,	3)		\	/ery Shallow		e (TF12)
	Below Dark Surface	(A11)	Depleted Dar					Other (Explain		
	rk Surface (A12)	` ,	Redox Depre					- (1		,
	lucky Mineral (S1) (L	RR N,	Iron-Mangane			RR N,				
	147, 148)		MLRA 136							
Sandy G	leyed Matrix (S4)		Umbric Surfa		MLRA 136	5, 122)	³ Inc	dicators of hyd	drophytic ve	getation and
Sandy R	edox (S5)		Piedmont Flo	odplain Sc	oils (F19) (MLRA 14	8) w	etland hydrolo	ogy must be	present,
Stripped	Matrix (S6)		Red Parent M	laterial (F2	21) (MLR	127, 147	') ur	nless disturbe	d or problen	natic.
Restrictive I	ayer (if observed):									
Type:										
Depth (inc	ches):						Hydric Soi	I Present?	Yes	_ No <u>√</u>
Remarks:										

Project/Site: Long Ridge Energy Terminal Project Cit	ty/County: Monroe Sampling Date: 11/11/2019
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP04
Investigator(s): JM, KP	ection, Township, Range: N/A
	relief (concave, convex, none): Concave Slope (%): 3-5
Subregion (LRR or MLRA): LRRN Lat: 39.722894	Long: -80.862194 Datum: NAD 83
Soil Map Unit Name: Guernsey-Westmore silt loams, 12 to 18 percer	
Are climatic / hydrologic conditions on the site typical for this time of year'	
Are Vegetation, Soil, or Hydrology significantly dis	
Are Vegetation, Soil, or Hydrology naturally proble	
	ampling point locations, transects, important features, etc.
/	
Hydrophytic Vegetation Present? Yes ✓ No ✓ No No No	Is the Sampled Area
Hydric Soil Present? Wetland Hydrology Present? Yes ✓ No No No	within a Wetland? Yes No
Remarks: Cowardin Code: PEM HGM: Slope	Water Type: RPWWD
Cowardin Code. PEM HGM. Slope	Water Type. RPWWD
HYDROLOGY	_
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	· · · · · · · · · · · · · · · · · · ·
1	Surface Soil Cracks (B6) ats (B14) Sparsely Vegetated Concave Surface (B8)
Surface Water (A1) True Aquatic Plan ✓ High Water Table (A2) Hydrogen Sulfide	
1 	heres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Redu	
· · · · —	ction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Surface	
Algal Mat or Crust (B4) Other (Explain in	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No ✓ Depth (inches):_	
Water Table Present? Yes ✓ No Depth (inches):_	3
Saturation Present? Yes ✓ No Depth (inches):_	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos,	prayious inspections) if available:
Describe Necorded Data (stream gauge, monitoring well, acrial photos,	previous inspections), if available.
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Domining Special Speci	es? <u>\$</u>	Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: Prevalence Index worksheet:
= Total	Cover		That Are OBL, FACW, or FAC:3 (A) Total Number of Dominant Species Across All Strata:4 (B) Percent of Dominant Species That Are OBL, FACW, or FAC:75 (A/B)
	Cover		Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: (A) (B)
f total co			Species Across All Strata:4 (B) Percent of Dominant Species That Are OBL, FACW, or FAC:75 (A/B)
f total co			Percent of Dominant Species That Are OBL, FACW, or FAC: (B) (B)
f total co			That Are OBL, FACW, or FAC:
f total co			That Ale OBE, I ACW, OIT AC. (A/B)
f total co			Prevalence Index worksheet:
f total co			
f total co			Total % Cover of: Multiply by:
		0	OBL species x 1 =
			FACW species x 2 =
			FAC species x 3 =
			FACU species x 4 =
			UPL species x 5 =
			Column Totals: (A) (B)
			Prevalence Index = B/A =
_			Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation
			✓ 2 - Dominance Test is >50%
= Total	Cover		3 - Prevalence Index is ≤3.0 ¹
-		0	4 - Morphological Adaptations ¹ (Provide supporting
			data in Remarks or on a separate sheet)
✓	F.	ACW	Problematic Hydrophytic Vegetation ¹ (Explain)
	o	BL	
	F.	ACU	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	F.	ACU	Definitions of Four Vegetation Strata:
	F.	ACW	Definitions of Four Vegetation Strata.
	F.	ACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
	F.	ACW	more in diameter at breast height (DBH), regardless of height.
	F	ACW	
	F.	ACW	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
			m) tall.
			Herb – All herbaceous (non-woody) plants, regardless
= Total	Cover		of size, and woody plants less than 3.28 ft tall.
		22	Woody vine – All woody vines greater than 3.28 ft in
			height.
_			Hydrophytic
			Vegetation
-		^	Present? Yes <u>√</u> No
of total co	over:		
	of total co	_ = Total Cover of total cover:	= Total Cover of total cover: 0 FACW OBL FACU FACW FACW FACW FACW FACW FACW FACW FACW

Sampling Point: W-KP04

SOIL

Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	k Features	3	. 2		
(inches)	Color (moist)	<u>%</u>	Color (moist)	<u>%</u>	Type ¹	Loc ²	<u>Texture</u>	Remarks
<u>0-16</u>	2.5Y 4/2	90	10YR 4/6	10_	<u>C</u>	<u>M</u>	GRCL_	
			-					
						- ——		
	-							
¹ Type: C=Co	oncentration, D=Depl	etion, RM=R	Reduced Matrix, MS	=Masked	Sand Gr	ains.	² Location: P	L=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:						Indica	ators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	(S7)			2	cm Muck (A10) (MLRA 147)
Histic Ep	pipedon (A2)		Polyvalue Bel	low Surfac	ce (S8) (N	/ILRA 147,	148) C	oast Prairie Redox (A16)
Black His			Thin Dark Su			147, 148)		(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		F2)		P	iedmont Floodplain Soils (F19)
	Layers (A5)		Depleted Mat					(MLRA 136, 147)
	ck (A10) (LRR N)	(0.4.4)	Redox Dark S					ery Shallow Dark Surface (TF12)
	d Below Dark Surface	(A11)	Depleted Dar Redox Depre				0	ther (Explain in Remarks)
	ark Surface (A12) lucky Mineral (S1) (L l	RR N	Iron-Mangane			IRRN		
	147, 148)	ixix i v ,	MLRA 136		55 (I IZ) (LIXIX IV,		
	ileyed Matrix (S4)		Umbric Surfa	•	MLRA 13	36. 122)	³ Ind	icators of hydrophytic vegetation and
	edox (S5)		Piedmont Flo					tland hydrology must be present,
-	Matrix (S6)		Red Parent M					less disturbed or problematic.
	ayer (if observed):			•			1	·
Type:			<u></u>					
	ches):		_				Hydric Soil	Present? Yes ✓ No
Remarks:	,						1 -	

Wetland ID W-KP04 Cowardin Code PEM Date 11/11/2019



Photograph Number 49
Photograph Direction South

Comments:



Photograph Number 50
Photograph Direction West

Comments:

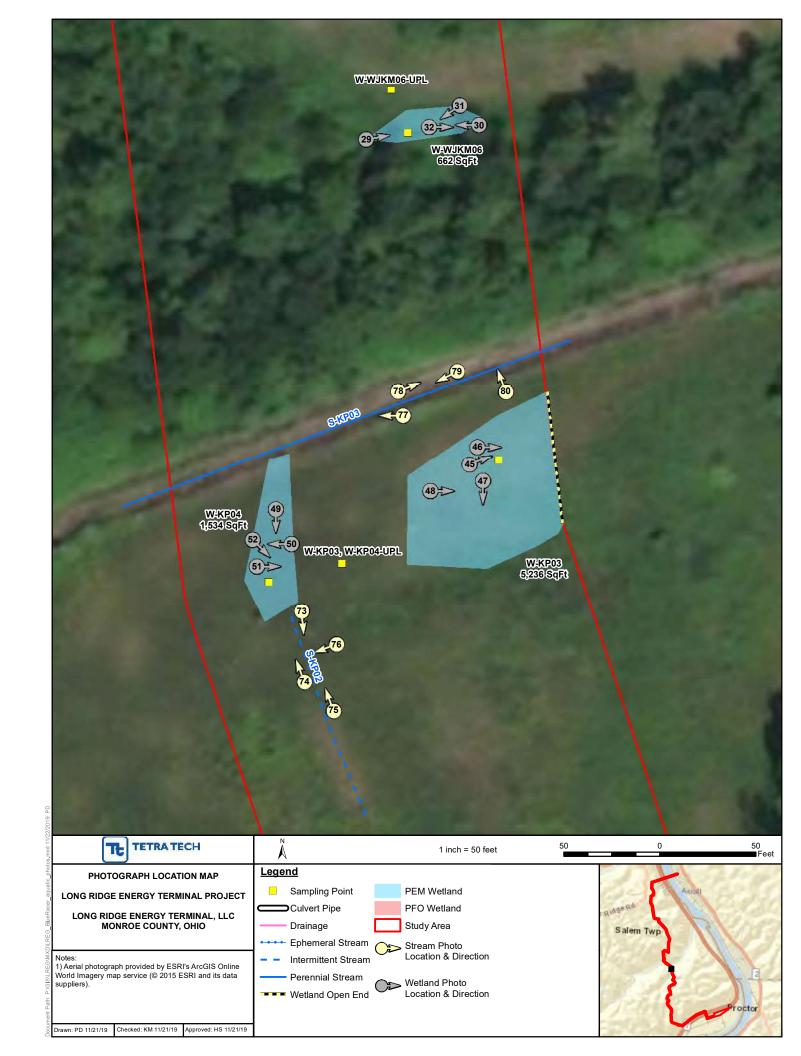


Photograph Number 51
Photograph Direction East

Comments:



Photograph Number 52
Photograph Direction SE



Project/Site: Long Ridge Energy Terminal Project City	//County: Monroe Sampling Date: 11/11/19
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP05
	ction, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local r	
Subregion (LRR or MLRA): LRRN Lat: 39.703875	Long: -80.855947 Datum: NAD 83
Soil Map Unit Name: Vandalia-Sees silt loams, 18 to 35 percen	t slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year?	,
Are Vegetation, Soil, or Hydrology significantly dist	
Are Vegetation, Soil, or Hydrology naturally proble	
SUMMARY OF FINDINGS – Attach site map showing sa	impling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area
Hydric Soil Present? Yes No	within a Wetland? Yes No
Wetland Hydrology Present? Yes <u>✓</u> No	
Remarks: Cowardin Code: PEM HGM: Riverine	Water Type: RPWWD
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) True Aquatic Plants	
✓ High Water Table (A2) — Hydrogen Sulfide C	
1 · · · · · · ·	eres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduc	
Sediment Deposits (B2) Recent Iron Reduc	
Drift Deposits (B3) Thin Muck Surface	
Algal Mat or Crust (B4) Other (Explain in R	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No ✓ Depth (inches):	
Water Table Present? Yes <u>✓</u> No Depth (inches):	4
Saturation Present? Yes No Depth (inches):	0 Wetland Hydrology Present? Yes <u>√</u> No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections) if available:
Describe Necorded Data (stream gauge, monitoring well, aerial photos, p	Tevious inspections), ii avaliable.
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

/EGETATION (Four Strata) – Use scientific n	ames of	plants.		Sampling Point: W-KP05
201	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30'</u>)		Species?	<u>Status</u>	Number of Dominant Species That Are ORL FACW or FAC: 4 (A)
1			·	That Are OBL, FACW, or FAC:4 (A)
2		-		Total Number of Dominant Species Across All Strata: 4 (B)
3		-		Species Across All Strata:4 (B)
4				Percent of Dominant Species That Are ORL FACW or FAC: 100 (A/R)
5				That Are OBL, FACW, or FAC: (A/B)
6			·	Prevalence Index worksheet:
1			<u> </u>	Total % Cover of: Multiply by:
50% of total cover:0		= Total Cov		OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')	20 % 01	lotal cover		FACW species x 2 =
				FAC species x 3 =
1				FACU species x 4 =
2				UPL species x 5 =
3			·	Column Totals: (A) (B)
4				(D)
5				Prevalence Index = B/A =
6		-		Hydrophytic Vegetation Indicators:
7				✓ 1 - Rapid Test for Hydrophytic Vegetation
8				✓ 2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
0		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 0	20% of	total cover	:0	data in Remarks or on a separate sheet)
TIEID Stratum (Flot Size)	00	,	OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
1. Scirpus atrovirens		· - / -		
2. Epilobium coloratum		· - /	FACW	¹ Indicators of hydric soil and wetland hydrology must
3. Bidens frondosa		. 	FACW	be present, unless disturbed or problematic.
4. Cyperus eculentus	15		FACW_	Definitions of Four Vegetation Strata:
5. Carex franki	20		OBL	Tree Meader lands and discounting 2 in (7.0 am) an
6. Phalaris arundinacea	5		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
7. Dipsacus fullonum	5		FACU	height.
8. Solidago species	5		ND	Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	110	= Total Cov	/er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: 55	20% of	total cover	:22	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size: 15')				height.
1				
2			<u> </u>	
3				
4				Hydrophytic
5				Vegetation ,
	0	= Total Cov	/er	Present? Yes <u>√</u> No
50% of total cover:0	20% of	total cover	:0	
Remarks: (Include photo numbers here or on a separate s	heet.)			
ND- Species not determined				

Depth	ription: (Describe to Matrix	to the dept		x Features	cator or confirm	n the absence	of indicat	ors.)	
(inches)	Color (moist)	%	Color (moist)	<u> </u>	ype ¹ Loc ²	<u>Texture</u>		Remarks	
0-6	10YR 4/2	90	7.5YR 4/6	10C	M/PL	CL			
6-16	10YR 5/2	85	7.5YR 4/6	<u>15</u> <u>C</u>	<u> M</u>	GRCL_			
						-			
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked Sa	nd Grains.			ing, M=Matrix.	duia Caila ³ .
Hydric Soil			Dank Confess	(07)				roblematic Hy	
Histosol	(A1) pipedon (A2)		Dark Surface		S8) (MLRA 147			(A10) (MLRA 1 4 e Redox (A16)	47)
Histic Li Black Hi					LRA 147, 148)	, 140) 0	(MLRA 14	, ,	
	n Sulfide (A4)		Loamy Gleye			P		oodplain Soils ((F19)
	l Layers (A5)		✓ Depleted Mat				(MLRA 1		` '
	ick (A10) (LRR N)		Redox Dark S	` '				w Dark Surface	
	Below Dark Surface	e (A11)		k Surface (F7	")	0	ther (Expla	ain in Remarks)	
	ark Surface (A12) lucky Mineral (S1) (L	DD N	Redox Depre		E12) (I DD N				
	147, 148)	.KK N,	MLRA 13		r 12) (LKK N ,				
	Gleyed Matrix (S4)		Umbric Surfa	•	RA 136, 122)	³ Indi	icators of h	ydrophytic veg	etation and
	ledox (S5)				(F19) (MLRA 1 4			ology must be p	
Stripped	Matrix (S6)				(MLRA 127, 14		ess disturb	ped or problema	atic.
Restrictive I	_ayer (if observed):								
Type:								,	
Depth (inc	ches):					Hydric Soil	Present?	Yes <u>√</u>	No
Remarks:									

Wetland ID W-KP05 Cowardin Code PEM Date 11/11/19



Photograph Number <u>53</u>
Photograph Direction NNW

Comments:



Photograph Number 54
Photograph Direction ENE

Comments:



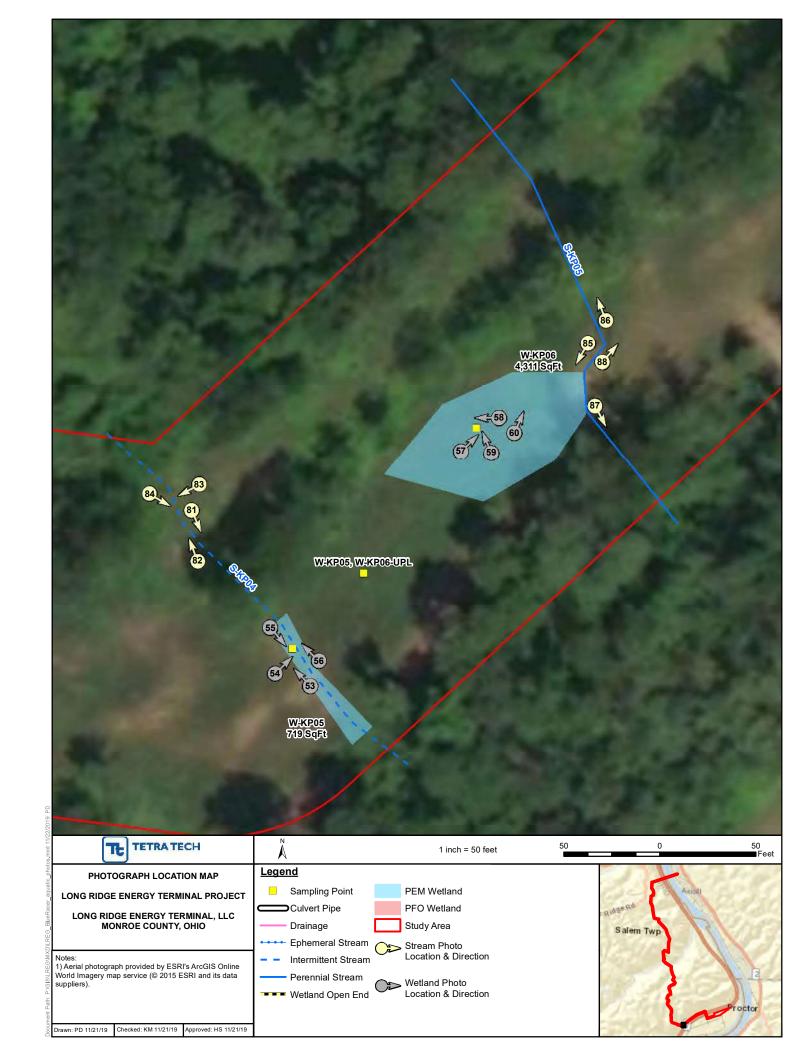
Photograph Number <u>55</u>
Photograph Direction <u>SSE</u>

Comments:



Photograph Number 56

Photograph Direction NNW



Project/Site: Long Ridge Energy To	erminal Project	City/County: Monro	е	Sampling Date: 11/11/19		
Applicant/Owner: Long Ridge Energ				Sampling Point: W-KP05,W-KP06-UP		
Investigator(s): JM, KP		Section, Township, R				
Landform (hillslope, terrace, etc.): Valle				Slope (%): 3-5		
Subregion (LRR or MLRA): LRRN				_{Datum:} NAD 83		
Soil Map Unit Name: Vandalia-Sees			-			
Are climatic / hydrologic conditions on th				<u> </u>		
Are Vegetation, Soil, or h	- · ·	·				
		•	·			
Are Vegetation, Soil, or F			needed, explain any answe			
SUMMARY OF FINDINGS – At	tach site map snov	wing sampling point	locations, transects	, important features, etc.		
Hydrophytic Vegetation Present?	Yes No	/ Is the Sample	ed Area			
Hydric Soil Present?	Yes No	within a Wetla		No <u> </u>		
Wetland Hydrology Present?	Yes No	<u>/</u>				
Remarks: Cowardin Code: UP	LAND HGM:	Water	Туре:			
HYDROLOGY						
Wetland Hydrology Indicators:			Secondary Indica	tors (minimum of two required)		
Primary Indicators (minimum of one is	required; check all that ar	oply)	Surface Soil	Cracks (B6)		
Surface Water (A1)	True Aqua	atic Plants (B14)	Sparsely Veg	getated Concave Surface (B8)		
High Water Table (A2)	Hydrogen	Sulfide Odor (C1)	Drainage Pat			
Saturation (A3)	Oxidized F	Rhizospheres on Living Roo	ots (C3) Moss Trim Li	nes (B16)		
Water Marks (B1)	Presence	of Reduced Iron (C4)	Dry-Season \	Nater Table (C2)		
Sediment Deposits (B2)	Recent Iro	on Reduction in Tilled Soils	(C6) Crayfish Burn	ows (C8)		
Drift Deposits (B3)	Thin Muck	Surface (C7)		sible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Ex	plain in Remarks)		ressed Plants (D1)		
Iron Deposits (B5)			Geomorphic			
Inundation Visible on Aerial Image	ry (B7)		Shallow Aqui			
Water-Stained Leaves (B9)			<u> </u>	Microtopographic Relief (D4) FAC-Neutral Test (D5)		
Aquatic Fauna (B13)			FAC-Neutral	Test (D5)		
Field Observations: Surface Water Present? Yes	No <u>✓</u> Depth (in	ichoc):				
Water Table Present? Yes	No <u>✓</u> Depth (in	ohoo):				
		lational Underland Dresse	t? Yes No✓_			
(includes capillary fringe)	No <u>+</u> Deptil (iii	cries)	reliand Hydrology Fresen	tr res No		
Describe Recorded Data (stream gaug	e, monitoring well, aerial	photos, previous inspection	ns), if available:			
Remarks:						
Remarks.						

0.01	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size:)	% Cover	Species?	Status	Number of Dominant Species	
1				· · · · · · · · · · · · · · · · · · ·	A)
2				Total Newskins of Descioust	
3				Total Number of Dominant Species Across All Strata: 3	В)
4					,
5				Percent of Dominant Species That Are ORL FACW or FAC:	. (5)
5		-		That Are OBL, FACW, or FAC: (A/B)
6				Prevalence Index worksheet:	
7				Total % Cover of: Multiply by:	
		= Total Cov		OBL species x 1 =	
50% of total cover: 0	20% of	total cover	:0		
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =	
1				FAC species x 3 =	
2				FACU species x 4 =	
3				UPL species x 5 =	
4				Column Totals: (A)	(B)
5					
				Prevalence Index = B/A =	
6		-		Hydrophytic Vegetation Indicators:	
7				1 - Rapid Test for Hydrophytic Vegetation	
8		-		2 - Dominance Test is >50%	
9				3 - Prevalence Index is ≤3.0 ¹	
_		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide suppo	ortina
50% of total cover:0	20% of	total cover	:0	data in Remarks or on a separate sheet)	9
Herb Stratum (Plot size: 5')					
1. Bidens frondsa	15		FACW	Problematic Hydrophytic Vegetation ¹ (Explain))
2. Trifolium repens	25	✓	FACU		
3. Phleum pratense	25	√	FACU	¹ Indicators of hydric soil and wetland hydrology mu	ıst
4 Dactylis glomerata	25	<u> </u>	FACU	be present, unless disturbed or problematic.	
5 Microstegium vimineum	10		FAC	Definitions of Four Vegetation Strata:	
•			- 1710	Tree – Woody plants, excluding vines, 3 in. (7.6 cm	n) or
6				more in diameter at breast height (DBH), regardles	
7				height.	
8				Sapling/Shrub – Woody plants, excluding vines, le	ess
9				than 3 in. DBH and greater than or equal to 3.28 ft	
10				m) tall.	
11				Herb – All herbaceous (non-woody) plants, regardl	lacc
	100	= Total Cov	/er	of size, and woody plants less than 3.28 ft tall.	1000
50% of total cover:50		total cover			
Woody Vine Stratum (Plot size:)				Woody vine – All woody vines greater than 3.28 ft height.	ın
1				neight.	
2		-			
3					
4		-		Hydrophytic	
5				Vegetation Present? Yes No✓	
0		= Total Cov		Present? Tes NO	
50% of total cover:0	20% of	total cover	:0		
Remarks: (Include photo numbers here or on a separate s	heet.)				

Profile Desc	cription: (Describe t	o the depth	needed to docur	nent the i	ndicator	or confirm	the absenc	e of indicators.)	
Depth	Matrix			x Feature		. ,		_	
(inches)	Color (moist)	<u>%</u> _	Color (moist)	%	Type ¹	Loc ²	Texture	_ <u>Re</u>	marks
0-5	10YR 4/3	_100_					GRCL		
5-12	10YR 4/4	_100_					GRCL	_	
								-	
								_	
							-		
								-	
	oncentration, D=Depl	etion, RM=R	Reduced Matrix, MS	S=Masked	Sand Gra	ins.		PL=Pore Lining, M=	
Hydric Soil	Indicators:						Indi	cators for Problen	natic Hydric Soils ³ :
Histosol			Dark Surface					2 cm Muck (A10) (I	
l —— '	pipedon (A2)		Polyvalue Be				148)	Coast Prairie Redo	
	istic (A3)		Thin Dark Su			47, 148)		(MLRA 147, 148	•
	en Sulfide (A4)		Loamy Gleye		F2)			Piedmont Floodpla	, ,
	d Layers (A5) uck (A10) (LRR N)		Depleted Ma Redox Dark		-6)			(MLRA 136, 147 Very Shallow Dark	•
l —	d Below Dark Surface	e (A11)	Depleted Dai					Other (Explain in R	
	ark Surface (A12)	()	Redox Depre						,
Sandy N	Mucky Mineral (S1) (L	RR N,	Iron-Mangan	ese Mass	es (F12) (I	_RR N,			
	A 147, 148)		MLRA 13	•					
	Gleyed Matrix (S4)		Umbric Surfa						ytic vegetation and
	Redox (S5)		Piedmont Flo					etland hydrology m	
	Matrix (S6)		Red Parent N	/laterial (F	21) (MLR	A 127, 147	') u	nless disturbed or p	oroblematic.
Restrictive	Layer (if observed): ourse fragments								
			_						
	ches): 12+		<u> </u>				Hydric So	il Present? Yes	No <u></u> ✓
Remarks:									

Project/Site: Long Ridge Energy Terminal Project City/C	county: Monroe Sampling Date: 11/11/19						
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP06						
Investigator(s): JM, KP Section	on, Township, Range: N/A						
Landform (hillslope, terrace, etc.): Hillslope Local reli	ef (concave, convex, none): Linear Slope (%): 8-12						
Subregion (LRR or MLRA): LRRN Lat: 39.704187	Long: -80.855599 Datum: NAD 83						
Soil Map Unit Name: Vandalia-Sees silt loams, 18 to 35 percent s	slopes NWI classification: None						
Are climatic / hydrologic conditions on the site typical for this time of year? Y	es No (If no, explain in Remarks.)						
Are Vegetation, Soil, or Hydrology significantly distur	bed? Are "Normal Circumstances" present? Yes No						
Are Vegetation, Soil, or Hydrology naturally problems	atic? (If needed, explain any answers in Remarks.)						
SUMMARY OF FINDINGS – Attach site map showing sam	ppling point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes ✓ No Hydric Soil Present? Yes ✓ No No	Is the Sampled Area						
Wetland Hydrology Present? Yes ✓ No	within a Wetland? Yes No						
Remarks: Cowardin Code: PEM HGM: Slope Water Type: RPWWD							
HYDROLOGY							
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)						
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)						
Surface Water (A1) True Aquatic Plants (
High Water Table (A2) Hydrogen Sulfide Ode							
✓ Saturation (A3) ✓ Oxidized Rhizosphere							
Water Marks (B1) Presence of Reduced	. , ,						
Sediment Deposits (B2) Recent Iron Reductio							
Drift Deposits (B3) Thin Muck Surface (C							
Algal Mat or Crust (B4) Other (Explain in Rer							
Iron Deposits (B5)	✓ Geomorphic Position (D2)						
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)						
Water-Stained Leaves (B9)	Microtopographic Relief (D4)						
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)						
Field Observations:							
Surface Water Present? Yes No ✓ Depth (inches):	3						
Water rable resent:							
Saturation Present? Yes <u>✓</u> No Depth (inches): (includes capillary fringe)	Wetland Hydrology Present? Yes <u>√</u> No						
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	vious inspections), if available:						
Remarks:							

VEGETATION (Four Strata) - Use scientific names of plants.

	ames of	ριαπιδ.		Sampling Point: W-KP06
201		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30') 1)		Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2				
3				Total Number of Dominant Species Across All Strata: 2 (B)
<u> </u>				Openies Across All Ottata.
т 5				Percent of Dominant Species That Are ORL FACW or FAC: 100 (A/R)
5				That Are OBL, FACW, or FAC: (A/B)
6				Prevalence Index worksheet:
<i>1</i>				Total % Cover of: Multiply by:
50% of total cover:0		= Total Cov		OBL species x 1 =
	20% 01	total cover.		FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15')				FAC species x 3 =
1				FACU species x 4 =
2				
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				✓ 2 - Dominance Test is >50%
9				
	0	= Total Cov	er	3 - Prevalence Index is ≤3.0¹
50% of total cover: 0	20% of	total cover:	0	4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')			_	data in Remarks or on a separate sheet)
1. Scirpus atrovirens	5		OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Epilobium coloratum	5		FACW	
3. Bidens frondosa	 5		FACW	¹ Indicators of hydric soil and wetland hydrology must
4. Typha angustifolia	10		OBL	be present, unless disturbed or problematic.
5. Microstegium vimineum	50		FAC	Definitions of Four Vegetation Strata:
6 Echinochloa muricata	15		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6. Juncus effusus			FACW	more in diameter at breast height (DBH), regardless of
· ·	5			height.
8. Solidago gigantea			FACW_	Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50	20% of	total cover:	20	Woody vine – All woody vines greater than 3.28 ft in
Woody Vine Stratum (Plot size: 15')				height.
				3
1				
12				
1				
1				Hydrophytic
1				Vegetation
1				Vegetation

(Inchoo)	Matrix Color (moist)	%	Redo: Color (moist)	x Features	Type ¹	Loc ²	Texture		Remarks	
(inches) 0-2	10YR 4/2	90	7.5YR 4/6			M/PL	CL		Nemans	
	-									
2-8	10YR 5/2	90_	7.5YR 4/6	<u> 15</u>	<u> </u>	<u>M</u>	<u>GRCL</u>			
8-16							GRCL_		Disturbed I	ayer
	-									
	oncentration, D=Depl	otion DM-	Poduced Matrix MS		Cand Crair		² Leastion: D		ng, M=Matrix.	
	Indicators:	elion, Rivi-	Reduced Matrix, Mc	s-iviaskeu (Sand Grain	is.			roblematic Hy	dric Soils ³ :
_ Histosol			Dark Surface	(\$7)					A10) (MLRA 1	
	oipedon (A2)		Polyvalue Be		e (S8) (ML	RA 147.			Redox (A16)	<i>,</i>
Black Hi			Thin Dark Su					(MLRA 14	, ,	
	n Sulfide (A4)		Loamy Gleye				P		oodplain Soils	(F19)
_ Stratified	l Layers (A5)		✓ Depleted Mat	trix (F3)				(MLRA 13	6, 147)	
	ck (A10) (LRR N)		Redox Dark S	,	,				/ Dark Surface	
	Below Dark Surface	e (A11)	Depleted Dar				<u> </u>	ther (Expla	in in Remarks))
	ark Surface (A12) lucky Mineral (S1) (L	DD N	Redox Depre			DD NI				
	iucky Mineral (5 i) (L \ 147, 148)	.KK N,	Iron-Mangan MLRA 13		S (F 12) (Lr	KK N,				
	leyed Matrix (S4)		Umbric Surfa	•	/II RA 136	122)	³ Ind	icators of h	ydrophytic veg	etation and
-	edox (S5)		Piedmont Flo						logy must be p	
-	Matrix (S6)		Red Parent N					-	ed or problema	
	ayer (if observed):									
estrictive I	_ayer (if observed):		<u> </u>				Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):		<u> </u>				Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):		_				Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes 🗸	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	. No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type:	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No
estrictive I Type: Depth (inc	_ayer (if observed):						Hydric Soil	Present?	Yes <u>√</u>	No

Wetland ID W-KP06 Cowardin Code PEM Date 11/11/19



Photograph Number <u>57</u>
Photograph Direction NE

Comments:



Photograph Number <u>58</u>
Photograph Direction West

Comments:

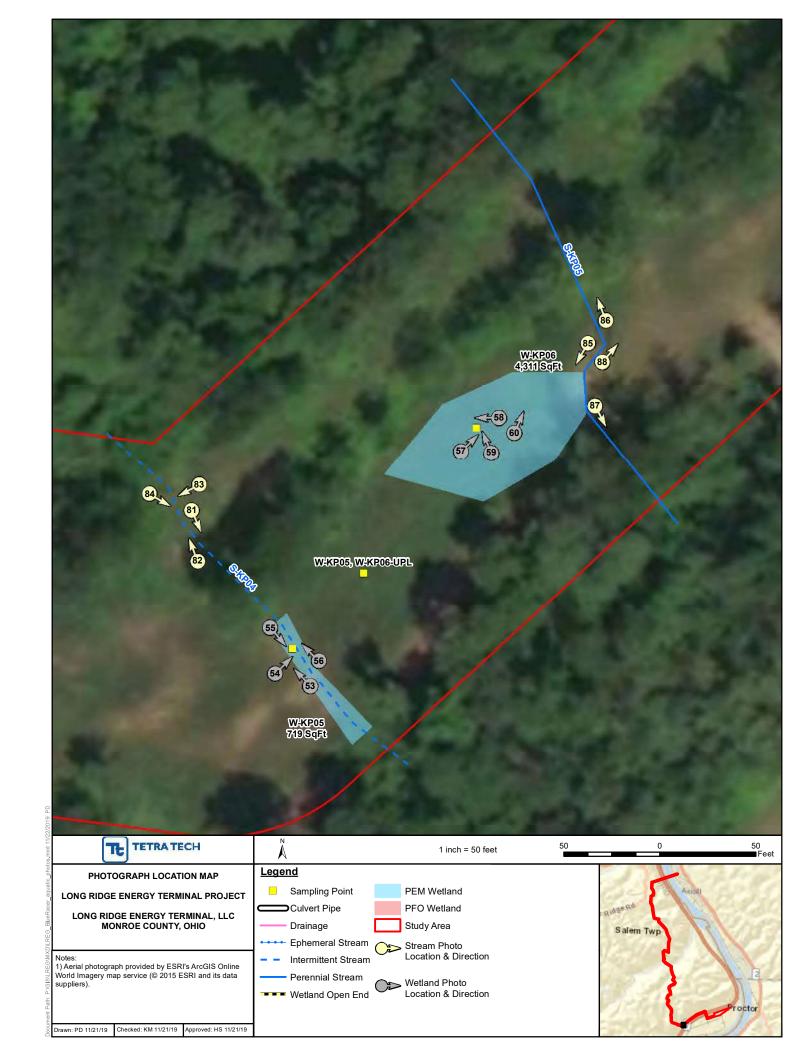


Photograph Number 59
Photograph Direction NNW

Comments:



Photograph Number 60
Photograph Direction NNE



Project/Site: Long Ridge Energy Terminal Pr	roject _{City/C}	ounty: Monroe		_ Sampling Date: 11/11/19
Applicant/Owner: Long Ridge Energy Termin	al, LLC	,		Sampling Point: W-KP07
11.4 145		on, Township, Range: N/		
Landform (hillslope, terrace, etc.): Hillslope				Slope (%): 8-12
Subregion (LRR or MLRA): LRRN	at: 39.705307	Long: -80	.85 <mark>4251</mark>	Datum: NAD 83
Soil Map Unit Name: Made land	at	Long	NWI classifi	cation: None
Are climatic / hydrologic conditions on the site typical	for this time of year? Y			
Are Vegetation, Soil, or Hydrology	•		•	present? Yes <u>√</u> No
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS – Attach site			explain any answe	,
Command of Findings – Attach site	,	pining point locatio	,, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	s, important reatures, etc.
Hydrophytic Vegetation Present? Yes	No	Is the Sampled Area		
Hydric Soil Present? Yes <u>✓</u>	No	within a Wetland?	Yes <u>√</u>	No
Wetland Hydrology Present? Yes <u>✓</u>	No			
Remarks: Cowardin Code: PEM	HGM: Slope	Water Type:	RPWWD	
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indic	ators (minimum of two required)
Primary Indicators (minimum of one is required; che	eck all that apply)		•	l Cracks (B6)
Surface Water (A1)	_ True Aquatic Plants (I	B14)		egetated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Odd		✓ Drainage Pa	
	Oxidized Rhizosphere	, ,	Moss Trim I	
Water Marks (B1)	Presence of Reduced			Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reductio	n in Tilled Soils (C6)	Crayfish Bu	
Drift Deposits (B3)	_ Thin Muck Surface (C	37)	Saturation \	/isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	_ Other (Explain in Ren	narks)	Stunted or S	Stressed Plants (D1)
Iron Deposits (B5)			Geomorphic	Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu	uitard (D3)
Water-Stained Leaves (B9)			Microtopogr	aphic Relief (D4)
Aquatic Fauna (B13)			✓ FAC-Neutra	al Test (D5)
Field Observations:	1			
Surface Water Present? Yes No	Depth (inches):			
	Depth (inches):			_
	Depth (inches):	Wetland H	lydrology Prese	nt? Yes <u>√</u> No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring	well aerial photos pre	vious inspections) if ava	ilable [.]	
Boooniso (tooordou Bata (oubain gauge, morintonii)	y won, donar priotos, pro	vious inspositoris), ii uvu	masio.	
Remarks:				

VEGETATION (Four Strata) – Use scientific names of plants.

	ames of	piants.		Sampling Point: W-KP07
201	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30') 1)		Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC:3(A)
				That / He OBE, 17/07, 011/10.
2				Total Number of Dominant Species Across All Strata: 3 (B)
3				Species Across All Strata:3 (B)
4				Percent of Dominant Species That Are ORL FACW or FAC: 100 (A/R)
5				That Are OBL, FACW, or FAC: (A/B)
5				Prevalence Index worksheet:
7	0 :			Total % Cover of: Multiply by:
50% of total cover:0	$\overline{}$	= Total Cov	_	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')	20% 01	total cover.		FACW species x 2 =
				FAC species x 3 =
1				FACU species x 4 =
2				UPL species x 5 =
3				Column Totals: (A) (B)
1				Column Totals (A) (B)
5				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
3				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
2		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 0	20% of	total cover:	0	data in Remarks or on a separate sheet)
Herb Stratum (Flot Size)	10		OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
1. Scirpus atrovirens	10			
2. Epilobium coloratum	15		FACW	¹ Indicators of hydric soil and wetland hydrology must
3. Bidens frondosa	10		FACW_	be present, unless disturbed or problematic.
4. Typha angustifolia	15		OBL	Definitions of Four Vegetation Strata:
5. Microstegium vimineum	30		FAC	To a Mantagara and all and a control of the control
_{6.} Echinochloa muricata	5		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
{7.} Juncus effusus	5		FACW	height.
_{8.} Solidago sp.	5		ND	Sapling/Shrub – Woody plants, excluding vines, less
_{9.} Carex frankii	5		OBL	than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.
			20	
50% of total cover:50	20% of	total cover:		Woody vine All woody vines greater than 2.29 ft in
	20% of	total cover:		Woody vine – All woody vines greater than 3.28 ft in height.
	20% of	total cover:		Woody vine – All woody vines greater than 3.28 ft in height.
Noody Vine Stratum (Plot size: 15')		total cover:		1 -
Woody Vine Stratum (Plot size: 15') 1		total cover:		1 -
Woody Vine Stratum (Plot size: 15') 1		total cover:		height.
Woody Vine Stratum (Plot size: 15')		total cover:		height. Hydrophytic Vegetation
Noody Vine Stratum (Plot size:15')		total cover:		height.

Depth	ription: (Describe t Matrix	to the dept		x Features	ator or confirm	the absence of	or indicat	ors.)	
(inches)	Color (moist)	%	Color (moist)	% Ty	pe ¹ Loc ²	Texture		Remarks	
0-5	10YR 4/2	95	7.5YR 4/6	5C	M/PL	CL			
<u>5-16</u>	10YR 4/1	95	7.5YR 4/6	5C	<u>M</u>	GRCL_			
						-			
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	3=Masked San	d Grains.	² Location: PL			
Hydric Soil			5 . 6 .	(0-)				roblematic Hy	
Histosol			Dark Surface		0) (84) D.A. 4.47			A10) (MLRA 1 4	47)
Histic Ep Black Hi	oipedon (A2)			rface (S9) (ML	8) (MLRA 147, RA 147, 148)		MLRA 14	e Redox (A16)	
	n Sulfide (A4)		Loamy Gleye		IXA 141, 140)			podplain Soils ((F19)
	Layers (A5)		✓ Depleted Mat				(MLRA 1		()
	ick (A10) (LRR N)		Redox Dark S	` '				v Dark Surface	
	d Below Dark Surface	e (A11)		k Surface (F7)		Ot	her (Expla	in in Remarks)	
	ark Surface (A12)		Redox Depre		40) (1.55.1)				
	lucky Mineral (S1) (L \ 147, 148)	.RR N,	Iron-Mangane	ese Masses (F	12) (LRR N,				
	Gleyed Matrix (S4)			ce (F13) (MLR	Δ 136 122)	³ India	cators of h	ydrophytic veg	etation and
	ledox (S5)				F19) (MLRA 1 4			logy must be p	
	Matrix (S6)				MLRA 127, 147			ed or problema	
Restrictive I	_ayer (if observed):								
Type:								,	
Depth (inc	ches):		<u> </u>			Hydric Soil F	Present?	Yes <u>√</u>	No
Remarks:				,					

Wetland ID W-KP07 Cowardin Code PEM Date 11/11/19



Photograph Number 61
Photograph Direction NNE

Comments:



Photograph Number 62
Photograph Direction East

Comments:

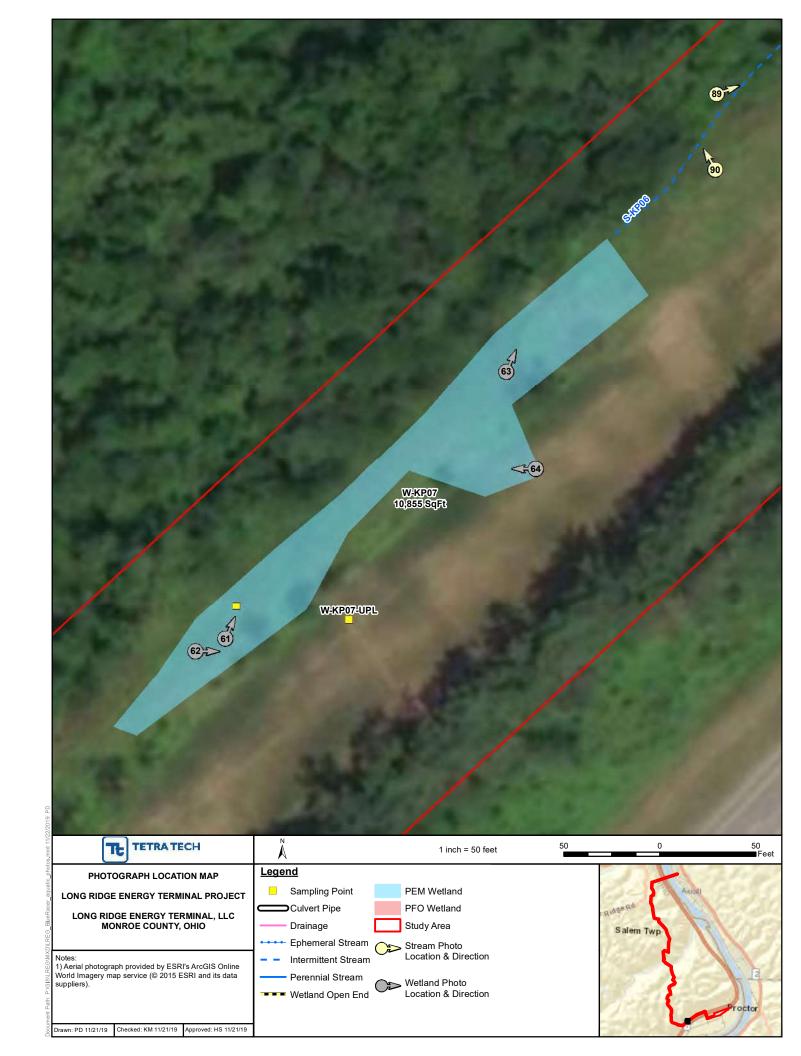


Photograph Number 63
Photograph Direction NNE

Comments:



Photograph Number 64
Photograph Direction West



Project/Site: Long Ridge Energ	gy Terminal Pro	ject (City/County: Mon	roe		_ Sampling Date: 11/11/19		
Applicant/Owner: Long Ridge E	Energy Terminal	, LLC				Sampling Point: W-KP07-UPL		
Investigator(s): JM, KP			Section, Township	Range: N/				
Landform (hillslope, terrace, etc.):						Slope (%): 3-5		
Subregion (LRR or MLRA): LRRI	N Lat	39.705284		Long: -80	.854042	Datum: NAD 83		
Soil Map Unit Name: Made land				<u> </u>		ication: None		
Are climatic / hydrologic conditions		or this time of vea	_					
Are Vegetation, Soil						present? Yes No		
Are Vegetation, Soil						ers in Remarks.)		
SUMMARY OF FINDINGS								
				Ti locatio	ms, transcot	s, important reatures, etc.		
Hydrophytic Vegetation Present?			Is the Sam	oled Area				
Hydric Soil Present?	Yes	,	within a We	etland?	Yes	No <u> </u>		
Wetland Hydrology Present? Remarks: Courardia Codo								
Cowardin Code	:: UPLAND	HGM:	Wat	er Type:				
HYDROLOGY								
Wetland Hydrology Indicators:					Secondary Indic	cators (minimum of two required)		
Primary Indicators (minimum of o	ne is required; chec	k all that apply)			Surface So	il Cracks (B6)		
Surface Water (A1)	<u> </u>	True Aquatic Pla	ants (B14)		Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2)	_	Hydrogen Sulfid			Drainage Patterns (B10)			
Saturation (A3)		Oxidized Rhizos	spheres on Living F	Roots (C3)	Moss Trim	Lines (B16)		
Water Marks (B1)		Presence of Rec	duced Iron (C4)		Dry-Seasor	n Water Table (C2)		
Sediment Deposits (B2)		Recent Iron Rec	duction in Tilled So	ils (C6)	Crayfish Bu	rrows (C8)		
Drift Deposits (B3)	<u>—</u>	Thin Muck Surfa	ace (C7)		Saturation \	Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)		Other (Explain in	n Remarks)		Stunted or	Stressed Plants (D1)		
Iron Deposits (B5)						c Position (D2)		
Inundation Visible on Aerial II	magery (B7)				Shallow Aq			
Water-Stained Leaves (B9)						raphic Relief (D4)		
Aquatic Fauna (B13)					FAC-Neutra	al Test (D5)		
Field Observations:	Na 🗸	Danth (in the sa)						
	es No							
Saturation Present? Ye (includes capillary fringe)	es No	_ Depth (inches):	:	wetiand F	iyarology Prese	ent? Yes No_ ✓		
Describe Recorded Data (stream	gauge, monitoring	well, aerial photos	s, previous inspect	ions), if ava	ilable:			
Remarks:								
İ								

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-KP07-UPL

Tree Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:		
TICC Ottatum (1 lot 3120.	% Cover	Species?	Status	Number of Dominant Species	0	
1				That Are OBL, FACW, or FAC:	0	(A)
2				Total Number of Dominant		
3				Species Across All Strata:	4	(B)
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	0	(A/B)
6						(, , , _)
7				Prevalence Index worksheet:		
	0 :	= Total Cov		Total % Cover of:	Multiply by:	
50% of total cover:0			_	OBL species x	1 =	_
Sapling/Shrub Stratum (Plot size: 15')				FACW species x:	2 =	_
1				FAC species x	3 =	_
			-	FACU species x		
2				UPL species x		
3				Column Totals: (A		
4				Column Totals (A	,	_ (b)
5				Prevalence Index = B/A =		_
6				Hydrophytic Vegetation Indica		_
7				1 - Rapid Test for Hydrophyt		
8				2 - Dominance Test is >50%	-	
9				3 - Prevalence Index is ≤3.0		
	0 =	= Total Cov	/er			nartina
50% of total cover:0	20% of	total cover	: 0	4 - Morphological Adaptation		
Herb Stratum (Plot size: 5'				data in Remarks or on a s		
1. Bidens frondsa	15		FACW	Problematic Hydrophytic Veg	getation (Expla	in)
2 Trifolium repens	20	√	FACU			
3. Phleum pratense	20	<u> </u>	FACU	¹ Indicators of hydric soil and wetl		nust
Dactylis glomerata	20	<u> </u>	FACU	be present, unless disturbed or p		
5 Microstegium vimineum	10		FAC	Definitions of Four Vegetation	Strata:	
6. Solidago canadensis	20		FACU	Tree – Woody plants, excluding	vines. 3 in. (7.6	cm) or
				more in diameter at breast height		
7				height.		
8				Sapling/Shrub – Woody plants,	excluding vines	. less
9				than 3 in. DBH and greater than		
10				m) tall.		
11				Herb – All herbaceous (non-woo	dv) plants. rega	rdless
	105	= Total Cov		of size, and woody plants less the		
50% of total cover: 52.5	20% of	total cover	: <u>21</u>	Woody vine – All woody vines q	restor then 2.20) ft in
Woody Vine Stratum (Plot size: 15')				height.	reater than 3.20)
1				3		
2						
3						
4						
5.				Hydrophytic		
J	0 :			Vegetation Present? Yes	No ✓	
50% of total cover: 0		= Total Cover	_			
		total cover	·			
Remarks: (Include photo numbers here or on a separate s	neet.)					

	•	o the depth r	needed to document the indicator or co	ntirm the abs	ence of indicate	ors.)	
Depth (inches)	Matrix Color (moist)	<u></u> %	Redox Features Color (moist) % Type¹ Loc	c ² Textu	ıre	Remarks	
0-5	10YR 4/2	100		GR			
 5-16	10YR 4/4	100		GRO			
					<u> </u>		
					 -		
					 -		
¹ Type: C=Co	oncentration, D=Depl	etion, RM=Re	educed Matrix, MS=Masked Sand Grains.		on: PL=Pore Lini		
Hydric Soil	Indicators:			!	Indicators for P	roblematic Hydri	c Soils³:
Histosol		-	Dark Surface (S7)	-		A10) (MLRA 147)	
	pipedon (A2)	-	Polyvalue Below Surface (S8) (MLRA			e Redox (A16)	
Black Hi		-	Thin Dark Surface (S9) (MLRA 147, 1	48)	(MLRA 14		
	n Sulfide (A4)	-	Loamy Gleyed Matrix (F2)	-		oodplain Soils (F1	9)
	d Layers (A5) ick (A10) (LRR N)	-	Depleted Matrix (F3) Redox Dark Surface (F6)		(MLRA 13	v Dark Surface (TF	=12\
	d Below Dark Surface	- (A11)	Depleted Dark Surface (F6)	-		in in Remarks)	12)
	ark Surface (A12)		Redox Depressions (F8)	-	Other (Expla	iii iii rtomano,	
	lucky Mineral (S1) (L	RR N,	Iron-Manganese Masses (F12) (LRR I	N,			
	A 147, 148)		MLRA 136)				
	Gleyed Matrix (S4)	_	Umbric Surface (F13) (MLRA 136, 12			ydrophytic vegeta	
	tedox (S5)	-	Piedmont Floodplain Soils (F19) (MLR			logy must be pres	
	Matrix (S6)	-	Red Parent Material (F21) (MLRA 127	⁷ , 147)	unless disturb	ed or problematic	
	_ayer (if observed):						
Type:			_				,
Depth (inc	ches):		_	Hydrid	Soil Present?	Yes N	lo <u>√</u>
Remarks:							

Project/Site: Long Ridge Energy Terminal Project	ct City/County:	Monroe	Samplin	_{g Date:} 11/11/19
Applicant/Owner: Long Ridge Energy Terminal, L	LC		e: OH Samp	
11.4.145	Section, Tow		.o	g <u></u>
Landform (hillslope, terrace, etc.): Hillslope			inear	Slope (%); 8-12
Subregion (LRR or MLRA): LRRN Lat: 3		Long: -80.852		
Soil Map Unit Name: Made land			NWI classification: N	
Are climatic / hydrologic conditions on the site typical for the	his time of year? Ves	7		
Are Vegetation, Soil, or Hydrology	•	Are "Normal Circu	. ,	Vac V Na
Are Vegetation, Soil, or Hydrology			any answers in Rem	,
SUMMARY OF FINDINGS – Attach site map		point locations,	iransects, impor	tant reatures, etc.
Hydrophytic Vegetation Present? Yes <u>✓</u>	No Is the	Sampled Area		
Hydric Soil Present? Yes	NI-	a Wetland?	Yes _ ✓ No _	
Wetland Hydrology Present? Yes <u>✓</u>	No			
Remarks: Cowardin Code: PEM H	GM: Slope	Water Type: RPW	/WN	
HYDROLOGY				
Wetland Hydrology Indicators:		Seco	ndary Indicators (mini	mum of two required)
Primary Indicators (minimum of one is required; check a	Il that apply)		Surface Soil Cracks (E	
	rue Aquatic Plants (B14)		Sparsely Vegetated Co	
	ydrogen Sulfide Odor (C1)		Drainage Patterns (B1	
	xidized Rhizospheres on Li		Moss Trim Lines (B16)	·
	resence of Reduced Iron (0		Dry-Season Water Tal	
Sediment Deposits (B2) Re	ecent Iron Reduction in Till	ed Soils (C6) (Crayfish Burrows (C8)	
Drift Deposits (B3)	nin Muck Surface (C7)	\$	Saturation Visible on A	verial Imagery (C9)
Algal Mat or Crust (B4) Ot	ther (Explain in Remarks)		Stunted or Stressed P	ants (D1)
Iron Deposits (B5)		(Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aquitard (D3)	
Water-Stained Leaves (B9)			/licrotopographic Reli	, ,
Aquatic Fauna (B13)		<u>√</u> F	AC-Neutral Test (D5)	
Field Observations:				
Surface Water Present? Yes No V	Depth (inches):			
	Depth (inches):			/
Saturation Present? Yes No D (includes capillary fringe)	Depth (inches):	Wetland Hydro	ogy Present? Yes	No
Describe Recorded Data (stream gauge, monitoring well	l, aerial photos, previous in	spections), if available:		
Remarks:				
Remarks.				

VEGETATION (Four Strata) - Use scientific names of plants

/EGETATION (Four Strata) – Use scientific n	ames of	plants.		Sampling Point: W-KP08
201		Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size:)	% Cover	Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC:5 (A)
2				Total Number of Dominant
3				Species Across All Strata:5 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6				
7				Prevalence Index worksheet:
	0	= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:0	20% of	total cover	. 0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1				FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				Provolence Index = P/A =
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
9.				✓ 2 - Dominance Test is >50%
	0	= Total Cov	er	3 - Prevalence Index is ≤3.0¹
50% of total cover:0	20% of	total cover	0	4 - Morphological Adaptations (Provide supporting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1. Scirpus atrovirens	10		OBL	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Ebilobium coloratum	15	✓	FACW	
3. Bidens frondosa	15	✓	FACW	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. Symphyotrichum ericoides	5		FACU	Definitions of Four Vegetation Strata:
5. Microstegium vimineum	10		FAC	Definitions of Four Vegetation Strata.
6. Ebilobium coloratum	10		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7. Juncus effusus	15	<u>√</u>	FACW	more in diameter at breast height (DBH), regardless of height.
8. Solidago gigantea	5		FACW	
g Carex frankii	15	$\overline{}$	OBL	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
10. Juncus tenuis	15	$\overline{}$	FAC	m) tall.
11.				
	115	= Total Cov	er	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 57.				
Woody Vine Stratum (Plot size: 15')	_			Woody vine – All woody vines greater than 3.28 ft in height.
1.				neight.
2.				
3				
4.				
5.			·	Hydrophytic Vegetation
<u>. </u>	0	= Total Cov		Present? Yes No
50% of total cover: 0		total cover:	_	
<u> </u>				
Remarks: (Include photo numbers here or on a separate s	heet.)			

Depth	cription: (Describe Matrix		Redo	x Features			·
(inches)	Color (moist)	<u>%</u>	Color (moist)		ype ¹ Loc ²	Texture	Remarks
0-9	5YR 4/2	95	7.5YR 4/6	5C	<u> </u>	CL	
9-16	5YR 5/2	90	7.5YR 4/6	10 <u>C</u>	<u> </u>	GRCL_	
		· ——					
		· ——					
Гуре: С=Со	oncentration, D=Dep	letion, RM=	Reduced Matrix, MS	S=Masked Sa	nd Grains.	² Location: PL=	=Pore Lining, M=Matrix.
ydric Soil I	Indicators:					Indicate	ors for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	e (S7)		2 c	m Muck (A10) (MLRA 147)
	pipedon (A2)				S8) (MLRA 14 7	· —	ast Prairie Redox (A16)
Black Hi					LRA 147, 148)		MLRA 147, 148)
	n Sulfide (A4)			ed Matrix (F2)			edmont Floodplain Soils (F19)
	Layers (A5)		✓ Depleted Ma				(MLRA 136, 147)
	ick (A10) (LRR N) d Below Dark Surface	o (A11)	Redox Dark	Suпасе (F6) rk Surface (F7	`		ry Shallow Dark Surface (TF12) ner (Explain in Remarks)
	ark Surface (A12)	e (ATT)	Redox Depre	•	,	Ou	iei (Expiaiii iii Neiliaiks)
	lucky Mineral (S1) (L	_RR N.		ese Masses (I	=12) (LRR N .		
	\ 147, 148)	,	MLRA 13		, (,		
	Gleyed Matrix (S4)			, nce (F13) (ML I	RA 136, 122)	³ Indic	ators of hydrophytic vegetation and
	ledox (S5)				(F19) (MLRA 1		and hydrology must be present,
Stripped	Matrix (S6)		Red Parent N	Material (F21)	(MLRA 127, 14	(7) unle	ss disturbed or problematic.
Restrictive L	_ayer (if observed):						
Type:							
Depth (ind	ches):					Hydric Soil P	Present? Yes <u>√</u> No
Remarks:							

Wetland ID W-KP08 Cowardin Code PEM Date 11/11/19



Photograph Number 65

Photograph Direction NE

Comments:



Photograph Number 66
Photograph Direction SSE

Comments:



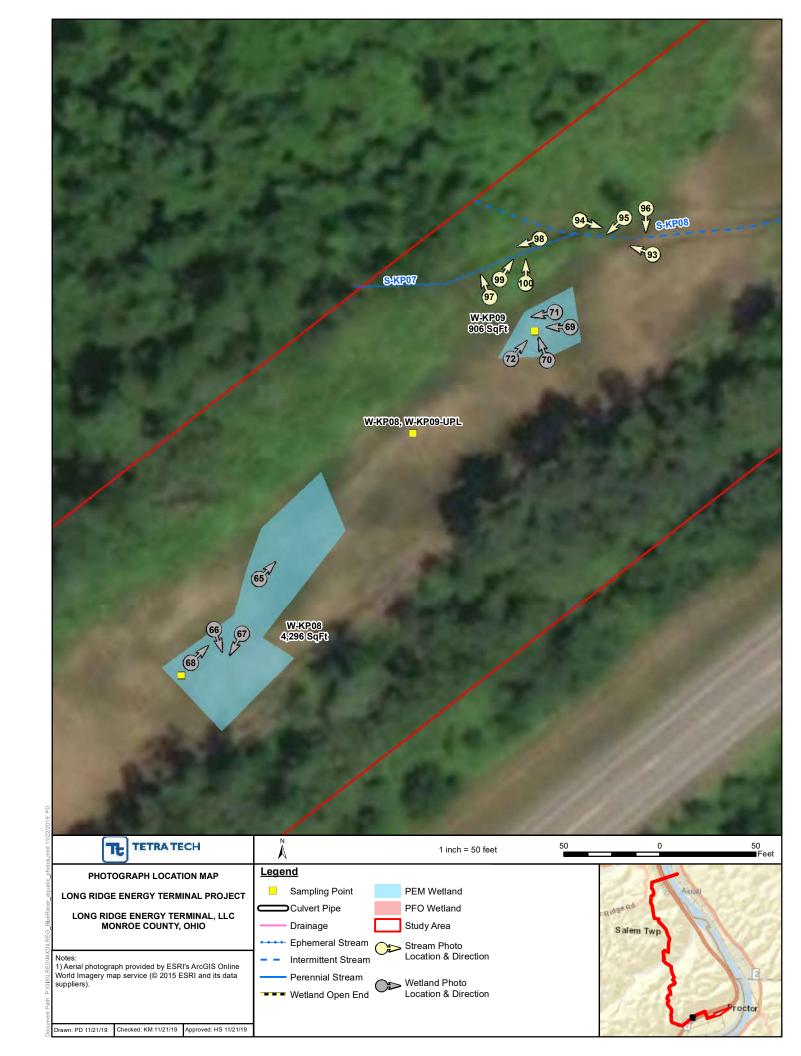
Photograph Number 67
Photograph Direction SSW

Comments:



Photograph Number 68

Photograph Direction NE



poplicant/Owner: Long Ridge Energy Terminal, LLC State: OH Sampling Point: W-KP08,W-KP09-UPL nvestigator(s): JM, KP Section, Township, Range; N/A andform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 3-5 subregion (LRR or MLRA): LRRN Lat: 39.706778 Long: -80.851806 Datum; NAD 83 soil Map Unit Name: Sees-Woolper silt loams, 18 to 35 percent slopes NWI classification: None are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.) are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS − Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes No Wetland Hydrology Present? Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes	Project/Site: Long Ridge Energy Terminal Project City/County: Monroe	Sampling Date: 11/11/19
Section Township Range NA	Applicant/Owner: Long Ridge Energy Terminal, LLC	
Local relief (concave, corrivex, none): Linear Slope (%): 3-5 Lubregion (LRR or MLRA) LRRN Lat: 39.706778 Long: -80.851806 Datum: NAD 83 Join Map Unit Name: Sees-Woolper sitt loams, 18 to 35 percent slopes Long: -80.851806 New York (Pro. explain in Remarks.) Long: -80.851806 N	Investigator(s): JM, KP Section, Township, Range	_{e:} N/A
ubregion (LRR or MLRA): LRRN Lat: 39.706778 Long: 80.85180b Datum: NAD 83 old Map Unit Name: Sees-Woolper silt loams, 18 to 35 percent slopes net climatic / hydrologic conditions on the sile typical for this time of year? Yes ✓ No (no. explain in Remarks.) re Vegetation Soil or Hydrology alginificantly disturbed? Are "Normal Circumstances" present? Yes ✓ No (if needed, explain any answers in Remarks.) SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No ✓ Is the Sampled Area within a Wetland? Yes No ✓ Water Type: Water Type: Water Type: Water Type: Water Type: Water Hydricsoli Present? Yes No ✓ Water Sunday Indicators (minimum of two required) High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Most This Living Presents (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Sediment Deposits (B3) Thin Muck Surface (C7) Saturation (D2) Sturate (D3) Introdeposits (B4) Genomic Presents (B4) High Water Table (C2) Genomic Presents (B4) Genomic Presents (B5) Genomic Presents (B6)	Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex	(, none): Linear Slope (%): 3-5
None None	Subregion (LRR or MLRA): LRRN Lat: 39.706778 Long:	-80.851806 Datum: NAD 83
re Vegetation Soil or Hydrology significantly disturbed?		
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SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No Welland Hydrology Present? Yes No Welland Hydrology Present? Yes No Welland Hydrology Present? Yes No Welland Hydrology Indicators: Remarks: Cowardin Code: UPLAND HGM: Water Type: Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Surface Water (A1) True Aquatic Plants (B14) Saturation (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Welter Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2) Sediment Deposits (B2) Recent for Reduction in Tilled Soils (C6) Craffsh Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) Fac-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Water Table (Resent) Present? Yes No Depth (inches): Water Table (Stream gauge, monitoring well, aerial photos, previous inspections), if available:		
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No /	· — · · · · · · · · · · · · · · · · · ·	· ——
Hydrophytic Vegetation Present? Yes No Wetland Hydrology Present? Yes No Wetland Hydrology Present? Yes No Wetland Hydrology Present? Yes No Wetland Hydrology Present? Yes No Wetland Hydrology Present? Yes No Wetland Hydrology Indicators: Wetland Hydrology Indicators:		
Hydric Soil Present? Yes No V Wetland Hydrology Present? Yes No V Wetland Hydrology Present? Water Type: Water Type: Water Type: Water Type:	SUMMARY OF FINDINGS – Attach site map showing sampling point loc	ations, transects, important features, etc.
Hydric Soil Present? Yes No V within a Wetland? Yes No V Wetland Hydrology Present? Yes No V Wetland Hydrology Present? Yes No V Wetland Hydrology Indicators: Frimary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) High Water Table (A2) Hydrogen Sulfide Odor (C1) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) Sediment Deposits (B2) Recent Iron Reduction in Titled Soils (C6) Algal Mat or Crust (B4) Other (Explain in Remarks) Jenson Deposits (B5) Induction Hydrology Indicators (minimum of two required) Saturation (Va) Sediment Deposits (B2) Algal Mat or Crust (B4) Versence of Reduced Iron (C4) Sediment Deposits (B2) Algal Mat or Crust (B4) Versence of Reduced Iron (C4) Sutration (Visible on Aerial Imagery (C9) Sutration Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Water-Stained Leaves (B9) Aquatic Fauna (B13) Field Observations: Surface Water Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No V Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Hydrophytic Vegetation Present? Yes No	roa
APDROLOGY Wetland Hydrology Indicators: Secondary Indicators (minimum of two required)	Hydric Soil Present? Yes No ✓ within a Wetland?	
APDROLOGY Wetland Hydrology Indicators: Secondary Indicators (minimum of two required)	Wetland Hydrology Present? Yes No ✓	
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): <t< td=""><td>Remarks: Cowardin Code: UPLAND HGM: Water Ty</td><td>pe:</td></t<>	Remarks: Cowardin Code: UPLAND HGM: Water Ty	pe:
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): <t< td=""><td></td><td></td></t<>		
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Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Primary Indicators (minimum of one is required; check all that apply) Surface Soil Cracks (B6) Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): <t< td=""><td>HYDROLOGY</td><td></td></t<>	HYDROLOGY	
Surface Water (A1)	Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
High Water Table (A2) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Moss Trim Lines (B16) Water Marks (B1) Presence of Reduced Iron (C4) Dry-Season Water Table (C2) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No ✓ Depth (inches): Water Table Present? Yes No ✓ Depth (inches): Wetland Hydrology Present? Yes No ✓ Depth (inches): Wetland Hydrology Present? Yes No ✓ Depth (inches): Saturation Present? Yes No ✓ Depth (inches): Surface Capillary fringe)	Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
High Water Table (A2)	Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
Water Marks (B1)	High Water Table (A2) Hydrogen Sulfide Odor (C1)	
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Crayfish Burrows (C8) Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Saturation Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Secribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Saturation (A3) Oxidized Rhizospheres on Living Roots (0	C3) Moss Trim Lines (B16)
Drift Deposits (B3) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C9) Algal Mat or Crust (B4) Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Shallow Aquitard (D3) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Sturface Water Present? Yes No ✓ Depth (inches): Water Table Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches): Sturation Present? Yes No ✓ Depth (inches):_ Sturatio	Water Marks (B1) Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Algal Mat or Crust (B4)Other (Explain in Remarks) Stunted or Stressed Plants (D1) Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Aquatic Fauna (B13) FAC-Neutral Test (D5) Sturface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Wetland Hydrology Present? Yes No ✓ Depth (includes capillary fringe) Sturies on the following previous inspections in the following previous inspectio	Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Aquatic Fauna (B13) FAC-Neutral Test (D5) FAC-Neutral Test (D5) Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Wetland Hydrology Present? Yes No ✓ Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Inundation Visible on Aerial Imagery (B7) Shallow Aquitard (D3) Water-Stained Leaves (B9) Microtopographic Relief (D4) Aquatic Fauna (B13) FAC-Neutral Test (D5) Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Depth (includes capillary fringe) Wetland Hydrology Present? Yes No Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		· · ·
Aquatic Fauna (B13)FAC-Neutral Test (D5) Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Field Observations: Surface Water Present? Yes No _ ✓ Depth (inches): Water Table Present? Yes No _ ✓ Depth (inches): Saturation Present? Yes No _ ✓ Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		PAC-Neutral Test (D3)
Water Table Present? Yes No ✓ _ Depth (inches): Saturation Present? Yes No ✓ _ Depth (inches): Wetland Hydrology Present? Yes No ✓ _ (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Saturation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Water Table Present? Yes No ✓ Depth (inches):	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	·	and Hydrology Present? Yes No ✓
	(includes capillary fringe)	
Remarks:	Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if	f available:
	Remarks:	
	Tomano.	

0.01	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size:)	% Cover	Species?	Status	Number of Dominant Species	
1				That Are OBL, FACW, or FAC:0	(A)
2					
				Total Number of Dominant Species Across All Strata: 2	(D)
3				Species Across All Strata:	(B)
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC:	(A/B)
6				Prevalence Index worksheet:	
7					
		= Total Cov		Total % Cover of: Multiply by:	
50% of total cover:0	20% of	total cover	0	OBL species x 1 =	
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =	_
1				FAC species x 3 =	_
2				FACU species x 4 =	_
3.				UPL species x 5 =	
				Column Totals: (A)	
4		-	· ——	()	_ (-)
5				Prevalence Index = B/A =	
6				Hydrophytic Vegetation Indicators:	
7				1 - Rapid Test for Hydrophytic Vegetation	
8				2 - Dominance Test is >50%	
9.					
	0	= Total Cov	er	3 - Prevalence Index is ≤3.0 ¹	
50% of total cover: 0		total cover	_	4 - Morphological Adaptations ¹ (Provide sup	porting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)	
1. Bidens frondsa	10		FACW	Problematic Hydrophytic Vegetation ¹ (Expla	in)
2 Trifolium repens	30		FACU		
3. Phleum pratense	15			¹ Indicators of hydric soil and wetland hydrology i	must
			FACU	be present, unless disturbed or problematic.	
4. Dactylis glomerata	10		FACU	Definitions of Four Vegetation Strata:	
5. Microstegium vimineum	5		FAC		
6. Solidago canadensis	30		FACU	Tree – Woody plants, excluding vines, 3 in. (7.6	
7				more in diameter at breast height (DBH), regard height.	less of
8				115.g.1.s.	
0				Sapling/Shrub – Woody plants, excluding vines	
9				than 3 in. DBH and greater than or equal to 3.28 m) tall.	3 ft (1
10				iii) taii.	
11	400			Herb – All herbaceous (non-woody) plants, rega	rdless
50		= Total Cov	~~	of size, and woody plants less than 3.28 ft tall.	
50% of total cover: 50	20% of	total cover	20	Woody vine – All woody vines greater than 3.28	R ft in
Woody Vine Stratum (Plot size: 15')				height.	,
1					
2					
3					
4					
5				Hydrophytic	
<u></u>	0			Vegetation Present? Yes No _✓	
50% of total cover: 0		= Total Cov total cover	_		
		total cover			
Remarks: (Include photo numbers here or on a separate s	neet.)				

Profile Desc	cription: (Describe t	to the depth	needed to docur	nent the i	indicator	or confirm	the absence	e of indicat	ors.)		
Depth	Matrix			x Feature					_		
(inches)	Color (moist)	<u>%</u>	Color (moist)	<u></u> %	Type ¹	Loc ²	Texture	_	Remarks	3	
0-7	10YR 4/2	_100_					GRCL	_			
7-12	10YR 4/4	_100_					GRCL	_			
			_								
								_			
								_			
	-							_			
								_			
	oncentration, D=Depl	etion, RM=R	educed Matrix, MS	S=Masked	Sand Gra	ins.			ning, M=Matri		
Hydric Soil	Indicators:						Indi	cators for F	roblematic l	Hydric Soils ³	:
Histosol			Dark Surface						(A10) (MLRA		
l —— '	pipedon (A2)		Polyvalue Be				148)		e Redox (A16	6)	
	istic (A3)		Thin Dark Su			47, 148)		(MLRA 1			
	en Sulfide (A4)		Loamy Gleye		(F2)		_		loodplain Soil	s (F19)	
l —	d Layers (A5) uck (A10) (LRR N)		Depleted Ma Redox Dark	. ,	E6)			(MLRA 1	ახ , 147) w Dark Surfa	oo (TE12)	
l —	d Below Dark Surface	e (A11)	Depleted Dai				_	•	ain in Remark	, ,	
	ark Surface (A12)	, (,)	Redox Depre				_	O (2,4p.		,	
	/ //ucky Mineral (S1) (L	.RR N,	Iron-Mangan			_RR N,					
	A 147, 148)		MLRA 13								
	Gleyed Matrix (S4)		Umbric Surfa							egetation and	
	Redox (S5)		Piedmont Flo					-	ology must be		
	d Matrix (S6)		Red Parent N	/laterial (F	21) (MLR	A 127, 147	7) ı	ınless distur	bed or proble	matic.	
Restrictive	Layer (if observed):										
	ourse fragments		_							,	
Depth (in	ches): <u>12+</u>		_				Hydric Sc	oil Present?	Yes	No <u></u> ✓	_
Remarks:											

Project/Site: Long Ridge Energy Terminal F	Project City/C	_{ounty:} Monroe		Sampling Date: 11/11/19
Applicant/Owner: Long Ridge Energy Termi				Sampling Point: W-KP09
	Section			
Landform (hillslope, terrace, etc.): Hillslope				Slope (%): 8-12
Subregion (LRR or MLRA): LRRN	Lang: -80	.851577	Datum: NAD 83	
Soil Map Unit Name: Sees-Woolper silt loam	s. 18 to 35 percent s	lones	NIWI classifi	cation: None
Are climatic / hydrologic conditions on the site typic				
	-			
Are Vegetation, Soil, or Hydrology				present? Yes No
Are Vegetation, Soil, or Hydrology			explain any answe	,
SUMMARY OF FINDINGS – Attach site	e map showing sam	pling point location	ons, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes	✓No			
Hydric Soil Present? Yes	✓ No	Is the Sampled Area	V /	No
Wetland Hydrology Present? Yes	✓ No	within a Wetland?	resv	NO
Remarks: Cowardin Code: PEM	HGM: Slope	Water Type:	RPWWN	
Gowardin Gode. Elvi	TIOW. Clope	water Type.	I II VVVVIV	
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indic	ators (minimum of two required)
Primary Indicators (minimum of one is required; c	heck all that apply)			Cracks (B6)
Surface Water (A1)	True Aquatic Plants (I		,	getated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Odd	, ,	✓ Drainage Pa	
Saturation (A3)	✓ Oxidized Rhizosphere		Moss Trim L	
Water Marks (B1)	Presence of Reduced	` '		Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction		Crayfish Bu	
Drift Deposits (B3)	Thin Muck Surface (C			/isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Ren	narks)		Stressed Plants (D1)
Iron Deposits (B5)				Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu	
Water-Stained Leaves (B9)			aphic Relief (D4)	
Aquatic Fauna (B13)			✓ FAC-Neutra	Test (D5)
Field Observations: Surface Water Present? Yes No	✓ Depth (inches):			
Water Table Present? Yes No	Depth (inches):			
Saturation Present? Yes No (includes capillary fringe)	✓ Depth (inches):	Wetland F	lydrology Prese	nt? Yes <u>√</u> No
Describe Recorded Data (stream gauge, monitori	ng well, aerial photos, pre	vious inspections), if ava	ilable:	
Remarks:				
Remarks.				

EGETATION (Four Strata) – Use scientific	names of	plants.		Sampling Point: W-KP09
30'	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30')		Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC:4 (A)
3.				Total Number of Dominant Species Across All Strata: 4 (B)
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
6				
7				Prevalence Index worksheet:
	0	= Total Cov	er er	Total % Cover of: Multiply by:
50% of total cover:	20% of	total cover	0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1				FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6		-		Hydrophytic Vegetation Indicators:
7				✓ 1 - Rapid Test for Hydrophytic Vegetation
8				✓ 2 - Dominance Test is >50%
9		-		3 - Prevalence Index is ≤3.0¹
		= Total Cov	er _	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover:	20% of	total cover	:0	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 5')	40		OBL	Problematic Hydrophytic Vegetation¹ (Explain)
1. Scirpus atrovirens	_ 10			resistance rigarephysic regulation (Explain)
2. Epilobium coloratum	_ 15		FACW	¹ Indicators of hydric soil and wetland hydrology must
3. Bidens frondosa	_ 15		FACW_	be present, unless disturbed or problematic.
4. Symphyotrichum ericoides	_ 5		FACU_	Definitions of Four Vegetation Strata:
5. Microstegium vimineum	_ 5		FAC FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
6. Echinochloa muricata	_ 5			more in diameter at breast height (DBH), regardless of
7. Juncus effusus	_ 25	√	FACW	height.
8. Solidago gigantea			FACW_	Sapling/Shrub – Woody plants, excluding vines, less
9. Carex frankii	<u>20</u>		OBL FAC	than 3 in. DBH and greater than or equal to 3.28 ft (1
10. Juncus tenuis		-		m) tall.
11. Scirpus cyperinus	_ 5		FACW_	Herb – All herbaceous (non-woody) plants, regardless
50% of total cover: 57		= Total Cov		of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 15')	<u>.J</u> 20% 01	total cover		Woody vine - All woody vines greater than 3.28 ft in
				height.
1 2.				
3				
J	_			
5.	_			Hydrophytic
<u>. </u>	0	= Total Cov	. ———	Vegetation Present? Yes✓ No
50% of total cover:		total cover	_	
Remarks: (Include photo numbers here or on a separate				

Depth	cription: (Describe to Matrix	to the dept		x Features	cator or confirm	n the absence of	indicators.)
(inches)	Color (moist)	%	Color (moist)	% Ty	ype ¹ Loc ²	Texture	Remarks
0-5	7.5YR 4/2	90	7.5YR 4/6	5 C	: M/PL	GRCL	
5-16	7.5YR 4/1	90	7.5YR 4/6		M/PL	GRCL	
	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	=Masked Sar	nd Grains.		Pore Lining, M=Matrix.
Hydric Soil				(0=)			rs for Problematic Hydric Soils ³ :
Histosol			Dark Surface		CO) (841 D A 447		n Muck (A10) (MLRA 147)
Histic Ep Black Hi	oipedon (A2)		· ·		S8) (MLRA 147, LRA 147, 148)		st Prairie Redox (A16) //LRA 147, 148)
	en Sulfide (A4)		Inin Dark Su Loamy Gleye		LIVM 141, 140)		ILKA 147, 148) Imont Floodplain Soils (F19)
	d Layers (A5)		✓ Depleted Mat				/ILRA 136, 147)
	ick (A10) (LRR N)		Redox Dark S				/ Shallow Dark Surface (TF12)
	d Below Dark Surface	e (A11)		k Surface (F7)		er (Explain in Remarks)
Thick Da	ark Surface (A12)		Redox Depre	ssions (F8)			
	lucky Mineral (S1) (L	.RR N,	Iron-Mangane		=12) (LRR N,		
	A 147, 148)		MLRA 130	•		2	
	Gleyed Matrix (S4)		Umbric Surfa				tors of hydrophytic vegetation and
	Redox (S5)				(F19) (MLRA 1 4		nd hydrology must be present,
	Matrix (S6)		Red Parent N	laterial (F21)	(MLRA 127, 147	7) unles	s disturbed or problematic.
	Layer (if observed):						
Type:	-t \					Hardela Call Da	
Depth (in	cnes):					Hydric Soil Pr	resent? Yes <u> </u>
Remarks:							

Wetland ID W-KP09 Cowardin Code PEM Date 11/11/19



Photograph Number 69
Photograph Direction West

Comments:



Photograph Number 70
Photograph Direction NNW

Comments:



Photograph Number 71

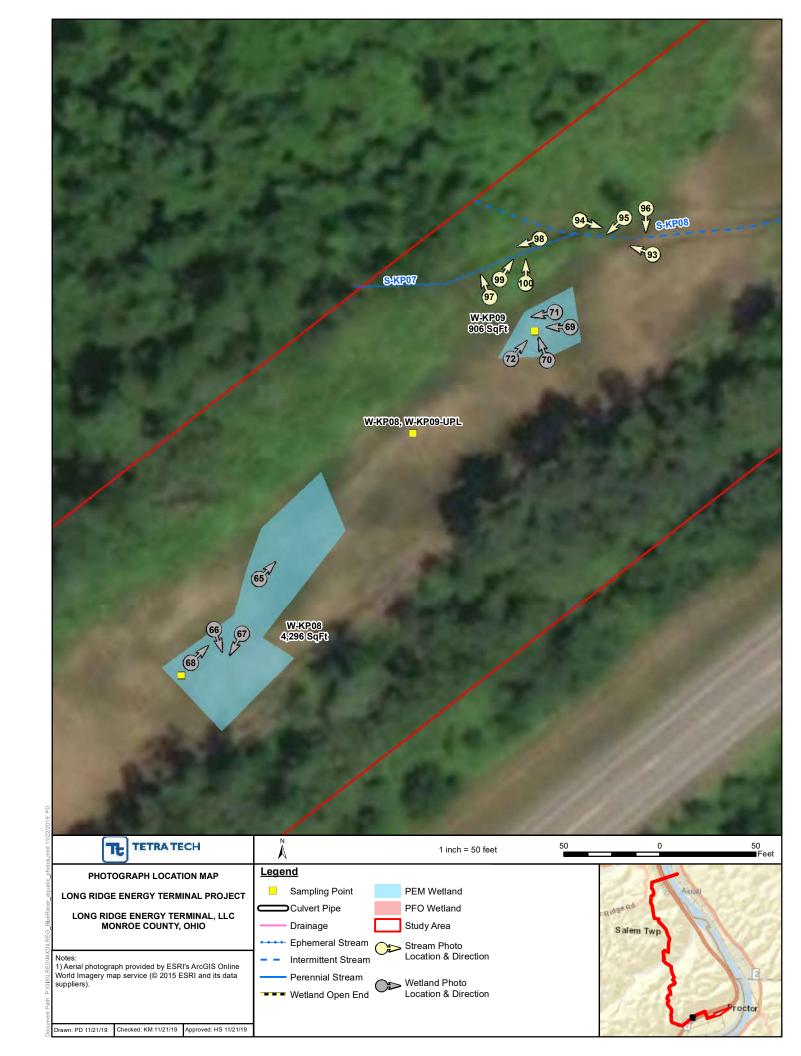
Photograph Direction WSW

Comments:



Photograph Number 72

Photograph Direction NE



Project/Site: Long Ridge Energy Terminal Project	ity/County: Monroe Sampling Date: 11/12/2019					
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP10					
Investigator(s): JM, KP Section, Township, Range: N/A						
Landform (hillslope, terrace, etc.): Hillslope Loca	I relief (concave, convex, none): Linear Slope (%): 5-7					
	Long: -80.844767 Datum: NAD 83					
Soil Map Unit Name: Made land	NWI classification: None					
Are climatic / hydrologic conditions on the site typical for this time of year						
Are Vegetation, Soil, or Hydrology significantly di						
Are Vegetation, Soil, or Hydrology naturally problem.						
	sampling point locations, transects, important features, etc.					
, ,	, , , , , , , , , , , , , , , , , , , ,					
Hydrophytic Vegetation Present? Yes ✓ No No No No No No No No No No No No No	Is the Sampled Area					
Hydric Soil Present? Wetland Hydrology Present? Yes ✓ No No No No No No No No No No	within a Wetland? Yes No					
	Water Type: RPW/WNI					
Remarks: Cowardin Code: PEM HGM: Slope	Water Type: RPWWN					
HADBOLOGA						
HYDROLOGY Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply)						
	Surface Soil Cracks (B6) nts (B14) Sparsely Vegetated Concave Surface (B8)					
✓ Surface Water (A1) True Aquatic Plar ✓ High Water Table (A2) Hydrogen Sulfide						
1 	bheres on Living Roots (C3) Moss Trim Lines (B16)					
Water Marks (B1) Presence of Redu						
	uction in Tilled Soils (C6) Crayfish Burrows (C8)					
Drift Deposits (B3) Thin Muck Surfac						
Algal Mat or Crust (B4) Other (Explain in						
Iron Deposits (B5)	✓ Geomorphic Position (D2)					
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)					
Water-Stained Leaves (B9)	Microtopographic Relief (D4)					
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)					
Field Observations:	0.5					
Surface Water Present? Yes ✓ No Depth (inches):_						
Water Table Present? Yes ✓ No Depth (inches):_						
Saturation Present? Yes No Depth (inches):_ (includes capillary fringe)	U Wetland Hydrology Present? Yes _ ✓ No					
Describe Recorded Data (stream gauge, monitoring well, aerial photos,	previous inspections), if available:					
Remarks:						
Remarks.						

Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 2
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/IIII) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species
Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: Prevalence Index worksheet: Total % Cover of: OBL species
Species Across All Strata: 2 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/E Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species x1 = FACW species x2 = FAC species x3 = FACU species x4 = UPL species x5 = Column Totals: (A) (B) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation ✓ 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) **TACW** OBL** OBL** OBL** OBL** OBL** Definitions of Four Vegetation Strata:
Percent of Dominant Species That Are OBL, FACW, or FAC: Prevalence Index worksheet: Total % Cover of: Multiply by:
That Are OBL, FACW, or FAC: 100 (A/E Prevalence Index worksheet:
That Are OBL, FACW, or FAC: 100 (A/E Prevalence Index worksheet:
Prevalence Index worksheet: Total % Cover of:
Total % Cover of: OBL species FACW species FACU Species FACU Specie
OBL species
FACW species
FAC species x 3 =
FACU species x 4 =
UPL species x 5 = (A) (B Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) OBL OBL OBL OBL Definitions of Four Vegetation Strata:
Column Totals: (A) (B Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation ✓ 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) FACW OBL OBL OBL Definitions of Four Vegetation Strata:
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation
Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation
1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) FAC FACW OBL OBL OBL Definitions of Four Vegetation Strata:
✓ 2 - Dominance Test is >50% — 3 - Prevalence Index is ≤3.0¹ — 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) ✓ FACW OBL OBL OBL OBL OBL OBL
al Cover
al Cover cover: 0
data in Remarks or on a separate sheet) FAC OBL OBL OBL OBL OBL Definitions of Four Vegetation Strata:
FAC FACW OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL
FACW OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL
OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL
Definitions of Four Vegetation Strata:
OBL Definitions of Four Vegetation Strata:
OBL OBL
FACW Tree – Woody plants, excluding vines, 3 in. (7.6 cm) of
more in diameter at breast height (DBH), regardless of
FACW height.
FAC South of Charles Was do a lands a south discussion as land
Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
m) tall.
——— Herb – All herbaceous (non-woody) plants, regardles
of size, and woody plants less than 3.28 ft tall.
cover: 20
Woody vine – All woody vines greater than 3.28 ft in height.
Hydrophytic Vegetation
Present? Yes No
cover: 0
al

Sampling Point: W-KP10

SOIL

Profile Desc	ription: (Describe t	o the depti	n needed to docum	nent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-5	10YR 3/1	100					OSIL	
5-16	10YR 4/2	50	10YR 4/6	10		M/PL	CL	
	10YR 5/1	40	101111110					
	1018 5/1							
						· ——		-
-						· ——		
	oncentration, D=Depl	etion, RM=F	Reduced Matrix, MS	=Masked	Sand Gr	ains.		L=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:						Indica	ators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	(S7)			2	cm Muck (A10) (MLRA 147)
Histic Ep	ipedon (A2)		Polyvalue Be	low Surfac	ce (S8) (N	/ILRA 147,	148) C	coast Prairie Redox (A16)
Black His	stic (A3)		Thin Dark Su	rface (S9)	(MLRA	147, 148)		(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		F2)		P	riedmont Floodplain Soils (F19)
	l Layers (A5)		✓ Depleted Mat					(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark S					ery Shallow Dark Surface (TF12)
	Below Dark Surface	e (A11)	Depleted Dar				c	other (Explain in Remarks)
	rk Surface (A12)		Redox Depre					
	lucky Mineral (S1) (L	RR N,	Iron-Mangane		es (F12) (LRR N,		
	147, 148)		MLRA 136	•			3, ,	
	leyed Matrix (S4)		Umbric Surfa					icators of hydrophytic vegetation and
	edox (S5)		Piedmont Flo					etland hydrology must be present,
	Matrix (S6)		Red Parent M	laterial (F	21) (MLR	A 127, 147) un	less disturbed or problematic.
	ayer (if observed):							
Туре:								
Depth (inc	ches):						Hydric Soil	Present? Yes <u>√</u> No
Remarks:							•	

Wetland ID W-KP10 Cowardin Code PEM Date 11/12/2019



Photograph Number 73
Photograph Direction SW

Comments:



Photograph Number 74

Photograph Direction SE

Comments:



Photograph Number 75

Photograph Direction NNE

Comments:



Photograph Number 76

Photograph Direction NNW



Project/Site: Long Ridge Energy Terr	ninal Project	City/Count	_{v:} Monroe		Sampling Date: 11/12/2019
Applicant/Owner: Long Ridge Energy	Terminal, LLC			State: OH	Sampling Point: W-KP10-UPL
Investigator(s): JM, KP		Section, To	ownship, Range: N		
Landform (hillslope, terrace, etc.): Hillslop					Slope (%): 5-7
Subregion (LRR or MLRA): LRRN					Datum: NAD 83
Soil Map Unit Name: Made land					cation: None
Are climatic / hydrologic conditions on the s	ite typical for this tim	e of year? Yes			
Are Vegetation, Soil, or Hyd					present? Yes No
Are Vegetation, Soil, or Hyd				explain any answe	
SUMMARY OF FINDINGS – Attac	ch site map sho	wing sampiir	ig point location	ons, transects	s, important features, etc.
Hydrophytic Vegetation Present?	Yes No	✓ ls t	ne Sampled Area		
Hydric Soil Present?	Yes No	./	nin a Wetland?	Yes	No ✓
	Yes No	<u> </u>			
Remarks: Cowardin Code: UPLA	ND HGM:		Water Type:		
HYDROLOGY					
Wetland Hydrology Indicators:					ators (minimum of two required)
Primary Indicators (minimum of one is req				Surface Soil	` '
Surface Water (A1)		uatic Plants (B14)			getated Concave Surface (B8)
High Water Table (A2)		n Sulfide Odor (C		Drainage Pa	
Saturation (A3)				Moss Trim L	
Water Marks (B1)		e of Reduced Iron			Water Table (C2)
Sediment Deposits (B2)		ron Reduction in T	illed Solls (Co)	Crayfish Bur	isible on Aerial Imagery (C9)
Drift Deposits (B3) Algal Mat or Crust (B4)		ck Surface (C7) xplain in Remarks	.)		itressed Plants (D1)
Iron Deposits (B5)	Outer (E	Apiaiii iii iteiriarie	')	· 	Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu	
Water-Stained Leaves (B9)	,				aphic Relief (D4)
Aquatic Fauna (B13)				FAC-Neutra	` '
Field Observations:					
Surface Water Present? Yes	No <u>√</u> Depth (inches):	_		
Water Table Present? Yes	No <u>√</u> Depth (inches):	_		
Saturation Present? Yes	No <u>√</u> Depth (inches):	_ Wetland F	Hydrology Prese	nt? Yes No✓
(includes capillary fringe) Describe Recorded Data (stream gauge, r				ilable:	
Describe Necorded Data (stream gauge, i	nonitoring wen, aena	ii priotos, previous	ilispections), il ava	illable.	
Remarks:					

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-KP10-UPL

30'	Absolute	Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size:) 1	% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC:0 (A)
2				Total Number of Dominant
3				Species Across All Strata: 2 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:0 (A/B)
6				Bravelanes Index weather to
7				Prevalence Index worksheet:
		= Total Cov	_	
50% of total cover: 0	20% of	total cover	:0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30'				FACW species x 2 =
1				FAC species x 3 =
2			·	FACU species x 4 =
3				UPL species x 5 =
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 ¹
	0	= Total Cov	/er	4 - Morphological Adaptations ¹ (Provide supporting
50% of total cover: 0	20% of	total cover	:0	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 30')				Problematic Hydrophytic Vegetation¹ (Explain)
1. Microstegium vimineum	20		FAC	Problematic Hydrophytic vegetation (Explain)
2. Poa pratensis	40		FACU_	The diseases of headring and resident developed and resident
3. Trifolium pratense	25		FACU_	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. Plantago lanceolata	15		FACU_	Definitions of Four Vegetation Strata:
5				John Mone of Four Pogotation Gradua
6				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7				more in diameter at breast height (DBH), regardless of height.
8				
9.				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
10.				m) tall.
11.				Herb – All herbaceous (non-woody) plants, regardless
	100	= Total Cov	/er	of size, and woody plants less than 3.28 ft tall.
50% of total cover:50		total cover	~~	
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than 3.28 ft in height.
1				noight.
2				
3				
4				Hadaaa ka da
5.				Hydrophytic Vegetation
	0	= Total Cov	er	Present? Yes No _✓
50% of total cover:0	20% of	total cover	0	
Remarks: (Include photo numbers here or on a separate s	heet.)			
mowed industrial plant lawn				

Depth	Matrix	o the depth i	needed to document the indicator or co Redox Features	min the abov	circo oi maicati	510.)	
(inches)	Color (moist)	%	Color (moist) % Type ¹ Lo	c ² Textu		Remarks	
0-3	10YR 4/2	_100		GRS	<u> </u>		
3-12	10YR 4/4	100		GRO	IL		
					 -		
1 _{Tymax} C=C			adused Metrix MC-Mesked Cond Crains	21 apptio	n. Di =Dara Lia	ing M-Matrix	
Hydric Soil		etion, Rivi=Re	educed Matrix, MS=Masked Sand Grains.		n: PL=Pore Lin	וחק, ואו=ואומנדוג. roblematic Hydr	ic Soile ³ :
_			Dark Surface (S7)	•		_	
Histosol	oipedon (A2)	•	Dark Surface (S7) Polyvalue Below Surface (S8) (MLRA	147 149)		A10) (MLRA 147) e Redox (A16))
Histic Ep Black Hi		•	Thin Dark Surface (S9) (MLRA 147, 1		Coast Praint	, ,	
	n Sulfide (A4)	•	Loamy Gleyed Matrix (F2)	40)		podplain Soils (F1	19)
	l Layers (A5)	•	Depleted Matrix (F3)	_	(MLRA 13		.0)
	ick (A10) (LRR N)	•	Redox Dark Surface (F6)			v Dark Surface (T	F12)
	d Below Dark Surface	e (A11)	Depleted Dark Surface (F7)	_		in in Remarks) `	,
Thick Da	ark Surface (A12)		Redox Depressions (F8)				
Sandy M	lucky Mineral (S1) (L	RR N,	Iron-Manganese Masses (F12) (LRR	N,			
	A 147, 148)		MLRA 136)				
	Sleyed Matrix (S4)	•	Umbric Surface (F13) (MLRA 136, 12			ydrophytic vegeta	
	ledox (S5)		Piedmont Floodplain Soils (F19) (MLF			logy must be pre	
	Matrix (S6)	•	Red Parent Material (F21) (MLRA 127	7, 147)	unless disturb	ed or problemation	D.
Restrictive I	_ayer (if observed): ourse fragments						
			_				,
Depth (inc	ches): <u>12</u> +		_	Hydric	Soil Present?	Yes	No <u> </u>
Remarks:							

Project/Site: Long Ridge Energy Terminal, LLC	City/Count	_{v:} Monroe		Sampling Date: 11/12/2019		
Applicant/Owner: Long Ridge Energy Terminal, L	LC	,		Sampling Point: W-KP11		
Investigator(s): JM, KP	Section, To	ownship, Range: N/A	4			
Landform (hillslope, terrace, etc.): Hillslope	Local relief (co	oncave, convex, non	_{e):} Linear	Slope (%): 5-7		
Subregion (LRR or MLRA): LRRN Lat: 3	9.707693	Long80.8	850430	Datum: NAD 83		
Soil Map Unit Name: Sees-Woolper silt loams, 18	to 35 percent slope					
Are climatic / hydrologic conditions on the site typical for t						
Are Vegetation, Soil, or Hydrology	-			present? Yes No		
Are Vegetation, Soil, or Hydrology			xplain any answe			
SUMMARY OF FINDINGS – Attach site map		•		,		
		<u> </u>	.,	.,		
	No Is t	he Sampled Area				
		hin a Wetland?	Yes <u>√</u>	No		
Demorks	No					
Cowardin Code: PEM H	GM: Slope	Water Type: F	RPWWD			
HYDROLOGY						
Wetland Hydrology Indicators:		<u> </u>	Secondary Indica	ators (minimum of two required)		
Primary Indicators (minimum of one is required; check a	ll that apply)		Surface Soil Cracks (B6)			
Surface Water (A1) Tr	rue Aquatic Plants (B14)	_		getated Concave Surface (B8)		
	ydrogen Sulfide Odor (C		✓ Drainage Pa			
1 - · · · · - · · · · · · · · · · · · · ·	xidized Rhizospheres on		Moss Trim L			
Water Marks (B1)	resence of Reduced Iron	(C4)	Dry-Season	Water Table (C2)		
	ecent Iron Reduction in	Γilled Soils (C6)	Crayfish Bu	rrows (C8)		
Drift Deposits (B3) Th	nin Muck Surface (C7)	<u>-</u>	Saturation V	isible on Aerial Imagery (C9)		
Algal Mat or Crust (B4) Of	ther (Explain in Remarks	s) _	Stunted or S	Stressed Plants (D1)		
Iron Deposits (B5)		-	✓ Geomorphic	Position (D2)		
Inundation Visible on Aerial Imagery (B7)		-	Shallow Aqւ	uitard (D3)		
Water-Stained Leaves (B9)	-	Microtopographic Relief (D4)				
Aquatic Fauna (B13)		-	✓ FAC-Neutra	I Test (D5)		
Field Observations:						
Surface Water Present? Yes No D	Depth (inches):	_				
Water Table Present? Yes No C				,		
Saturation Present? Yes No C	Depth (inches):	_ Wetland H	ydrology Prese	nt? Yes No		
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring wel	l, aerial photos, previous	inspections), if avail	lable:			
, , , ,						
Remarks:						

VE

20'	Absolute	Dominant	Indicator	Dominance Test worksheet:
ree Stratum (Plot size: 30')	% Cover	Species?	Status	Number of Dominant Species
				That Are OBL, FACW, or FAC:5 (A)
-				Total Number of Dominant
		. <u></u>		Species Across All Strata: 5 (B)
				Dergant of Deminant Species
i				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
i				
				Prevalence Index worksheet:
	0 :	= Total Cov	/er	Total % Cover of: Multiply by:
50% of total cover:	0 20% of	total cover	:0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 30')				FACW species x 2 =
·				FAC species x 3 =
2				FACU species x 4 =
3				UPL species x 5 =
				Column Totals: (A) (B)
i				
)				Prevalence Index = B/A =
·		-		Hydrophytic Vegetation Indicators:
 				✓ 1 - Rapid Test for Hydrophytic Vegetation
			-	✓ 2 - Dominance Test is >50%
)		= Total Cov	- ———	3 - Prevalence Index is ≤3.0 ¹
50% of total cover:		total cover	_	4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 30')	2070 01	total bovel	•	data in Remarks or on a separate sheet)
Phalaris arundinacea	5		FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
Bidens frondosa			FACW	
Dipsacus fullonum			FACU	¹ Indicators of hydric soil and wetland hydrology must
Microstegium vimineum			FAC	be present, unless disturbed or problematic.
Echinochloa muricata			FACW	Definitions of Four Vegetation Strata:
5. Poa trivialis	 5		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
Scirpus atrovirens	 		OBL	more in diameter at breast height (DBH), regardless of
Juncus effusus			FACW	height.
3. Junicus enusus			FACW	Sapling/Shrub – Woody plants, excluding vines, less
Calidaga gigantaa				
	10			than 3 in. DBH and greater than or equal to 3.28 ft (1
0. Juncus tenuis	10		FAC	than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
_{0.} Juncus tenuis	10			m) tall.
10. Juncus tenuis 1. Carex frankii	10 15 120	= Total Cov	FAC OBL ver	m) tall.
10. Juncus tenuis 11. Carex frankii 50% of total cover:	10 15 120	= Total Cover	FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10. Juncus tenuis 11. Carex frankii 50% of total cover:	10 15 120		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless
O. Juncus tenuis 1. Carex frankii 50% of total cover: Voody Vine Stratum (Plot size:15')	10 15 120		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in
Juncus tenuis 1. Carex frankii 50% of total cover: Noody Vine Stratum (Plot size:15')	10 15 120 20% of		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in
Jo. Juncus tenuis 10. Juncus tenuis 50% of total cover: Noody Vine Stratum (Plot size: 15')	10 15 120 20% of		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in
Juncus tenuis 1. Carex frankii 50% of total cover: Woody Vine Stratum (Plot size:15')	10 15 120 20% of		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
Juncus tenuis 10. Juncus tenuis 50% of total cover:	10 15 120 20% of		FAC OBL ver	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation
Noody Vine Stratum (Plot size: 15')	10 15 120 60 20% of		FAC OBL ver : 24	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic
Juncus tenuis 1. Carex frankii 50% of total cover:	10 15 120 60 20% of	total cover	FAC OBL ver 24	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation
O. Juncus tenuis 1. Carex frankii 50% of total cover: Voody Vine Stratum (Plot size:15') 2 3 5 6	10 15 120 20% of	= Total Cov	FAC OBL ver 24	m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation

Sampling Point: W-KP11

Depth	Matrix (Matrix	0/		x Features	T 1	1 . 2	T 4	D		
(inches) 0-5	Color (moist) 7.5YR 4/2	<u>%</u> 95	Color (moist) 7.5YR 4/6	<u>%</u> 5	Type ¹	Loc² M/PL	Texture GRCL	Remarks		
					<u>C</u>					
<u>5-16</u>	7.5YR 5/2	90_	7.5YR 4/6	10_	<u>C</u>	_ <u>M</u>	GRCL			
						<u> </u>				
										
ype: C=C	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked \$	Sand Gr	ains.	² Location: PL=	Pore Lining, M=Matrix.		
ydric Soil	Indicators:						Indicate	ors for Problematic Hydric Soils ³ :		
_ Histosol	(A1)		Dark Surface	(S7)			2 cı	m Muck (A10) (MLRA 147)		
_ Histic E _l	oipedon (A2)		Polyvalue Be	low Surface	e (S8) (I	MLRA 147,	148) Coa	ast Prairie Redox (A16)		
_ Black H	istic (A3)		Thin Dark Su	. ,	•	147, 148)		MLRA 147, 148)		
	en Sulfide (A4)		Loamy Gleye		2)			dmont Floodplain Soils (F19)		
	d Layers (A5)		✓ Depleted Mar					MLRA 136, 147)		
	uck (A10) (LRR N)	(8.4.4)	Redox Dark	•	,			ry Shallow Dark Surface (TF12)		
_	d Below Dark Surface	e (A11)	Depleted Dar				Oth	ner (Explain in Remarks)		
	ark Surface (A12) ⁄lucky Mineral (S1) (L	DD N	Redox Depressions (F8) Iron-Manganese Masses (F12) (LRR N,							
	A 147, 148)	KK N,	MLRA 13		5 (F 12)	LKK N,				
	Gleyed Matrix (S4)		Umbric Surfa	•	/II RA 1:	36 122)	³ Indic:	ators of hydrophytic vegetation and		
	Redox (S5)		Piedmont Flo					and hydrology must be present,		
	I Matrix (S6)		Red Parent N					ss disturbed or problematic.		
	Layer (if observed):		_ 	,		•	, [·		
Туре:										
Depth (in	ches).						Hydric Soil P	resent? Yes <u>√</u> No		
emarks:							,			
Ciliaiks.										

Wetland ID W-KP11 Cowardin Code PEM Date 11/12/2019



Comments:



Photograph Number 78
Photograph Direction SSW

Comments:

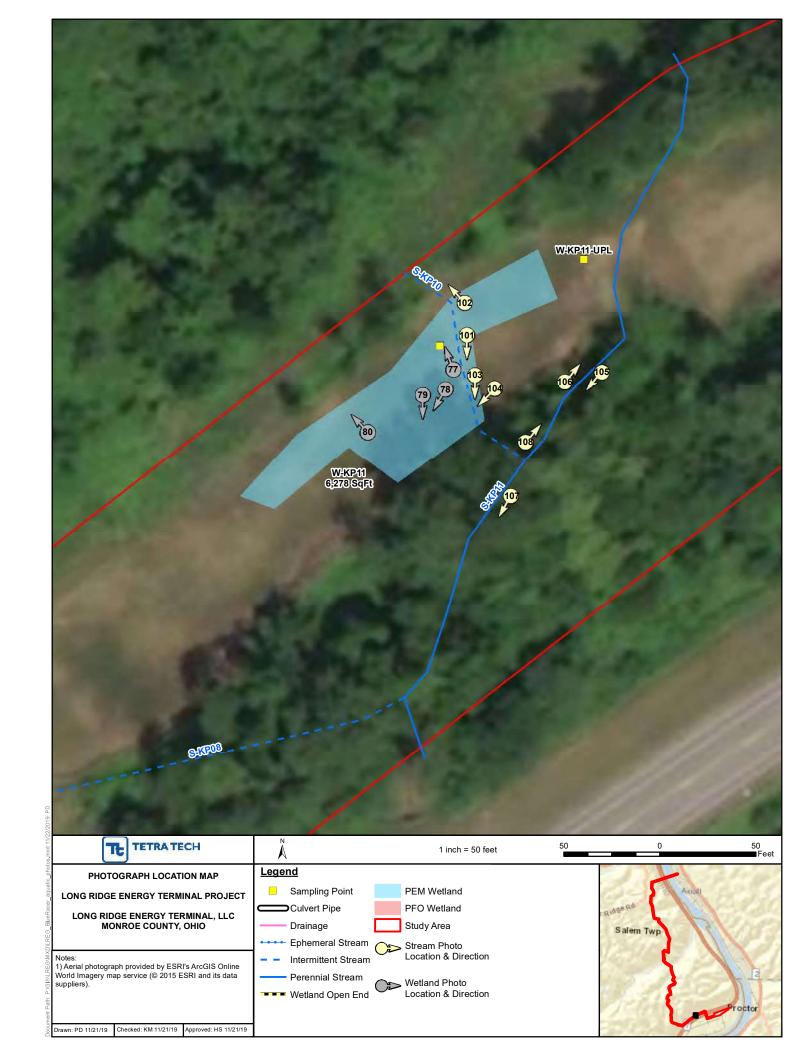


Photograph Number 79
Photograph Direction South

Comments:



Photograph Number 80
Photograph Direction NW



Project/Site: Long Ridge Ener	rgy Terminal Pro	ject _C	ity/County: Monroe		_ Sampling Date: 11/11/19			
Applicant/Owner: Long Ridge	Energy Terminal	, LLC			Sampling Point: W-KP11-UPL			
Investigator(s): JM, KP			ection, Township, Rang		<u> </u>			
Landform (hillslope, terrace, etc.):	Hillslope				Slope (%): 3-5			
Subregion (LRR or MLRA): LRR					Datum: NAD 83			
Soil Map Unit Name: Sees-Woo								
Are climatic / hydrologic conditions								
Are Vegetation, Soil					present? Yes No			
Are Vegetation, Soil		-		ded, explain any answ				
-					,			
SUMMARY OF FINDINGS	- Attach site m	nap snowing s	sampling point loc	cations, transect	s, important features, etc.			
Hydrophytic Vegetation Present?	? Yes	No √	Is the Sampled A	\rea				
Hydric Soil Present?	Yes	No	within a Wetland		No			
Wetland Hydrology Present?	Yes	No √						
Remarks: Cowardin Code	e: UPLAND	HGM:	Water Ty	/pe:				
HYDROLOGY								
Wetland Hydrology Indicators:	:			Secondary Indi	cators (minimum of two required)			
Primary Indicators (minimum of o	one is required; chec	k all that apply)		Surface So	il Cracks (B6)			
Surface Water (A1)		True Aquatic Pla	nts (B14)	Sparsely V	egetated Concave Surface (B8)			
High Water Table (A2)		Hydrogen Sulfide	Odor (C1)	Drainage P	Drainage Patterns (B10)			
Saturation (A3)		Oxidized Rhizosp	pheres on Living Roots (
Water Marks (B1)		Presence of Red			n Water Table (C2)			
Sediment Deposits (B2)			uction in Tilled Soils (C6					
Drift Deposits (B3)		Thin Muck Surface			Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)		Other (Explain in	Remarks)	· · · · · · · · · · · · · · · · · · ·	Stressed Plants (D1)			
Iron Deposits (B5)	Imagony (R7)			Geomorphi Shallow Aq	c Position (D2)			
Inundation Visible on Aerial Water-Stained Leaves (B9)	illiagery (b7)				raphic Relief (D4)			
Aquatic Fauna (B13)				FAC-Neutr				
Field Observations:								
	/es No _ √	Depth (inches):						
	/es No _√							
	/es No <u>√</u>			and Hvdrology Prese	ent? Yes No_ ✓			
(includes capillary fringe)								
Describe Recorded Data (stream	r gauge, monitoring v	weii, aeriai priotos,	, previous inspections),	ii avallable.				
Remarks:								
1								

Sampling Point:	W-KP11-UP	L
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Tree Stratum (Plot size: 30'	Absolute	Dominant		Dominance Test worksheet:		
Tiec ottatam (Flot Size)	% Cover	Species?	<u>Status</u>	Number of Dominant Species	0	
1				That Are OBL, FACW, or FAC:	0	(A)
2				Total Number of Dominant	_	
3				Species Across All Strata:	2	(B)
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	0	(A/B)
6						, ,
7				Prevalence Index worksheet:		
	0 :	= Total Cov	er er	Total % Cover of:	Multiply by:	
50% of total cover:0			_	OBL species x 1	ı =	_
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2	2 =	_
1				FAC species x 3	3 =	_
2				FACU species x 4	t =	_
3				UPL species x 5		II.
				Column Totals: (A)		
4				, ,		_ ` '
5				Prevalence Index = B/A =		_
6				Hydrophytic Vegetation Indicat	ors:	
7				1 - Rapid Test for Hydrophyti	c Vegetation	
8				2 - Dominance Test is >50%		
9				3 - Prevalence Index is ≤3.0 ¹		
		= Total Cov		4 - Morphological Adaptations		porting
50% of total cover: 0	20% of	total cover	:0	data in Remarks or on a s		
Herb Stratum (Plot size: 5')	40		E 4 O 14 /	Problematic Hydrophytic Veg		
1. Bidens frondsa	10		FACW	Froblematic Hydrophytic veg	etation (Expla	"")
2. Trifolium repens	35		FACU	11	and bridgets are	
3. Phleum pratense	15		FACU_	¹ Indicators of hydric soil and wetla be present, unless disturbed or pr		must
4. Dactylis glomerata	5		FACU	Definitions of Four Vegetation S		
5. Microstegium vimineum	5		FAC	Deminions of Four Vegetation (Juata.	
6. Solidago canadensis	30	√	FACU	Tree – Woody plants, excluding v		
7		-		more in diameter at breast height height.	(DBH), regard	less of
8				neight.		
				Sapling/Shrub – Woody plants, e		
9		-		than 3 in. DBH and greater than c m) tall.	or equal to 3.28	3 ft (1
10				m) tan.		
11	100			Herb – All herbaceous (non-wood		rdless
50% of total cover 50		= Total Cov		of size, and woody plants less that	ın 3.28 Tt taii.	
0070 01 10141 00 1011	20% 01	total cover		Woody vine – All woody vines gr	eater than 3.28	3 ft in
Woody Vine Stratum (Plot size: 15')				height.		
1						
2		-				
3						
4				Hydrophytic		
5				Vegetation		
	0 :	= Total Cov	er _	Present? Yes	No <u>√</u>	
50% of total cover:0	20% of	total cover	:0			
Remarks: (Include photo numbers here or on a separate s	heet.)			-		

	•	o the depth i	needed to document the indicator or conf	irm the abs	sence or indicat	ors.)	
Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist) % Type ¹ Loc ²	 Textu	ıre	Remarks	
0-7	10YR 4/2	100		GR			
7-12	10YR 4/4	100		GR	CI		
	101111111				<u> </u>		
				_			
¹ Type: C=Co	oncentration, D=Depl	etion, RM=Re	educed Matrix, MS=Masked Sand Grains.	² Locati	on: PL=Pore Lin	ing, M=Matrix.	
Hydric Soil I	ndicators:				Indicators for P	roblematic Hydric	Soils ³ :
Histosol	(A1)		Dark Surface (S7)		2 cm Muck	(A10) (MLRA 147)	
Histic Ep	ipedon (A2)	-	Polyvalue Below Surface (S8) (MLRA 1	47, 148)	Coast Prairi	e Redox (A16)	
Black His		-	Thin Dark Surface (S9) (MLRA 147, 148	3)	(MLRA 1		
	n Sulfide (A4)		Loamy Gleyed Matrix (F2)			oodplain Soils (F19)
	Layers (A5)	-	Depleted Matrix (F3)		(MLRA 1		40\
	ck (A10) (LRR N) I Below Dark Surface	. /A11)	Redox Dark Surface (F6) Depleted Dark Surface (F7)			w Dark Surface (TF ain in Remarks)	12)
	rk Surface (A12)	; (A11) _	Redox Depressions (F8)		Other (Expir	alli ili Nelliaiks)	
	lucky Mineral (S1) (L	RR N.	Iron-Manganese Masses (F12) (LRR N,				
	\ 147, 148)	, -	MLRA 136)				
	leyed Matrix (S4)	(-	Umbric Surface (F13) (MLRA 136, 122)		³ Indicators of h	nydrophytic vegetati	on and
	edox (S5)	-	Piedmont Floodplain Soils (F19) (MLRA			ology must be prese	ent,
	Matrix (S6)	-	Red Parent Material (F21) (MLRA 127,	147)	unless disturb	oed or problematic.	
Restrictive L	ayer (if observed):						
	ourse fragments		_				,
Depth (inc	ches): <u>12</u> +		_	Hydri	c Soil Present?	Yes N	o <u> </u>
Remarks:				<u>-</u>			

Project/Site: Long Ridge Energy Terminal F	Project City/C	_{ounty:} Monroe		Sampling Date: 11/12/2019
Applicant/Owner: Long Ridge Energy Termi	nal, LLC			Sampling Point: W-KP12
	Section			
Landform (hillslope, terrace, etc.): Hillslope				Slope (%): 3-5
Subregion (LRR or MLRA): LRRN				Datum: NAD 83
Soil Map Unit Name: Sees-Woolper silt loam				
Are climatic / hydrologic conditions on the site typic	al for this time of year? Y	es No	(If no, explain in F	Remarks.)
Are Vegetation, Soil, or Hydrology	significantly disturl	oed? Are "Normal	l Circumstances"	present? Yes 🗸 No
Are Vegetation, Soil, or Hydrology _	naturally problema		explain any answe	
SUMMARY OF FINDINGS - Attach site	e map showing sam	pling point location	ons, transects	s, important features, etc.
	1			<u>: </u>
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes		Is the Sampled Area	,	
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	✓ No ✓ No	within a Wetland?	Yes <u> </u> ✓	No
Remarks: Cowardin Code: PEM	HGM: Slope	Water Type:	DDVANAAL	
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; c	heck all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)	Hydrogen Sulfide Odd		✓ Drainage Pa	atterns (B10)
Saturation (A3)	✓ Oxidized Rhizosphere	es on Living Roots (C3)	Moss Trim L	ines (B16)
Water Marks (B1)	Presence of Reduced	I Iron (C4)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reductio	n in Tilled Soils (C6)	Crayfish Bur	
Drift Deposits (B3)	Thin Muck Surface (C			isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Other (Explain in Ren	narks)		Stressed Plants (D1)
Iron Deposits (B5)			✓ Geomorphic	
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu	
Water-Stained Leaves (B9)				aphic Relief (D4)
Aquatic Fauna (B13)			✓ FAC-Neutra	l Test (D5)
Field Observations:	Double (in the ca)			
Surface Water Present? Yes No	Depth (inches): Depth (inches):			
	Depth (inches):	I	hadaala sa Baasa	V / N.
Saturation Present? Yes No (includes capillary fringe)	V Depth (inches):	Wetland F	Hydrology Presei	nt? Yes <u>√</u> No
Describe Recorded Data (stream gauge, monitori	ng well, aerial photos, pre	vious inspections), if ava	ilable:	
Remarks:				
Remarks.				

VEGETATION (Four Strata) – Use scientific names of plants.

Sapling/Shrub Stratum (Plot size: 30')

Tree Stratum (Plot size: __

Herb Stratum (Plot size: __

Phalaris arundinacea
 Bidens frondosa

4 Microstegium vimineum

5. Echinochloa muricata

3. Typha angustifolia

7 Scirpus atrovirens

8. Juncus effusus

9. Carex frankii

6. Poa trivialis

____)

50% of total cover: __ 0

% Cover Species? Status

= Total Cover

0 = Total Cover

5

5

15

5

20

20

15

50% of total cover: 55 20% of total cover: 22

50% of total cover: 0 20% of total cover: 0

110 = Total Cover

0 = Total Cover

20% of total cover: 0

FACW

FACW

OBL

FAC

OBL

OBL

FACW

FACW FACW

50% of total cover: 0 20% of total cover: 0

		1	A/ I/D40	
	Sampling Poi	int:_	W-KP12	
	Dominance Test worksheet:			
_	Number of Dominant Species That Are OBL, FACW, or FAC:		3	_ (A)
-	Total Number of Dominant Species Across All Strata:	_ (B)		
-	Percent of Dominant Species That Are OBL, FACW, or FAC:		100	_ (A/B)
-	Prevalence Index worksheet:			
-	Total % Cover of:	N/I	ultiply by:	
-				
	FACW species x			
_				
	FACU species x	4 = _		_
	UPL species x	5 = .		
	Column Totals: (A)		(B)
-	Prevalence Index = B/A =			_
-	Hydrophytic Vegetation Indica			
-	✓ 1 - Rapid Test for Hydrophyt		egetation	
-	✓ 2 - Dominance Test is >50%)		
-	3 - Prevalence Index is ≤3.0	1		
	4 - Morphological Adaptation	ns¹ (F	Provide su	pporting
-	data in Remarks or on a s	sepa	rate sheet)
	Problematic Hydrophytic Veg			
-		0	` '	,
-	¹ Indicators of hydric soil and wetl be present, unless disturbed or p	land proble	hydrology ematic.	must
-	Definitions of Four Vegetation	Stra	ta:	
-			0: (7.6	
_	Tree – Woody plants, excluding more in diameter at breast height			
-	height.	(()	orij, rogare	1000 01
	Sapling/Shrub – Woody plants, than 3 in. DBH and greater than		•	
	m) tall.	01 00	1441 to 0.2	011(1
-	,			
-	Herb – All herbaceous (non-woo of size, and woody plants less th			ardless
-	Woody vine – All woody vines g height.	reate	er than 3.2	8 ft in
-				
-				
_				
	Uvdranhytia			
_	Hydrophytic Vegetation			
	Present? Yes <u>√</u>	N	°	
_				

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

Woody Vine Stratum (Plot size: 15')

Depth	Matrix	%		x Features	ype ¹ Loc ²	Taxtura		Domorko	
inches)	Color (moist)		Color (moist)			Texture SICL		Remarks	
0-2	10YR 4/1	95_	10YR 4/6						
2-9	10YR 5/2	90_	10YR 4/6	<u>10</u> (<u> M/PL</u>	GRCL_			
-							-		
pe: C=C	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked Sa	and Grains.	² Location: PI	 _=Pore Lini	ng, M=Matrix.	
	Indicators:	,	,					oblematic Hy	dric Soils ³
Histosol	(A1)		Dark Surface	e (S7)		2	cm Muck (A10) (MLRA 1 4	47)
	pipedon (A2)				(S8) (MLRA 147	, 148) C	oast Prairie	Redox (A16)	
	istic (A3)			, , ,	ILRA 147, 148)	_	(MLRA 14		
	en Sulfide (A4)		Loamy Gleye			P		oodplain Soils ((F19)
_	d Layers (A5) uck (A10) (LRR N)		Depleted Ma Redox Dark			V	(MLRA 13 ery Shallow	o , 147) / Dark Surface	(TF12)
	d Below Dark Surface	(A11)	Depleted Dai		7)			in in Remarks)	
-	ark Surface (A12)	()	Redox Depre		,		(,	
	/ucky Mineral (S1) (L	RR N,			(F12) (LRR N,				
	A 147, 148)		MLRA 13	•		•			
-	Gleyed Matrix (S4)				.RA 136, 122)			ydrophytic veg	
-	Redox (S5)				(F19) (MLRA 1		-	logy must be p	
	l Matrix (S6) Layer (if observed):		Red Parent i	viateriai (FZ1)	(MLRA 127, 14	(7) uni	ess disturb	ed or problema	auc.
	ourse fragments								
, <u> </u>			<u></u>			Hydric Soil	Drocont?	Yes ✓	No
Denth (in	ches): 9+					Tiyane don	1 1030111:	163	
	ches): 9+								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
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	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
Depth (in	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								
	ches): <u>9+</u>								

Wetland ID W-KP12 Cowardin Code PEM Date 11/12/2019



Photograph Number 81
Photograph Direction SE

Comments:



Photograph Number 82
Photograph Direction South

Comments:



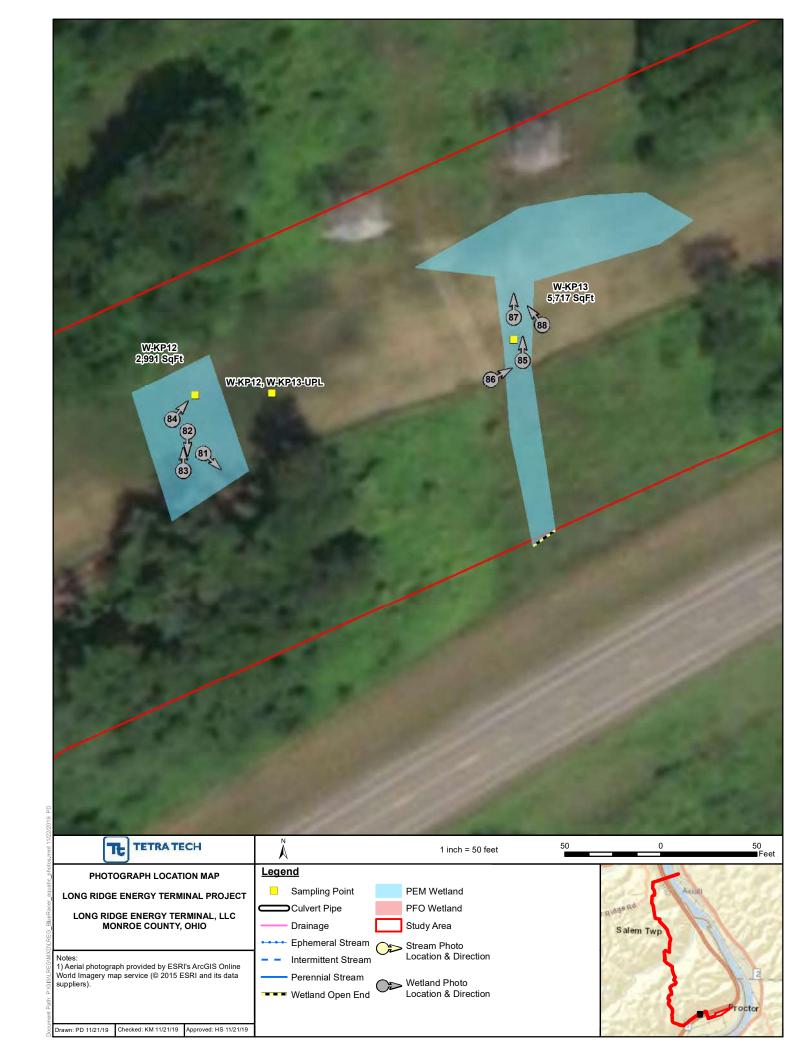
Photograph Number 83
Photograph Direction North

Comments:



Photograph Number 84

Photograph Direction NE



Project/Site: Long Ridge Energy Termina	I Project City/0	County: Monroe		Sampling Date: 11/12/2019			
Applicant/Owner: Long Ridge Energy Terr	minal, LLC		_ _{State:} OH	Sampling Point: W-KP12,W-KP13-UPL			
Investigator(s): JM, KP	Secti	on, Township, Range: N					
Landform (hillslope, terrace, etc.): Hillslope	Local re	lief (concave, convex, no	_{ne):} Convex	Slope (%):_4-8			
Subregion (LRR or MLRA): LRRN		Long: <u>-</u> 80		Datum: NAD 83			
Soil Map Unit Name: Sees-Woolper silt loa							
Are climatic / hydrologic conditions on the site type			<u>-</u>	<u> </u>			
, ,	•		•				
Are Vegetation, Soil, or Hydrolog				present? Yes No			
Are Vegetation, Soil, or Hydrolog		,	explain any answe	•			
SUMMARY OF FINDINGS – Attach s	ite map snowing san	npling point location	ons, transects	s, important features, etc.			
	No √	Is the Sampled Area					
	No <u>√</u>	within a Wetland?	Yes	No <u>√</u>			
	No √						
Remarks: Cowardin Code: UPLAND	HGM:	Water Type:					
HYDROLOGY							
Wetland Hydrology Indicators:				ators (minimum of two required)			
Primary Indicators (minimum of one is required			Surface Soil	• •			
Surface Water (A1)	True Aquatic Plants		Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)				
High Water Table (A2)	Hydrogen Sulfide Oc		_				
Saturation (A3)		res on Living Roots (C3)					
Water Marks (B1)Sediment Deposits (B2)	Presence of Reduce	on in Tilled Soils (C6)	Dry-Season Crayfish Bur	Water Table (C2)			
Sediment Deposits (B2) Drift Deposits (B3)	Thin Muck Surface (-	isible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Other (Explain in Re			Stressed Plants (D1)			
Iron Deposits (B5)		,	Geomorphic				
Inundation Visible on Aerial Imagery (B7)			Shallow Aqu				
Water-Stained Leaves (B9)				aphic Relief (D4)			
Aquatic Fauna (B13)			FAC-Neutra	l Test (D5)			
Field Observations:							
	Depth (inches):						
	Depth (inches):	• • • • • • • • • • • • • • • • • • •					
	Depth (inches):	Wetland H	Hydrology Presei	nt? Yes No✓			
(includes capillary fringe) Describe Recorded Data (stream gauge, monit	oring well aerial photos pre	evious inspections) if ava	ailable:				
Describe Resoluted Bata (stream gauge, mema	oring won, donar priotos, pre	, in ava	masic.				
Remarks:							

0.01	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				
3				Total Number of Dominant Species Across All Strata: 3 (B)
4				Species Across All Strata:3 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:0% (A/B)
6				Prevalence Index worksheet:
7				
		= Total Cov		Total % Cover of: Multiply by:
50% of total cover:0	20% of	total cover	. 0	OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species x 2 =
1				FAC species x 3 =
2				FACU species x 4 =
3.				UPL species x 5 =
				Column Totals: (A) (B)
4		-		(2)
5		-		Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				
9.				2 - Dominance Test is >50%
	0	= Total Cov	er	3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0		total cover	_	4 - Morphological Adaptations (Provide supporting
Herb Stratum (Plot size: 5')	20 /0 01	10101 00101		data in Remarks or on a separate sheet)
1. Symphyotrichum ericoides	10		FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Solidago canadensis			FACU	¹ Indicators of hydric soil and wetland hydrology must
3. Trifolium repens	30		FACU_	be present, unless disturbed or problematic.
4. Phleum pratense	5		FACU_	Definitions of Four Vegetation Strata:
{5.} Dactylis glomerata	20		FACU	
6. Daucus carota	5		UPL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Rosa multiflora	10		FACU	more in diameter at breast height (DBH), regardless of height.
				neight.
8				Sapling/Shrub – Woody plants, excluding vines, less
9				than 3 in. DBH and greater than or equal to 3.28 ft (1
10				m) tall.
11				Herb – All herbaceous (non-woody) plants, regardless
		= Total Cov		of size, and woody plants less than 3.28 ft tall.
50% of total cover: <u>50</u>	20% of	total cover	20	Mondy vine All woody vines greater than 2.29 ft in
Woody Vine Stratum (Plot size: 15')				Woody vine – All woody vines greater than 3.28 ft in height.
1.				
2.				
3				
4				Hydrophytic
5				Vegetation Present? Yes No _ ✓
•		= Total Cov	_	Present? Yes No _✓
50% of total cover:0	20% of	total cover	. 0	
Remarks: (Include photo numbers here or on a separate s	heet.)			

Sampling Point: W-KP12,W-KP13-UPL

Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the i	ndicator o	or confirm	the absen	ce of indica	tors.)		
Depth	Matrix		Redo	x Features	3	 			_		
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>		Remar	ks	
0-8	2.5Y 4/4	60					GRCL	<u> </u>			
	2.5Y 5/2	40							Disturb	ed soils	
					•						
	-										
					-						
¹Type: C=Co	oncentration, D=Depl	etion. RM=R	educed Matrix. MS	= S=Masked	Sand Gra	ins.	² Location:	PL=Pore Li	ning. M=Ma	trix.	
Hydric Soil I			<u> </u>					dicators for I			oils³:
Histosol			Dark Surface	(S7)					(A10) (MLR	-	
	pipedon (A2)		Polyvalue Be		ce (S8) (M	LRA 147,	148)		ie Redox (A		
Black His			Thin Dark Su				, <u> </u>		(47, 148)	,	
	n Sulfide (A4)		Loamy Gleye			,			loodplain S	oils (F19)	
	Layers (A5)		Depleted Ma		,				136, 147)	, ,	
2 cm Mu	ck (A10) (LRR N)		Redox Dark		6)				w Dark Sur	face (TF12)
Depleted	l Below Dark Surface	(A11)	Depleted Dar	k Surface	(F7)			Other (Exp	lain in Rema	ırks)	
Thick Da	ırk Surface (A12)		Redox Depre	ssions (F	3)						
Sandy M	lucky Mineral (S1) (L	RR N,	Iron-Mangan	ese Masse	es (F12) (L	LRR N,					
	147, 148)		MLRA 13	6)							
Sandy G	leyed Matrix (S4)		Umbric Surfa					Indicators of	hydrophytic	vegetation	and
Sandy R	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	8)	wetland hydi	rology must	be present	,
	Matrix (S6)		Red Parent N	laterial (F	21) (MLR /	A 127, 147	")	unless distur	bed or prob	lematic.	
	ayer (if observed):										
	ourse fragments		<u></u>								
Depth (inc	ches): <u>8+</u>						Hydric S	oil Present?	Yes	No _	✓
Remarks:											

Project/Site: Long Ridge Energy Terminal Project City/County: Monroe	Sampling Date: 11/12/2019
	State: OH Sampling Point: W-KP13
Investigator(s): JM, KP Section, Township, Range: N	/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, no	
	.848796 Datum: NAD 83
Soil Map Unit Name: Gilpin-upshur complex, 18 to 35 percent slopes, moderately eroc	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No	
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Norma	
	explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point location	
	····, ·······, ···, ···, ···, ···, ···
Hydrophytic Vegetation Present? Yes No Is the Sampled Area	,
Hydric Soil Present? Yes ✓ No within a Wetland? Wetland Hydrology Present? Yes ✓ No	Yes No
, o,	DD140444
Remarks: Cowardin Code: PEM HGM: Slope Water Type:	RPWWN
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
✓ Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
✓ High Water Table (A2) — Hydrogen Sulfide Odor (C1) — Odd in the Park (A2) — Odd in the Park	✓ Drainage Patterns (B10)
✓ Saturation (A3) Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)
Water Marks (B1) Presence of Reduced Iron (C4) Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6)	Dry-Season Water Table (C2)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Drift Deposits (B3) Thin Muck Surface (C7)	Crayfish Burrows (C8)Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain in Remarks)	Saturation visible on Aerial imagely (C9) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches):0.5	
Water Table Present? Yes <u>✓</u> No Depth (inches): <u>0</u>	
	lydrology Present? Yes <u>√</u> No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available of the control of the	ilable:
Remarks:	

VEGETATION (Four Strata) - Use scientific names of plants.

0 = Total Cover

50% of total cover: 0 20% of total cover: 0

50% of total cover: 2.5 20% of total cover: 1

50% of total cover: 60 20% of total cover: 24

50% of total cover: 0 20% of total cover:

30'

Sapling/Shrub Stratum (Plot size: 30') 1. Salix nigra

Tree Stratum (Plot size: __

Herb Stratum (Plot size: ___ 1. Symphyotrichum ericoides

2. Bidens frondosa

6. Poa trivialis

3. Typha angustifolia

7 Scirpus atrovirens

10. Scirpus cyperinus

8. Juncus effusus

11. Carex frankii

4. Microstegium vimineum

9. Eupatorium perfoliatum

5. Echinochloa muricata

mes of	plants.		Sampling Poir	nt: W-KP13	
Absolute			Dominance Test worksheet:		
% Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC:	6	(A)
			Total Number of Dominant Species Across All Strata:	6	(B)
			Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)
			Prevalence Index worksheet:		
			Total % Cover of:	Multiply by:	
	= Total Cov	_		=	
20% 01	total cover:		· —	=	_
5	./	OBL		=	_
			· —	=	_
				=	
			Column Totals: (A)		_
			Column Totals (A)		(D)
			Prevalence Index = B/A = _		_
			Hydrophytic Vegetation Indicate	ors:	
			1 - Rapid Test for Hydrophytic	Vegetation	
			✓ 2 - Dominance Test is >50%		
			3 - Prevalence Index is ≤3.0 ¹		
	= Total Cover:	-4	4 - Morphological Adaptations	s¹ (Provide sup	porting
20 /0 01	total cover.	<u> </u>	data in Remarks or on a se	eparate sheet))
5		FACU	Problematic Hydrophytic Veg	etation¹ (Expla	in)
		FACW			
<u></u> 5		OBL	¹ Indicators of hydric soil and wetla	nd hydrology	must
 5		FAC	be present, unless disturbed or pre-		
		FACW	Definitions of Four Vegetation S	Strata:	
5		FACW	Tree – Woody plants, excluding vi	nes, 3 in. (7.6	cm) or
20		OBL	more in diameter at breast height	(DBH), regard	less of
20	<u> </u>	FACW	height.		
<u> </u>		FACW	Sapling/Shrub – Woody plants, e		
 5		OBL	than 3 in. DBH and greater than o m) tall.	r equal to 3.28	3 ft (1
 15		OBL	ini) taii.		
	▼ = Total Cov		Herb – All herbaceous (non-wood of size, and woody plants less tha		ardless
	total cover:		or orze, and woody plants less tha	., J.20 II Iaii.	
23 / 01	50,01.	-	Woody vine – All woody vines green height.	eater than 3.28	3 ft in
			Hydrophytic		
			Vegetation Present? Yes ✓	No	

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

Woody Vine Stratum (Plot size: 15')

Sampling Point: W-KP13

Depth	<u>Matrix</u>			x Features	- 1 .			5 .
(inches)	Color (moist)	<u>%</u>	Color (moist)				xture	Remarks
0-5	2.5Y 4/2	95	2.5Y 4/6		- -		<u>CL</u>	
5-12	2.5Y 5/2	55	2.5Y 4/6	5	<u>C </u>	<u>1 G</u>	RCL	
	2.5Y 5/4	40						
							_	
	-							
	oncentration, D=Dep	letion, RM=	Reduced Matrix, MS	S=Masked S	and Grains	. ² Loc	ation: PL=Pore L	
-	Indicators:			(0=)				Problematic Hydric Soils
_ Histosol			Dark Surface		(00) (84) 5	A 447 440V		k (A10) (MLRA 147)
	oipedon (A2)		Polyvalue Be					irie Redox (A16)
_ Black Hi	en Sulfide (A4)		Thin Dark Su Loamy Gleye			148)		147, 148) Floodplain Soils (F19)
	d Layers (A5)		✓ Depleted Ma		-)			136, 147)
	ick (A10) (LRR N)		Redox Dark					low Dark Surface (TF12)
	d Below Dark Surface	e (A11)	Depleted Da	, ,				plain in Remarks)
_	ark Surface (A12)	, ,	Redox Depre		,			,
_ Sandy M	lucky Mineral (S1) (L	.RR N,	Iron-Mangan	ese Masses	(F12) (LR	R N,		
	A 147, 148)		MLRA 13	•				
	Gleyed Matrix (S4)		Umbric Surfa					f hydrophytic vegetation and
	Redox (S5)		Piedmont Flo					drology must be present,
	Matrix (S6)		Red Parent N	Material (F21) (MLRA 1	27, 147)	unless disti	urbed or problematic.
	L <mark>ayer (if observed):</mark> ourse fragments							
· · · —								/
Depth (inc	ches): <u>9+</u>					Нус	Iric Soil Present	? Yes <u>√</u> No
emarks:								
lemarks:								
emarks:								
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Wetland ID W-KP13 Cowardin Code PEM Date 11/12/2019



Photograph Number <u>85</u>
Photograph Direction North

Comments:



Photograph Number 86
Photograph Direction ENE

Comments:



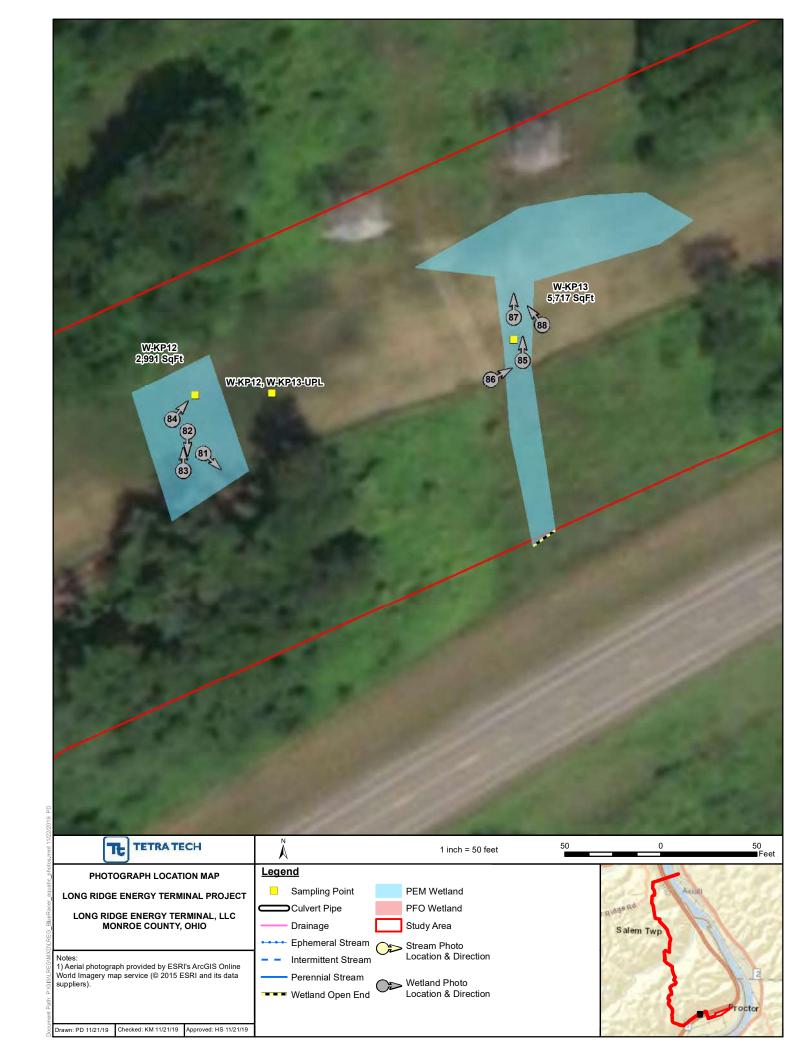
Photograph Number 87
Photograph Direction North

Comments:



Photograph Number 88

Photograph Direction NW



Project/Site: Long Ridge Energy Terminal Project	City/County: Monroe Sampling Date: 11/12/2019
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KP14
	Section, Township, Range: N/A
	ocal relief (concave, convex, none): Linear Slope (%): 6-10
Subregion (LRR or MLRA): LRRN Lat: 39.708465	
Soil Map Unit Name: Gilpin-upshur complex, 18 to 35 percer	
Are climatic / hydrologic conditions on the site typical for this time of y	
	y disturbed? Are "Normal Circumstances" present? Yes ✓ No
Are Vegetation, Soil, or Hydrology naturally pr	
	g sampling point locations, transects, important features, etc.
	9
Hydrophytic Vegetation Present? Yes <u>✓</u> No	Is the Sampled Area
Hydric Soil Present? Yes No No No No No No No No No N	within a Wetland? Yes No
Wetland Hydrology Present? Yes V No Remarks: Cowardin Codo DEM HCM: Slope	- DDMMD
Remarks: Cowardin Code: PEM HGM: Slop	e Water Type: RPWWD
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
✓ Surface Water (A1) True Aquatic F	Plants (B14) Sparsely Vegetated Concave Surface (B8)
✓ High Water Table (A2) — Hydrogen Sulf	
✓ Saturation (A3) Oxidized Rhiz	ospheres on Living Roots (C3) Moss Trim Lines (B16)
	leduced Iron (C4) Dry-Season Water Table (C2)
	eduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3) Thin Muck Sui	
Algal Mat or Crust (B4) Other (Explain	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3) Microtopographic Relief (D4)
Water-Stained Leaves (B9) Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	TAO-Noutal Test (B0)
Surface Water Present? Yes No Depth (inches	s): 0.5
Water Table Present? Yes ✓ No Depth (inches	
Saturation Present? Yes Vo Depth (inches	
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if available:
Remarks:	

VEGETATION (Four Strata) - Use scientific names of plants.

50% of total cover: 52.5 20% of total cover: 21

50% of total cover: 0 20% of total cover:

Present?

0 = Total Cover

50% of total cover: 0 20% of total cover: 0

50% of total cover: __ 5

30'

Sapling/Shrub Stratum (Plot size: 30'

30'

Tree Stratum (Plot size: _

1. Salix nigra

Herb Stratum (Plot size: _ 1. Epilobium coloratum

2. Bidens frondosa

6. Poa trivialis

3. Typha angustifolia

7 Scirpus atrovirens

8. Juncus effusus

10. Juncus tenuis

11. Carex frankii

4. Microstegium vimineum

9. Eupatorium perfoliatum

5. Euthamia graminifolia

mes of	plants.		Sampling P	oint: W-KP14			
Absolute			Dominance Test worksheet:				
% Cover	Species?	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)		
			Total Number of Dominant Species Across All Strata:	4	(B)		
			Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)		
			Prevalence Index worksheet:	•			
			Total % Cover of:				
	= Total Cov	^		x 1 =			
_ 20% of	total cover	:0	'	x 2 =			
10	,	OBL			_		
10		OBL	· —	x 3 =	_		
			· —	x 4 =			
			<u> </u>	x 5 =			
			Column Totals:	(A)	(B)		
			Prevalence Index = B/A	=			
			Hydrophytic Vegetation India	cators:			
			✓ 1 - Rapid Test for Hydroph				
			✓ 2 - Dominance Test is >50	1%			
			3 - Prevalence Index is ≤3	.0 ¹			
10 = Total Cover		_	4 - Morphological Adaptations ¹ (Provide supporting				
_ 20% of	total cover	: 2	data in Remarks or on	a separate sheet)		
10		FACW	Problematic Hydrophytic V	egetation ¹ (Expla	ain)		
10		FACW					
5		OBL	¹ Indicators of hydric soil and w		must		
5		FAC	be present, unless disturbed or	-			
5		FACW	Definitions of Four Vegetatio	on Strata:			
5		FACW	Tree - Woody plants, excluding	g vines, 3 in. (7.6	cm) or		
20		OBL	more in diameter at breast heigh	ght (DBH), regard	lless of		
20		FACW	height.				
5		FACW	Sapling/Shrub – Woody plant				
5		FAC	than 3 in. DBH and greater tha m) tall.	n or equal to 3.2	8 ft (1		
15		OBL					
105	——▼—— Total Cov		Herb – All herbaceous (non-wood of size, and woody plants less		ardless		
	total cover		Woody vine – All woody vines		8 ft in		
			height.				

Woody Vine Stratum (Plot size: 15')

Yes _ ✓ _ No ____

Sampling Point: W-KP14

SOIL

dric Soils³:
17)
E40\
F19)
(TF12)
(11-12)
etation and
resent,
ıtic.
No

Wetland ID W-KP14 Cowardin Code PEM Date 11/12/2019



Photograph Number 89
Photograph Direction SSE

Comments:



Photograph Number 90
Photograph Direction North

Comments:

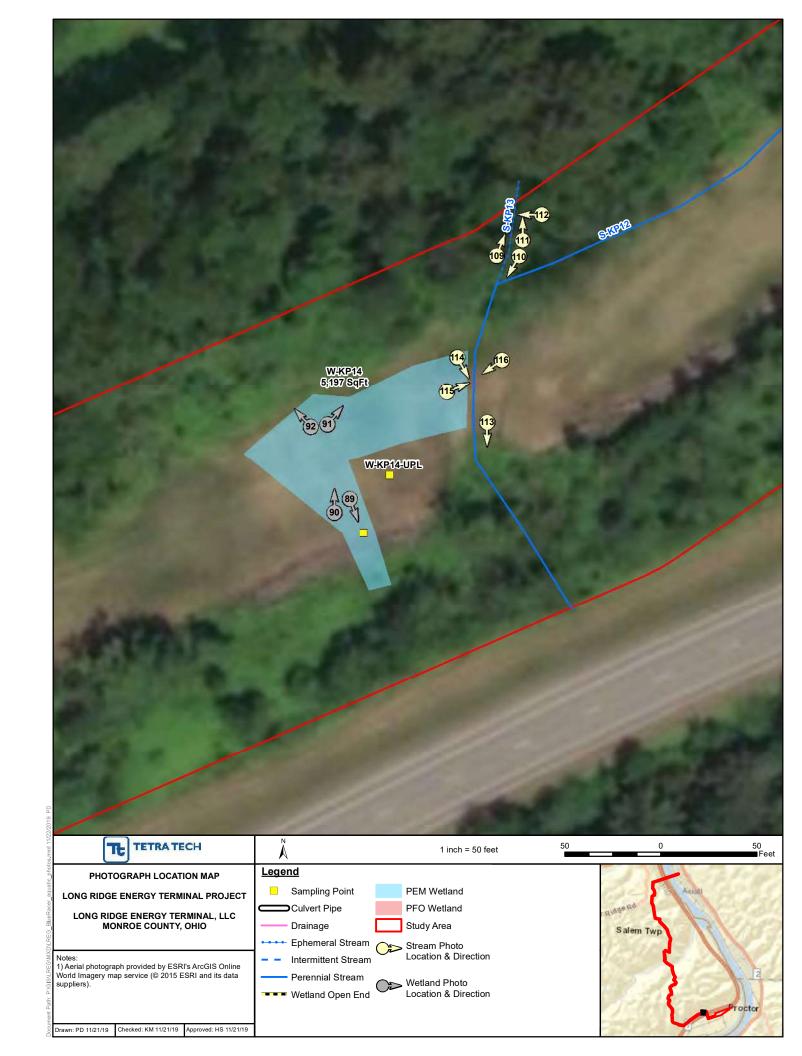


Photograph Number 91
Photograph Direction NE

Comments:



Photograph Number 92
Photograph Direction NW



Project/Site: Long Ridge Energy Terminal Pro	oject _{City/C}	_{ounty:} Monroe		Sampling Date: 11/12/2019
Applicant/Owner: Long Ridge Energy Termina	al, LLC	,		Sampling Point: W-KP15
		n, Township, Range: N/		
Landform (hillslope, terrace, etc.): Hillslope	Local reli			Slope (%): 6-10
Subregion (LRR or MLRA): LRRN La	39.709035			Datum: NAD 83
Soil Map Unit Name: Gilpin-upshur complex, 18	3 to 35 percent slop	es, moderately erod	ed NWI classific	cation: None
Are climatic / hydrologic conditions on the site typical				·
Are Vegetation, Soil, or Hydrology				,
			explain any answe	
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS – Attach site I			•	•
JOHNNAKT OF TINDINGS - Attach site i	map snowing sam	pinig point locatio	ms, transects	, important reatures, etc.
Hydrophytic Vegetation Present? Yes <u>✓</u>	No	Is the Sampled Area		
Hydric Soil Present? Yes <u>✓</u>	No	within a Wetland?	Yes <u>√</u>	No
Wetland Hydrology Present? Yes <u>√</u>	No			
Remarks: Cowardin Code: PEM	HGM: Slope	Water Type:	RPWWD	
LIVEROLOGY				
HYDROLOGY Westland Hydrology Indicators:			Coondan/India	store (minimum of two required)
Wetland Hydrology Indicators:	ak all that apply)			Crocks (PS)
Primary Indicators (minimum of one is required; che		244)	Surface Soil	
Surface Water (A1)	_ True Aquatic Plants (I _ Hydrogen Sulfide Odd		✓ Drainage Pa	getated Concave Surface (B8)
High Water Table (A2) Saturation (A3)	_ Oxidized Rhizosphere		<u>▼</u> Drainage Pa <u>Moss Trim Li</u>	
Saturation (AS)	Presence of Reduced			Water Table (C2)
Sediment Deposits (B2)	Recent Iron Reduction	` '	Crayfish Bur	
Drift Deposits (B3)	Thin Muck Surface (C			isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	_ Other (Explain in Ren			tressed Plants (D1)
Iron Deposits (B5)	_	,	·	Position (D2)
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	
Water-Stained Leaves (B9)				aphic Relief (D4)
Aquatic Fauna (B13)			✓ FAC-Neutral	Test (D5)
Field Observations:				
Surface Water Present? Yes No✓	Depth (inches):			
Water Table Present? Yes No✓	Depth (inches):			
	Depth (inches):	Wetland H	lydrology Preser	nt? Yes <u>√</u> No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring	well aerial photos prev	vious inspections) if ava	ilahle:	
Describe Necorded Data (stream gauge, monitoring	well, aeriai priotos, pre	vious irispections), ii ava	liable.	
Remarks:				

VEGETATION (Four Strata) - Use scientific names of plants.

50% of total cover: ___0

50% of total cover: ___0

Sapling/Shrub Stratum (Plot size: 30')

% Cover Species? Status

= Total Cover

__ 20% of total cover:___0

0 = Total Cover

15

10

5

5

20

<u>5</u> 10

50

50% of total cover: 0 20% of total cover:

50% of total cover:

20% of total cover: 0

FACW

FACW

FACW

FAC

FAC

FACW

FACW

FACW

FAC

OBL

_____ = Total Cover ___ 20% of total cover: 20

0 = Total Cover

Tree Stratum (Plot size: _

3. Echinochloa muricata

5. Euthamia graminifolia

7. Cyperus eculentus

8. Juncus effusus

9. Juncus tenuis

_{10.} Carex frankii

4. Microstegium vimineum

Woody Vine Stratum (Plot size: 15'

2. Bidens frondosa

6. Poa trivialis

	Sampling Point: W-KP15	
	Dominance Test worksheet:	
_	Number of Dominant Species That Are OBL, FACW, or FAC:3	(A)
- -	Total Number of Dominant Species Across All Strata: 3	В)
-	Percent of Dominant Species That Are OBL, FACW, or FAC:	A/B)
-	Prevalence Index worksheet:	
-	Total % Cover of: Multiply by:	
	OBL species x 1 =	
-		
	FACW species x 2 =	
-	FAC species x 3 =	
-	FACU species x 4 =	
_	UPL species x 5 =	
-	Column Totals: (A)	(B)
-	Prevalence Index = B/A =	
-	Hydrophytic Vegetation Indicators:	
-	✓ 1 - Rapid Test for Hydrophytic Vegetation	
-	✓ 2 - Dominance Test is >50%	
-	3 - Prevalence Index is ≤3.0 ¹	
	4 - Morphological Adaptations¹ (Provide suppo	ortina
-	data in Remarks or on a separate sheet)	9
	Problematic Hydrophytic Vegetation ¹ (Explain))
-		
- -	¹ Indicators of hydric soil and wetland hydrology mu be present, unless disturbed or problematic.	ıst
-	Definitions of Four Vegetation Strata:	
- -	Tree – Woody plants, excluding vines, 3 in. (7.6 cn more in diameter at breast height (DBH), regardles height.	
	Capling/Chaple Woods starts and other days to	
	Sapling/Shrub – Woody plants, excluding vines, le than 3 in. DBH and greater than or equal to 3.28 ft	
	m) tall.	('
-	Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.	less
-	Woody vine – All woody vines greater than 3.28 ft height.	in
- [
-		
-		
-	Hydrophytic	
-	Vegetation Present? Yes ✓ No	
- 1		

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

Sampling Point: W-KP15

<i>.</i>	Matrix			x Features	- 1 . 3		Б	
nches)	Color (moist)	<u>%</u>	Color (moist)		Type ¹ Loc ²			
0-10	2.5Y 5/2	85	10YR 4/6	150	C <u>M/P</u>	L GRO	<u></u>	
						_		
						_		
						_		
-						_		
							· ·	
			Deduced Metric MC			21	DI Dana Linina M Matrix	
	ncentration, D=Depl	etion, RM=	Reduced Matrix, MS	s=Masked Sa	and Grains.		n: PL=Pore Lining, M=Matrix. ndicators for Problematic Hydric Sc	.:.a ³ .
ydric Soil I			5 10 ((07)		'		ons :
_ Histosol	• •		Dark Surface		(00) (11) 54	-	2 cm Muck (A10) (MLRA 147)	
	ipedon (A2)				(S8) (MLRA 1		Coast Prairie Redox (A16)	
_ Black His					/ILRA 147, 14 \	5)	(MLRA 147, 148)	
	n Sulfide (A4) Layers (A5)		✓ Loamy Gleye✓ Depleted Ma)	-	Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
	ck (A10) (LRR N)		Redox Dark				Very Shallow Dark Surface (TF12)	`
	Below Dark Surface	(A11)	Depleted Dar	` ,	7)	_	Other (Explain in Remarks)	,
_	rk Surface (A12)	(/ (/)	Redox Depre		• ,	-	Other (Explain in Remarks)	
	ucky Mineral (S1) (L	RR N.	Iron-Mangan		(F12) (LRR N			
	. 147, 148)	,	MLRA 13		(· ·-/ (- ·····			
	leyed Matrix (S4)			•	RA 136, 122		³ Indicators of hydrophytic vegetation	and
	edox (S5)				s (F19) (MLR		wetland hydrology must be present,	
-	Matrix (S6)) (MLRA 127,		unless disturbed or problematic.	
estrictive L	ayer (if observed):				-			
Type: Co	urse fragments							
Depth (inc						Hydrid	Soil Present? Yes No _	
						,		
Remarks:								
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	Mes).							
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Wetland ID W-KP15 Cowardin Code PEM Date 11/12/2019



Photograph Number 93
Photograph Direction NW

Comments:



Photograph Number 94
Photograph Direction South

Comments:

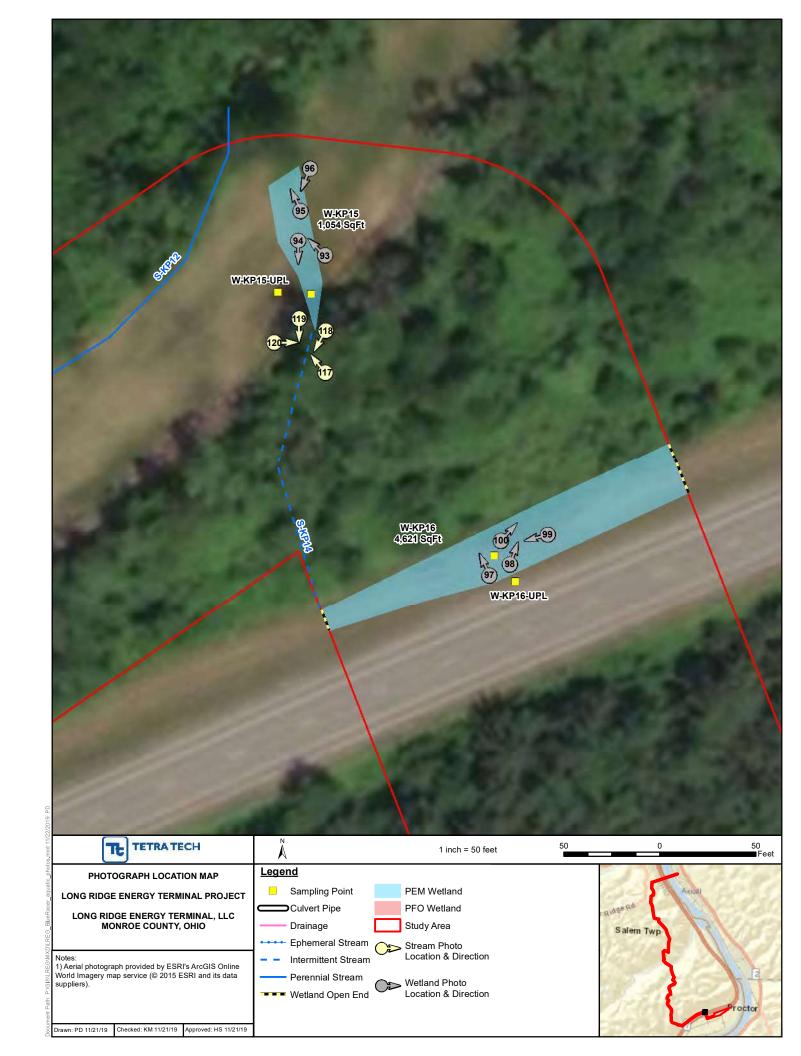


Photograph Number 95
Photograph Direction WNW

Comments:



Photograph Number 96
Photograph Direction SSW



Project/Site: Long Ridge Energy Terminal Project	ct City/Co	_{unty:} Monroe		Sampling Date: 11/12/2019
Applicant/Owner: Long Ridge Energy Terminal, L	LC			Sampling Point: W-KP14,W-KP15-UPL
Investigator(s): JM, KP	Section	ı, Township, Range: N		
Landform (hillslope, terrace, etc.): Hillslope	Local relie	f (concave, convex, noi	_{ne):} Linear	Slope (%): 6-10
Subregion (LRR or MLRA): LRRN Lat: 3		Long: -80		Datum: NAD 83
Soil Map Unit Name: Gilpin-upshur complex, 18 to				
Are climatic / hydrologic conditions on the site typical for the				
				•
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology		•	explain any answer	,
SUMMARY OF FINDINGS – Attach site map	p snowing samp	oling point location	ons, transects,	important features, etc.
Hydrophytic Vegetation Present? Yes				
Hydric Soil Present? Yes	No <u> </u>	within a Wetland?	Yes	No <u></u>
Wetland Hydrology Present? Yes	No <u>√</u>			
Remarks: Cowardin Code: UPLAND H	GM:	Water Type:		
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indicat	tors (minimum of two required)
Primary Indicators (minimum of one is required; check al	ll that apply)		Surface Soil (
, · · · · · · · · · · · · · · · · · · ·	ue Aquatic Plants (B	14)		etated Concave Surface (B8)
	ydrogen Sulfide Odor		Drainage Pat	
	-	s on Living Roots (C3)		1 1
	resence of Reduced	=	Dry-Season V	
	ecent Iron Reduction	in Tilled Soils (C6)	Crayfish Burr	ows (C8)
Drift Deposits (B3) Th	nin Muck Surface (C7	')	Saturation Vis	sible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Ot	ther (Explain in Rema	arks)	Stunted or St	ressed Plants (D1)
Iron Deposits (B5)			Geomorphic I	` '
Inundation Visible on Aerial Imagery (B7)			Shallow Aqui	
Water-Stained Leaves (B9)				phic Relief (D4)
Aquatic Fauna (B13)			FAC-Neutral	Test (D5)
Field Observations: Surface Water Present? Yes No ✓ D) th- (i h).			
		• • • • • • • • • • • • • • • • • • •		
Saturation Present? Yes No / _ D (includes capillary fringe)	epth (inches):	Wetland F	Hydrology Presen	t? Yes No √
Describe Recorded Data (stream gauge, monitoring well	l, aerial photos, previ	ous inspections), if ava	ilable:	
Remarks:				
Remarks.				

Garribilia i Girit.	Sampling	Point: W-KP14,W-KP15-UPI
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001	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size:30')	% Cover	Species?	Status	Number of Dominant Species	
1				· · · · · · · · · · · · · · · · · · ·	(A)
2		-		Total Number of Dominant	
3				F	(B)
4.					(-)
5				Percent of Dominant Species That Are OBL FACW or FAC:	(A (D)
6				That Are OBL, FACW, or FAC:	(A/B)
7.				Prevalence Index worksheet:	
r	0	= Total Cov		Total % Cover of: Multiply by:	
50% of total cover: 0				OBL species x 1 =	
Sapling/Shrub Stratum (Plot size: 30')	20 /6 01	total cover		FACW species x 2 =	
				FAC species x 3 =	
1					
2				FACU species x 4 =	
3				UPL species x 5 =	
4		-		Column Totals: (A)	_ (B)
5				Prevalence Index = B/A =	
6					
7				Hydrophytic Vegetation Indicators:	
8				1 - Rapid Test for Hydrophytic Vegetation	
9.				2 - Dominance Test is >50%	
9		T . 1 . 1 . 0		3 - Prevalence Index is ≤3.0 ¹	
50% of total cover: 0		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide supp	orting
001	20% 01	total cover		data in Remarks or on a separate sheet)	
Herb Stratum (Plot size: 30') 1. Trifolium pratense	30	,	FACU	Problematic Hydrophytic Vegetation ¹ (Explain	1)
					,
2. Phleum pratense	20	√	FACU	¹ Indicators of hydric soil and wetland hydrology m	uet
3. Symphyotrichum ericoides	15		FACU_	be present, unless disturbed or problematic.	usi
4. Bidens frondosa	15		FACW	Definitions of Four Vegetation Strata:	
5. Dactylis glomerata	10		FACU	Deminitions of Four Vegetation Strata.	
6 Solidago canadensis	15		FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 c	
<u> </u>				more in diameter at breast height (DBH), regardle	ss of
7				height.	
8				Sapling/Shrub – Woody plants, excluding vines,	
9				than 3 in. DBH and greater than or equal to 3.28 f	ft (1
10				m) tall.	
11	405			Herb – All herbaceous (non-woody) plants, regard	dless
50.4		= Total Cov	0.4	of size, and woody plants less than 3.28 ft tall.	
50% of total cover: 52.5	20% of	total cover	21	Woody vine – All woody vines greater than 3.28	ft in
Woody Vine Stratum (Plot size: 15')				height.	
1					
2					
3.					
4					
5		-		Hydrophytic	
<u></u>	0	= Total Cov		Vegetation Present? Yes No✓	
50% of total cover: 0		total cover			
		total cover			
Remarks: (Include photo numbers here or on a separate s	neet.)				

Profile Desc	cription: (Describe t	o the depth	needed to docum	nent the i	ndicator	or confirm	the absence	e of indicate	ors.)		
Depth	Matrix		Redo	x Features	3						
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²	Texture		Remark		
0-3	2.5Y 4/4	60					GRCL		disturbed	soils	
3-15	2.5Y 5/4	40									
								_			
								_			
								_			
								_			
								_			
			_								
-											
	oncentration, D=Depl	etion, RM=R	Reduced Matrix, MS	S=Masked	Sand Gra	ins.		PL=Pore Lini			3
Hydric Soil	Indicators:							cators for P		-	s":
Histosol			Dark Surface					2 cm Muck (
	pipedon (A2)		Polyvalue Be				148)	Coast Prairie		6)	
	stic (A3)		Thin Dark Su			47, 148)		(MLRA 14			
	en Sulfide (A4)		Loamy Gleye		F2)		_	Piedmont Flo	•	ls (F19)	
	d Layers (A5)		Depleted Mar		۵)			(MLRA 13		(TE 40)	
	ick (A10) (LRR N)	. (Δ11)	Redox Dark					Very Shallov Other (Expla			
	d Below Dark Surface ark Surface (A12)	: (A11)	Depleted Dar Redox Depre					Other (Expla	ıın ın Kemar	KS)	
	Jucky Mineral (S1) (L	RR N	Iron-Mangan			RR N					
	A 147, 148)	ixix i v ,	MLRA 13		55 (I IZ) (I	-IXIX I V ,					
	Gleyed Matrix (S4)		Umbric Surfa	-	MI RA 13	6 122)	³ lr	ndicators of h	vdrophytic v	egetation ar	nd
	Redox (S5)		Piedmont Flo					vetland hydro			
	Matrix (S6)		Red Parent N					ınless disturb			
	Layer (if observed):				, (1				
	ourse fragments										
	ches): 10+						Hydric Sc	oil Present?	Yes	No_v	/
	ones)		_				Tiyano oc				
Remarks:											

Project/Site: Long Ridge Energy Terminal I	Project City/C	_{ounty:} Monroe		Sampling Date: 11/12/2019				
Applicant/Owner: Long Ridge Energy Termi	nal, LLC	,		Sampling Point: W-KP16				
Investigator(s): JM, KP Section, Township, Range: N/A								
Landform (hillslope, terrace, etc.): Valley				Slope (%): 1-3				
Subregion (LRR or MLRA): LRRN				Datum: NAD 83				
Soil Map Unit Name: Made land				cation: None				
Are climatic / hydrologic conditions on the site typic	al for this time of year? Yo	es ✓ No (
Are Vegetation, Soil, or Hydrology	•			present? Yes No				
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.								
	,	7 31		., , , ,				
Hydrophytic Vegetation Present? Yes	V No	Is the Sampled Area						
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	✓ No	within a Wetland?	Yes <u>√</u>	No				
Domarka	V No	10/-1 T						
Cowardin Code: PEM	HGM: Slope	Water Type:	RPWWN					
HYDROLOGY								
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)				
Primary Indicators (minimum of one is required; of	heck all that apply)		Surface Soil Cracks (B6)					
Surface Water (A1)	True Aquatic Plants (F	314)	Sparsely Vegetated Concave Surface (B8)					
High Water Table (A2)	Hydrogen Sulfide Odd		✓ Drainage Pa	atterns (B10)				
Saturation (A3)	✓ Oxidized Rhizosphere	es on Living Roots (C3)	Moss Trim L					
Water Marks (B1)	Iron (C4)	Dry-Season	Water Table (C2)					
Sediment Deposits (B2)	Crayfish Burrows (C8)							
Drift Deposits (B3)	Saturation Visible on Aerial Imagery (C9)							
Algal Mat or Crust (B4)	Other (Explain in Rem	narks)	· 	Stressed Plants (D1)				
Iron Deposits (B5)				Position (D2)				
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (D3) Microtopographic Relief (D4)						
Water-Stained Leaves (B9)								
Aquatic Fauna (B13)			✓ FAC-Neutra	l Test (D5)				
Field Observations:	Double (in the ca):							
Surface Water Present? Yes No	Depth (inches):							
	Depth (inches):							
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):	Wetland H	lydrology Prese	nt? Yes No				
Describe Recorded Data (stream gauge, monitori	ng well, aerial photos, pre	vious inspections), if avai	ilable:					
Damada								
Remarks:								

rorksheet: Int Species W, or FAC: Deminant Strata: 2 (B)
ominant 2 (A)
ominant
••••••
Strata: (B)
nt Species
W, or FAC: 100 (A/B)
worksheet:
of: Multiply by:
x 1 =
x 2 =
x 3 =
x 4 =
x 5 =
(A) (B)
dex = B/A =
tation Indicators:
for Hydrophytic Vegetation
Test is >50%
Index is ≤3.0 ¹
cal Adaptations ¹ (Provide supporting
parks or on a separate sheet)
• , , ,
drophytic Vegetation ¹ (Explain)
soil and wetland hydrology must disturbed or problematic.
r Vegetation Strata:
o gotanon o natan
ts, excluding vines, 3 in. (7.6 cm) or breast height (DBH), regardless of
breast neight (DBH), regardless of
oody plants, excluding vines, less greater than or equal to 3.28 ft (1
greater than or equal to 0.20 it (1
(
ous (non-woody) plants, regardless plants less than 3.28 ft tall.
•
oody vines greater than 3.28 ft in
Yes ✓ No

Sampling Point: W-KP16

(inches)	<u>Matrix</u>			<u> Features</u>	_ 1	. ,		
_	Color (moist)	<u>%</u>	Color (moist)		-	Loc ²	Texture	Remarks
0-7	2.5Y 5/2	90	10YR 4/6	10	<u>C</u>	M/PL _	GRCL	
vpe: C=Co	ncentration, D=Depl	etion RM=	Reduced Matrix MS	=Masked S	Sand Grain		2l ocation: PI =	Pore Lining, M=Matrix.
/dric Soil lı		ouori, ruir	TOGGOOG MIGHIX, IVIC	- Maonoa C	Jana Gran			ors for Problematic Hydric Soils ³ :
_ Histosol (Dark Surface	(S7)				m Muck (A10) (MLRA 147)
	ipedon (A2)		Polyvalue Be		e (S8) (ML	RA 147, 1		ast Prairie Redox (A16)
_			Thin Dark Su					MLRA 147, 148)
	Sulfide (A4)		Loamy Gleye					dmont Floodplain Soils (F19)
_ Stratified	Layers (A5)		✓ Depleted Mat	rix (F3)			(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark S	, ,	•			ry Shallow Dark Surface (TF12)
_	Below Dark Surface	(A11)	Depleted Dar				Oth	ner (Explain in Remarks)
	rk Surface (A12)		Redox Depre					
	ucky Mineral (S1) (L	RR N,	Iron-Mangan		s (F12) (LF	RR N,		
	147, 148)		MLRA 13	•	II DA 426	400\	3 India	ators of budroubutio vocatation and
Sandy Gi Sandy Re	eyed Matrix (S4)		Umbric Surfa Piedmont Flo					ators of hydrophytic vegetation and and hydrology must be present,
	Matrix (S6)		Red Parent N					ss disturbed or problematic.
	ayer (if observed):				., (,,		
	urse fragments							
Depth (inc							Hydric Soil P	resent? Yes √ No
emarks:							Tiyuno con i	1000Ht. 100 110
Ciliains.								
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Wetland ID W-KP16 Cowardin Code PEM Date 11/12/2019



Photograph Number 97
Photograph Direction NNW

Comments:



Photograph Number 98
Photograph Direction NNE

Comments:

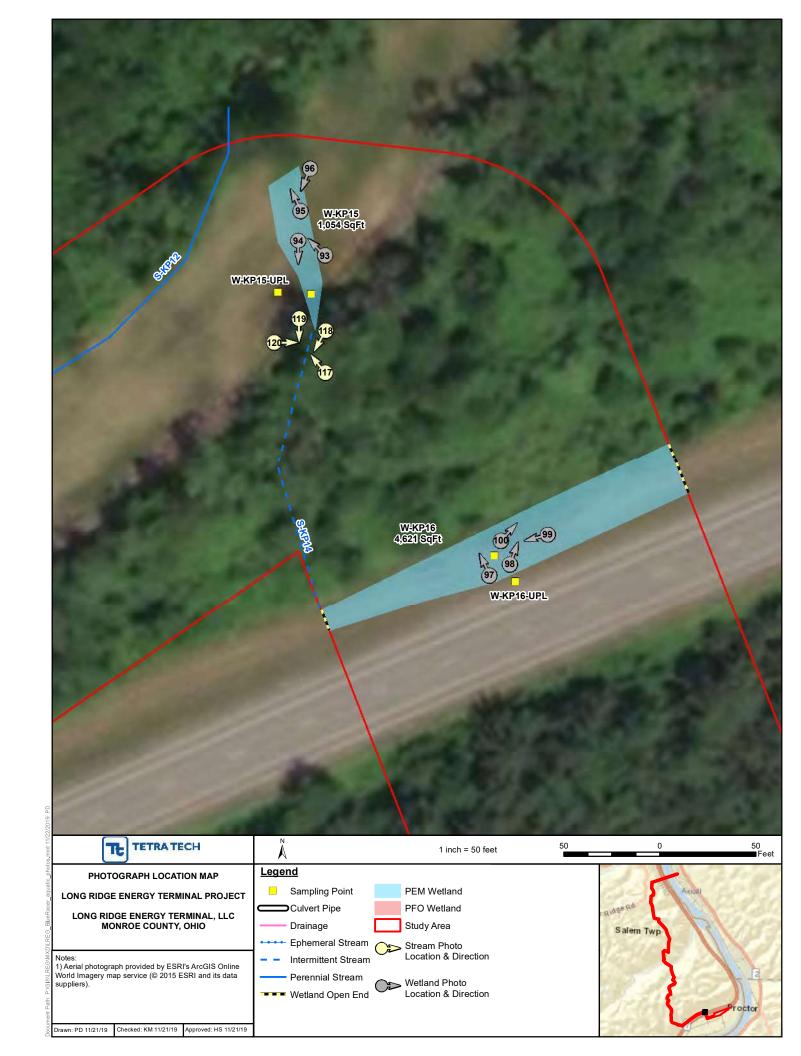


Photograph Number 99
Photograph Direction WSW

Comments:



Photograph Number 100
Photograph Direction NE



Project/Site: Long Ridge Energ	y Terminal Proj	ect Cit	ty/County: Monroe		Sampling Date: 11/12/2019		
Applicant/Owner: Long Ridge E			, , <u> </u>	State: OH	Sampling Point: W-KP16-UP		
Investigator(s): JM, KP							
Landform (hillslope, terrace, etc.):			ection, Township, Range: N		Slope (%): 4-1-4		
Subregion (LRR or MLRA): LRRN	l Lat:	39.708620	Long: -80	.846266	_{Datum:} NAD 83		
Soil Map Unit Name: Made land					cation: None		
Are climatic / hydrologic conditions of	on the site typical fo	or this time of vear?	? Yes ✓ No				
Are Vegetation, Soil		-			present? Yes No		
Are Vegetation, Soil				explain any answe			
SUMMARY OF FINDINGS -							
					.,		
Hydrophytic Vegetation Present?	Yes	,	Is the Sampled Area		1		
Hydric Soil Present? Wetland Hydrology Present?	Yes Yes	/	within a Wetland?	Yes	No <u> </u>		
Remarks: Cowardin Code:	<u> </u>		Water Type:				
HYDROLOGY							
Wetland Hydrology Indicators:				Secondary Indicate	ators (minimum of two required)		
Primary Indicators (minimum of on	e is required; check	(all that apply)		Surface Soil Cracks (B6)			
Surface Water (A1)		True Aquatic Plan	its (B14)	Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2)		Hydrogen Sulfide		Drainage Patterns (B10)			
Saturation (A3)			heres on Living Roots (C3)				
Water Marks (B1)	Presence of Reduced Iron (C4)			Dry-Season Water Table (C2)			
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6)				Crayfish Burrows (C8)			
Drift Deposits (B3)		Thin Muck Surface		Saturation Visible on Aerial Imagery (C9)Stunted or Stressed Plants (D1)			
Algal Mat or Crust (B4)		Other (Explain in F	Remarks)		· ·		
Iron Deposits (B5) Inundation Visible on Aerial Im	nageny (R7)			Geomorphic Position (D2) Shallow Aquitard (D3)			
Water-Stained Leaves (B9)	lagery (DT)			Microtopographic Relief (D4)			
Aquatic Fauna (B13)				FAC-Neutra	, , ,		
Field Observations:							
	s No	Depth (inches):					
	s No 🗸						
	s No 🗸			Hydrology Prese	nt? Yes No✓_		
(includes capillary fringe)							
Describe Recorded Data (stream ç	jauge, monitoring w	/eii, aeriai pnotos,	previous inspections), if ava	iliable:			
Remarks:							

Sampling	Point:	W-KP16-UPL
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30'	Absolute	Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size:30')	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:1 (A)
2				Total Number of Dominant
3				Species Across All Strata: 2 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 50 (A/B)
6				
7				Prevalence Index worksheet:
	0	= Total Cov	er	Total % Cover of: Multiply by:
50% of total cover:0	20% of	total cover:	0	OBL species X 1 =
Sapling/Shrub Stratum (Plot size: 15')				FACW species X Z =
1				
2				FACU species 60 x 4 = 240
3				UPL species 5 x 5 = 25
4				Column Totals:90 (A)340 (B)
5				Prevalence Index = B/A = 3.77
6				Trevalence maex B//
7				Hydrophytic Vegetation Indicators:
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
	0	= Total Cov	 er	3 - Prevalence Index is ≤3.0 ¹
50% of total cover:0		total cover:		4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')				data in Remarks or on a separate sheet)
1. Microstegium vimineum	25	✓	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Cichorium intybus	10		FACU	
3. Trifolium repens	30	√	FACU	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. Phleum pratense	10		FACU	Definitions of Four Vegetation Strata:
5. Dactylis glomerata	10		FACU	Definitions of Four Vegetation Strata:
6. Daucus carota	5		UPL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
7 Alopecurus sp.	10		ND	more in diameter at breast height (DBH), regardless of height.
8.				noight.
9.				Sapling/Shrub – Woody plants, excluding vines, less
10.				than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
11.				
···	100	Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 50		total cover:	~~	of size, and woody plants less than 5.20 it tall.
Woody Vine Stratum (Plot size: 15')	20 /0 01	total covor.		Woody vine – All woody vines greater than 3.28 ft in
1				height.
2				
3				
4				Hydrophytic
5	0			Vegetation Present? Yes No✓
50% of total cover: 0		= Total Cov total cover:		100 <u> </u>
	_	total cover.		
Remarks: (Include photo numbers here or on a separate sl ND- Species not determined.	neet.)			
, , , , , , , , , , ,				

Sampling Point: W-KP16-UPL

Depth	Matrix		Redox Features	.2 -	.	D	
nches)	Color (moist)	<u>%</u>	Color (moist) % Type ¹ Loc		ture CL	Remarks	1
0-4	10YR 4/2	100					
4-7	10YR 5/2	<u>70 </u>		<u>G</u> F	RSIL_	Disturbed	l soils
	10YR 6/1	30					
		· — –					
		· -					
			adversed Matrix, MC-Marked Cond Coning	21		: M-M-t-i-	
	oncentration, בישטפסו Indicators:	ietion, Rivi=Re	educed Matrix, MS=Masked Sand Grains.	Loca	tion: PL=Pore Lin Indicators for P		
Histosol			Dark Surface (S7)			A10) (MLRA	
	pipedon (A2)		Polyvalue Below Surface (S8) (MLRA	147, 148)		e Redox (A16	
_ Black Hi			Thin Dark Surface (S9) (MLRA 147, 14		(MLRA 14		′)
_	n Sulfide (A4)		Loamy Gleyed Matrix (F2)	,		oodplain Soils	s (F19)
Stratified	Layers (A5)		Depleted Matrix (F3)		(MLRA 13	36, 147)	
=	ıck (A10) (LRR N)		Redox Dark Surface (F6)			v Dark Surfac	
-	Below Dark Surface	e (A11)	Depleted Dark Surface (F7)		Other (Expla	in in Remark	s)
	ark Surface (A12)	DD 11	Redox Depressions (F8)				
	lucky Mineral (S1) (L	.RR N,	Iron-Manganese Masses (F12) (LRR N	N,			
	A 147, 148) Gleyed Matrix (S4)		MLRA 136) Umbric Surface (F13) (MLRA 136, 122	2)	³ Indicators of h	vdronhytic ve	agetation and
	ledox (S5)		Piedmont Floodplain Soils (F19) (MLR		wetland hydro		-
-	Matrix (S6)		Red Parent Material (F21) (MLRA 127		unless disturb		
	_ayer (if observed):			, , , , , , , , , , , , , , , , , , , 			
Type: Co	ourse fragments						
Depth (in	ches): <u>7</u> +		_	Hydi	ric Soil Present?	Yes	No √ _
emarks:	,						

Project/Site: Long Ridge Energy Terminal Project City/County:	Monroe Sampling Date: 07/17/19
	State: OH Sampling Point: W-KM1
Investigator(s): JDL, KMM Section, Tov	
Landform (hillslope, terrace, etc.): Depression Local relief (cor	
Subregion (LRR or MLRA): LRRN Lat: 39.708334	
Soil Map Unit Name: Made Land	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes	
Are Vegetation, Soil, or Hydrology significantly disturbed?	
Are Vegetation, Soil, or Hydrology naturally problematic?	(If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling	y point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No Is the	
Hudrig Call Draggard	e Sampled Area n a Wetland? Yes ✓ No
Wetland Hydrology Present? Yes ✓ No	ii a Wellaliu: Tes NO
Remarks: Cowardin Code: PEM HGM: Depressional	Water Type: NRPWW
Wetland is already silt and construction fenced off.	,
Wettand is already sint and construction lended on.	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
✓ Surface Water (A1) True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)
✓ High Water Table (A2) Hydrogen Sulfide Odor (C1)	
✓ Saturation (A3) — Oxidized Rhizospheres on L	
Water Marks (B1) Presence of Reduced Iron (
Sediment Deposits (B2) Recent Iron Reduction in Til	
Drift Deposits (B3) Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
✓ Algal Mat or Crust (B4) — Other (Explain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches):3	
Water Table Present? Yes <u>✓</u> No Depth (inches): 0	
Saturation Present? Yes <u>✓</u> No Depth (inches): 0	Wetland Hydrology Present? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous i	nenactions) if available:
Describe Necorded Data (Stream gauge, monitoring well, aerial priotos, previous i	ispections), ii avaliable.
Remarks:	

VEGETATION (Four Strata) - Use scientific names of plants.

Sapling/Shrub Stratum (Plot size: 15')

50% of total cover: 12.5 20% of total cover: 5

50% of total cover: ___0

50% of total cover: 47.5 20% of total cover: 19

50% of total cover: 0 20% of total cover:

Tree Stratum (Plot size: _

Herb Stratum (Plot size: _ 1. Leersia oryzoides

3. Phleum pratense

5. Epilobium coloratum

Woody Vine Stratum (Plot size: 15')

4. Persicaria pennsylvanica

2. Juncus tenuis

6. Agrostis gigantea

7. Juncus effusus

1. Quercus palustris

nes of	plants.		Sampling	Point: W-KM1	
bsolute			Dominance Test workshee	t:	
25	Species? ✓	FACW	Number of Dominant Specie That Are OBL, FACW, or FA	^	(A)
			Total Number of Dominant Species Across All Strata:	4	(B)
			Percent of Dominant Species That Are OBL, FACW, or FA		(A/E
			Prevalence Index workshe	et:	
25 :	Total Cov		Total % Cover of:	Multiply by:	
	total cover:		OBL species	x 1 =	
2070 01	total oover.		FACW species	x 2 =	
			FAC species	0	
			FACU species	x 4 =	
			UPL species	x 5 =	
-			Column Totals:		(R
			Goldinii Totals.	_ (^)	(0
			Prevalence Index = B/	A =	
			Hydrophytic Vegetation Inc	dicators:	
			1 - Rapid Test for Hydro	phytic Vegetation	
			✓ 2 - Dominance Test is >	50%	
			3 - Prevalence Index is :	≤3.0 ¹	
	= Total Cov	_	4 - Morphological Adapt	ations ¹ (Provide supp	ortir
20% of	total cover:		data in Remarks or o		
00	,	OBL	Problematic Hydrophytic	· : Vegetation¹ (Explain	1)
30 15					,
		FAC	¹ Indicators of hydric soil and	wetland hydrology mi	ust
15		FACU	be present, unless disturbed		
10		FACW_	Definitions of Four Vegeta	tion Strata:	
5		FACW_	Troe Woody planta evalua	ling vinos 2 in /7 6 o	m)
10		FACW FACW	Tree – Woody plants, excluded more in diameter at breast his height.		
			Sapling/Shrub – Woody pla than 3 in. DBH and greater t m) tall.		
	Total Cov	4.0	Herb – All herbaceous (nonof size, and woody plants les		lles
20% of	total cover:	19	Woody vine – All woody vin height.	es greater than 3.28 f	t in
	= Total Cov	_	Hydrophytic Vegetation Present? Yes <u>v</u>	∕ No	

Remarks: (Include	photo	numbers	here or	r on a	a se	parate	sheet.)
------------	---------	-------	---------	---------	--------	------	--------	--------	---

Only one pin oak present in wetland at far western end.

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the i	ndicator	or confirm	the absen	ce of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	
0-16	10YR 3/2	35_					GRSL	
	10YR 4/1	40_	7.5YR 5/6	10_	<u>C</u>	M/PL	GRSL	
	10YR 4/3	15_					GRSL	
¹Type: C=Co	oncentration, D=Depl	etion, RM=	———— Reduced Matrix, MS	=Masked	Sand Gra	ains.	² Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I		·	·					icators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	(S7)				2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be		ce (S8) (N	ILRA 147,	148)	Coast Prairie Redox (A16)
Black Hi			Thin Dark Su				,	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye			, ,		Piedmont Floodplain Soils (F19)
	Layers (A5)		✓ Depleted Mat		,			(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark S		6)			Very Shallow Dark Surface (TF12)
	Below Dark Surface	(A11)	Depleted Dar	•	,			Other (Explain in Remarks)
	ark Surface (A12)	()	Redox Depre					тан (<u>—</u> ф
	lucky Mineral (S1) (L	RR N	Iron-Mangane			I RR N		
	147, 148)		MLRA 130) (i i i i i i i i i i i i i i i i i i i			
	ileyed Matrix (S4)		Umbric Surfa		MIRA 13	6 122)	31	ndicators of hydrophytic vegetation and
	edox (S5)		Piedmont Flo					wetland hydrology must be present,
	Matrix (S6)		Red Parent M					unless disturbed or problematic.
	_ayer (if observed):		Neu i aleiit iv	iateriai (i z	Z I) (IVILIX	A 121, 141	,	unless disturbed of problematic.
Type:	-uyo. (oboo. rou).							
Depth (inc	ches):						Hydric Se	oil Present? Yes _ ✓ No
Remarks:								
1								

Wetland Photograph Page

Wetland ID W-KM1 Cowardin Code PEM Date 07/17/19



Photograph Number 101
Photograph Direction NW

Comments:



Photograph Number 102

Photograph Direction South

Comments:



Photograph Number 103

Photograph Direction East

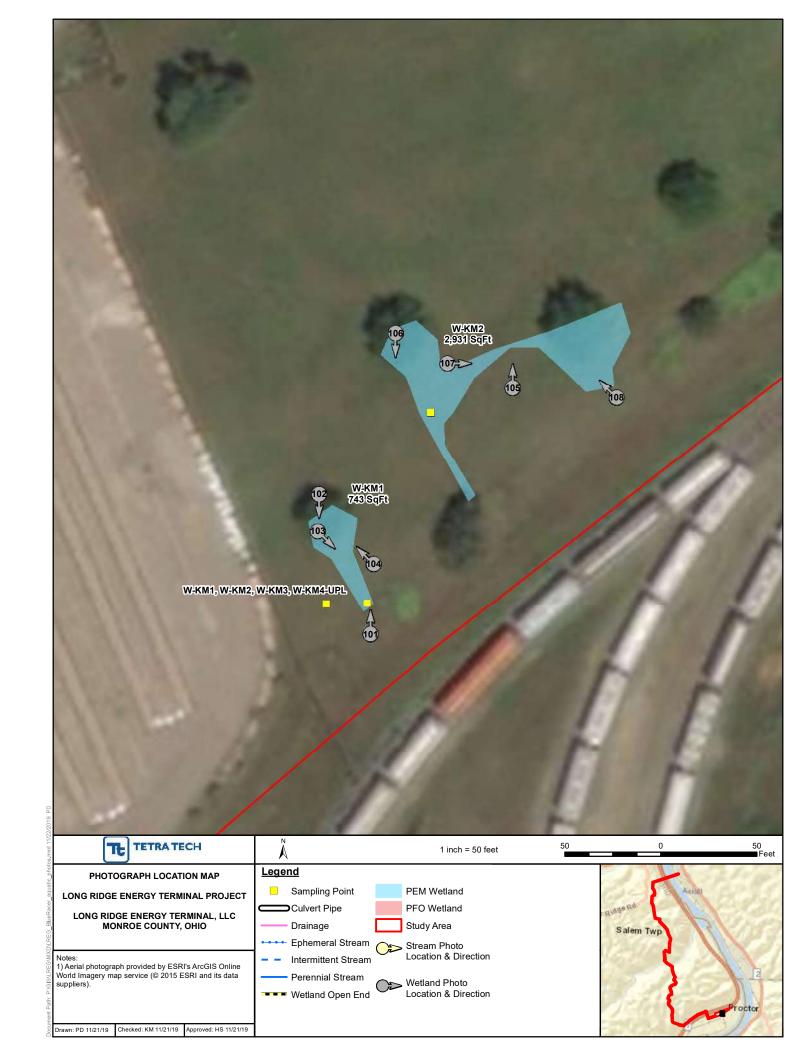
Comments:



Photograph Number 104
Photograph Direction West

Comments:

Henris.		



Project/Site: Long Ridge Ene	rgy Terminal Pr	oject	_ City/County: _	Monroe		_ Sampling Date: <u>07/17/19</u>
Applicant/Owner: Long Ridge	Energy Termina					Sampling Point: W-KM1, KM2, KM3, KM4-UPI
Investigator(s): KMM, JDL			_ Section, Town	nship, Range: N		
Landform (hillslope, terrace, etc.):	soil stockpile	area L				Slope (%): 0-3%
Subregion (LRR or MLRA): LRF			5	Long: -80	.839372	Datum: NAD 83
Soil Map Unit Name: Made Land					NWI classifi	
Are climatic / hydrologic condition		for this time of				
						present? Yes No
Are Vegetation, Soil					explain any answe	
						s, important features, etc.
SOMMAN OF THE BINGS	7 - Attach Site	iliap silowii		point location	Jiis, transect	s, important reatures, etc.
Hydrophytic Vegetation Present			- Is the	Sampled Area		
Hydric Soil Present?		No		a Wetland?	Yes	No <u>√</u>
Wetland Hydrology Present?	Yes	No ✓	_			
Remarks: Cowardin Code	e: UPLAND	HGM:		Water Type:		
Upland point taken	in the only porti	on of investig	gated termina	al site that ha	d vegetation a	nd soils. The remainder of
the property is an existing		•			J	
HYDROLOGY						
Wetland Hydrology Indicators	:				Secondary Indic	ators (minimum of two required)
Primary Indicators (minimum of		ck all that apply	')		Surface Soi	
Surface Water (A1)	<u> </u>	_ True Aquatic	•			egetated Concave Surface (B8)
High Water Table (A2)	_		Ifide Odor (C1)			atterns (B10)
Saturation (A3)	_		zospheres on Li	ina Roots (C3)	Moss Trim I	
Water Marks (B1)	_		Reduced Iron (C			Water Table (C2)
Sediment Deposits (B2)	_		Reduction in Tille		Crayfish Bu	
Drift Deposits (B3)	_	_ _ Thin Muck Su		, ,		/isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	_	_ Other (Explai	n in Remarks)			Stressed Plants (D1)
Iron Deposits (B5)					Geomorphic	Position (D2)
Inundation Visible on Aerial	Imagery (B7)				Shallow Aqu	uitard (D3)
Water-Stained Leaves (B9)					Microtopogr	aphic Relief (D4)
Aquatic Fauna (B13)					FAC-Neutra	l Test (D5)
Field Observations:		,				
	Yes No <u>✓</u>					
	Yes No <u></u>		,			
	Yes No <u></u>	Depth (inche	es):	Wetland I	Hydrology Prese	nt? Yes No✓
(includes capillary fringe) Describe Recorded Data (strean	n gauge, monitoring	ı well. aerial pho	otos, previous in	 spections), if ava	ailable:	
(·· gg-, ···-	, ,		,,		
Remarks:						

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				Total Number of Dominant
3				Species Across All Strata: 2 (B)
4.				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
6.				That Are OBL, FACW, or FAC.
7.				Prevalence Index worksheet:
··-	0	= Total Cov		Total % Cover of: Multiply by:
50% of total cover: 0				OBL species x 1 =
Sapling/Shrub Stratum (Plot size: 15')	20 /0 01	total cover.		FACW species x 2 =
				FAC species x 3 =
1		-		FACU species x 4 =
2				
3				
4				Column Totals: (A) (B)
5				Prevalence Index = B/A =
6				Hydrophytic Vegetation Indicators:
7				
8				1 - Rapid Test for Hydrophytic Vegetation
9.				2 - Dominance Test is >50%
··	0	= Total Cov	er	3 - Prevalence Index is ≤3.0 ¹
50% of total cover: 0		total cover:		4 - Morphological Adaptations ¹ (Provide supporting
Herb Stratum (Plot size: 5')		10101 00101		data in Remarks or on a separate sheet)
1. Phleum pratense	35	1	FACU	Problematic Hydrophytic Vegetation ¹ (Explain)
2. Dactylis glomerata	25		FACU	
3. Phytolacca americana	5			¹ Indicators of hydric soil and wetland hydrology must
			FACU_	be present, unless disturbed or problematic.
4. Dipsacus fullonum			FACU_	Definitions of Four Vegetation Strata:
5. Daucus carota	5	-	UPL	Tree Meaduralants avaluation viscos 2 in (7.0 cm) or
6. Achillea millefolium	5		FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
7. Solidago canadensis	5		FACU_	height.
8				One Provide the Management and the second of
9.				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1
10.				m) tall.
11				
	85	= Total Cov		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
50% of total cover: 42.5				or size, and woody plants less than 5.20 it tall.
Woody Vine Stratum (Plot size: 15')	20 /0 01	total cover.		Woody vine – All woody vines greater than 3.28 ft in
				height.
1				
2		-		
3				
4				Hydrophytic
5				Vegetation
		= Total Cov	_	Present? Yes No
50% of total cover:0	20% of	total cover	. 0	
Remarks: (Include photo numbers here or on a separate s	heet.)			

Profile Desc	cription: (Describe to	o the depth	needed to docum	ent the in	dicator o	r confirm	the absenc	e of indicate	ors.)		
Depth	Matrix			(Features							
(inches)	Color (moist)	<u>%</u>	Color (moist)	<u></u> %	Type ¹	Loc ²	Texture		Remarks		
0-18	10YR 5/4	100					GRSICL	<u> </u>	Stockpile	ed Fill	
			_					_			
								_			
-											
								_			
	oncentration, D=Deple	etion, RM=Re	educed Matrix, MS	=Masked	Sand Gra	ins.			ing, M=Matri		2
Hydric Soil	Indicators:								roblematic l	-	s³:
Histosol			Dark Surface						A10) (MLRA		
	oipedon (A2)		Polyvalue Be				148)		e Redox (A16	3)	
	stic (A3)		Thin Dark Su			47, 148)		(MLRA 14			
	en Sulfide (A4)		Loamy Gleye		2)		_		oodplain Soil	s (F19)	
	d Layers (A5)		Depleted Mat		-			(MLRA 13		(TE 40)	
	ıck (A10) (LRR N) d Below Dark Surface	(111)	Redox Dark S						v Dark Surfa in in Remark		
	ark Surface (A12)	(A11)	Depleted Dar Redox Depre					Otrier (Expia	IIII III Kelliair	(5)	
	lucky Mineral (S1) (L l	RR N	Iron-Mangane			RR N					
	A 147, 148)	,	MLRA 136		5 (1 12) (2	,					
	Gleyed Matrix (S4)		Umbric Surfa	•	MLRA 130	6. 122)	³ In	dicators of h	ydrophytic ve	egetation a	nd
	Redox (S5)		Piedmont Flo						logy must be		
	Matrix (S6)		Red Parent M						ed or proble		
	Layer (if observed):			•	, ,						
Type:											
	ches):		_				Hydric So	il Present?	Yes	No¹	/
Remarks:			_								
Remarks.											

Project/Site: Long Ridge Energy Te	erminal Project	City/County: Monroe		Sampling Date: 07/17/19		
Applicant/Owner: Long Ridge Energ				Sampling Point: W-KM2		
Investigator(s): JDL, KMM		Section, Township, Range: N		_		
Landform (hillslope, terrace, etc.): Dep				Slope (%): 0-3%		
Subregion (LRR or MLRA): LRRN						
Soil Map Unit Name: Made Land			NWI classific			
Are climatic / hydrologic conditions on th	e site typical for this time of ve	-				
Are Vegetation, Soil, or F				resent? Yes No		
Are Vegetation, Soil, or F			explain any answe			
SUMMARY OF FINDINGS – At						
			Jiis, transcots	, important reatures, etc.		
Hydrophytic Vegetation Present?	Yes <u>√</u> No	Is the Sampled Area				
Hydric Soil Present?	Yes No	within a Wetland?	Yes <u>√</u>	No		
Wetland Hydrology Present?	Yes <u>▼</u> No					
Remarks: Cowardin Code: PE	M HGM: Depre	essional Water Type:	NRPWW			
Wetland is already silt an	d construction fenced of	f in two locations, but a r	narrow strip tra	vels from one fence area		
to another. Only 2 pin oaks are p		·	·			
HYDROLOGY						
Wetland Hydrology Indicators:			Secondary Indica	tors (minimum of two required)		
Primary Indicators (minimum of one is	required; check all that apply)		Surface Soil			
✓ Surface Water (A1)	True Aquatic Pl	lants (B14)		getated Concave Surface (B8)		
High Water Table (A2)	Hydrogen Sulfic		Drainage Patterns (B10)			
Saturation (A3)		spheres on Living Roots (C3)	_			
Water Marks (B1)	Presence of Re			Water Table (C2)		
Sediment Deposits (B2)		duction in Tilled Soils (C6)	Crayfish Buri			
Drift Deposits (B3)	Thin Muck Surf		-	sible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain			tressed Plants (D1)		
Iron Deposits (B5)			Geomorphic	Position (D2)		
Inundation Visible on Aerial Image	ry (B7)		Shallow Aqui	tard (D3)		
Water-Stained Leaves (B9)			Microtopogra	phic Relief (D4)		
Aquatic Fauna (B13)			✓ FAC-Neutral	Test (D5)		
Field Observations:						
	✓ No Depth (inches)					
Water Table Present? Yes	✓ No Depth (inches)):0				
	✓ No Depth (inches)	:0 Wetland I	Hydrology Presen	t? Yes <u>√</u> No		
(includes capillary fringe) Describe Recorded Data (stream gauge	e. monitoring well, aerial photo	s. previous inspections), if ava	ailable:			
, 3 3	, , , ,	,,				
Remarks:						

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			Absolute	Dominant	Indicator	Dominance Test worksheet:		
ree Stratum (Plot size: _	30')		Species?				
Quercus palustris		, 	20	√	FACW	Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
						Total Number of Dominant Species Across All Strata:	4	(B)
						Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B
					·	Prevalence Index worksheet:		
				= Total Cov	er	Total % Cover of:	Multiply by:	
	50% of	total cover:	10 20% of			OBL species x	1 =	_
apling/Shrub Stratum(P	15	_				FACW species x	2 =	_
haping/onlub otlatum (i	101 3126					FAC species x		
•						FACU species x		
•						UPL species x		
J								
						Column Totals: (A)	_ (B)
i				-		Prevalence Index = B/A =		-
<u>-</u>						Hydrophytic Vegetation Indica	tors:	
•					·	✓ 1 - Rapid Test for Hydrophyt	ic Vegetation	
						✓ 2 - Dominance Test is >50%	-	
						3 - Prevalence Index is ≤3.0		
			0 =	= Total Cov	er er	4 - Morphological Adaptation		ortin
		total cover:	0 20% of	total cover	:0			,Ortin
lerb Stratum (Plot size: _	5')				data in Remarks or on a s		
_Typha latifolia			35		OBL	Problematic Hydrophytic Ve	jetation (Explair	٦)
Persicaria pennsylva	nica		15	√	FACW			
Juncus effusus					FACW	¹ Indicators of hydric soil and wetl		ıust
Eleocharis palustris				$\overline{\hspace{1cm}}$	OBL	be present, unless disturbed or p		
Juncus canadensis				·	FACW	Definitions of Four Vegetation	Strata:	
Agrostis gigantea					FACW	Tree – Woody plants, excluding	vines, 3 in. (7.6 c	m) o
Phleum pratense					FACU	more in diameter at breast heigh	t (DBH), regardle	ess o
Kyllinga gracillima					FACU	height.		
Cyperus strigosus			$-\frac{10}{5}$			Sapling/Shrub – Woody plants,		
0					FACW_	than 3 in. DBH and greater than m) tall.	or equal to 3.28	ft (1
1.			-			,		
·			105 :	Total Cov	er	Herb – All herbaceous (non-woo of size, and woody plants less the		dless
		total cover:	52.5 20% of	total cover	21	NA/ a pale continue and the continue and		£4 :
Voody Vine Stratum (Plo	t size:15'_)				Woody vine – All woody vines g height.		πın
						neight.		
					· ——			
ł					· ——	Hydrophytic		
j					·	Vegetation Present? Yes ✓	Na	
	50% of	total cover:	0 = 0 = 0	= Total Cov		Present? Yes <u>✓</u>	No	
N		· · · · · · · · · · · · · · · · · · ·		total cover				
Remarks: (Include photo		•	•					
Inly and nin adlensed	ent in wetla	and at far wo	estern end.					
only one pin oak pres	ociii iii wolic							
mly one pin oak pres	orit iii wolle							

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the i	ndicator	or confirm	the absen	ce of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	
0-16	10YR 3/2	35_					GRSL	
	10YR 4/1	40_	7.5YR 5/6	10_	<u>C</u>	M/PL	GRSL	
	10YR 4/3	15_					GRSL	
¹Type: C=Co	oncentration, D=Depl	etion, RM=	———— Reduced Matrix, MS	=Masked	Sand Gra	ains.	² Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I		·	·					icators for Problematic Hydric Soils ³ :
Histosol	(A1)		Dark Surface	(S7)				2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be		ce (S8) (N	ILRA 147,	148)	Coast Prairie Redox (A16)
Black Hi			Thin Dark Su				,	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye			, ,		Piedmont Floodplain Soils (F19)
	Layers (A5)		✓ Depleted Mat		,			(MLRA 136, 147)
	ck (A10) (LRR N)		Redox Dark S		6)			Very Shallow Dark Surface (TF12)
	Below Dark Surface	(A11)	Depleted Dar	•	,			Other (Explain in Remarks)
	ark Surface (A12)	()	Redox Depre					тине (<u>—</u> ф
	lucky Mineral (S1) (L	RR N	Iron-Mangane			I RR N		
	147, 148)		MLRA 130) (i i i i i i i i i i i i i i i i i i i			
	ileyed Matrix (S4)		Umbric Surfa		MIRA 13	6 122)	31	ndicators of hydrophytic vegetation and
	edox (S5)		Piedmont Flo					wetland hydrology must be present,
	Matrix (S6)		Red Parent M					unless disturbed or problematic.
	_ayer (if observed):		Neu i aleiit iv	iateriai (i z	Z I) (IVILIX	A 121, 141	,	unless disturbed of problematic.
Type:	-uyo. (oboo. rou).							
Depth (inc	ches):						Hydric Se	oil Present? Yes _ ✓ No
Remarks:								
1								

Wetland Photograph Page

Wetland ID W-KM2 Cowardin Code PEM Date 07/17/19



Photograph Number 105

Photograph Direction North

Comments:



Photograph Number 106
Photograph Direction South

Comments:



Photograph Number 107
Photograph Direction East

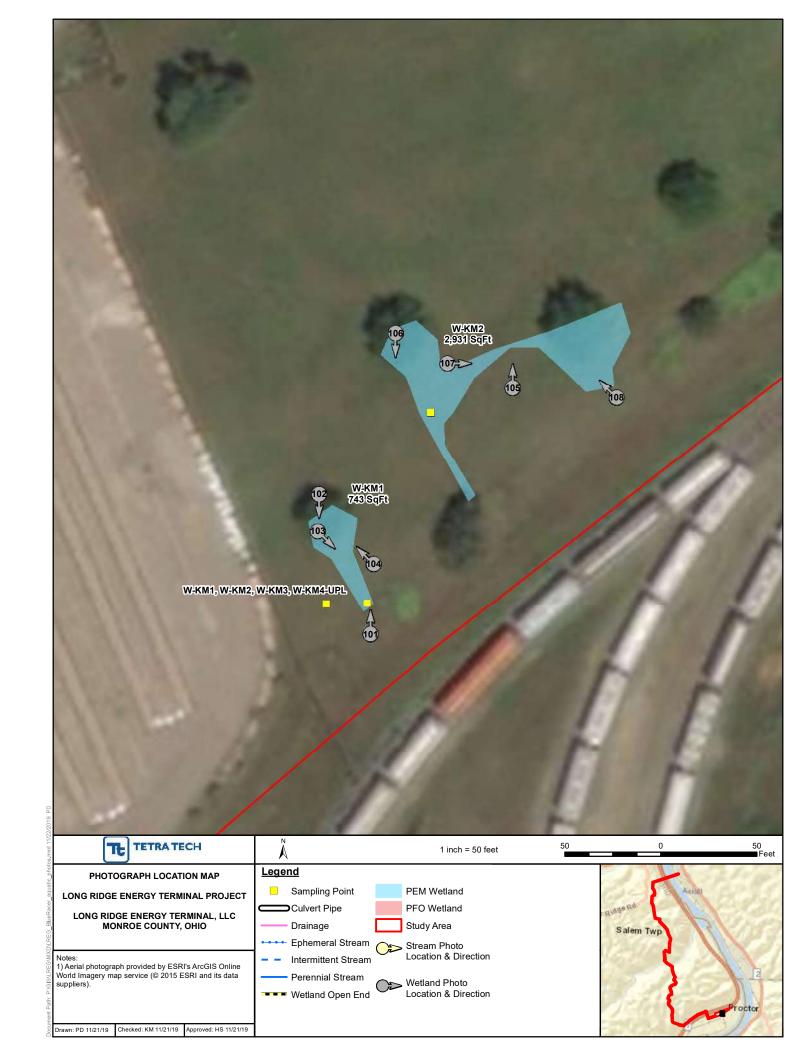
Comments:



Photograph Number 108
Photograph Direction NW

Comments:

1			
1			
1			
1			
1			



Project/Site: Long Ridge Energy Terminal Project City/C	county: Monroe Sampling Date: 07/17/19			
	State: OH Sampling Point: W-KM3			
Investigator(s): JDL, KMM Section, Township, Range: N/A				
Landform (hillslope, terrace, etc.): Depression Local rel	ief (concave, convex, none): Concave Slope (%): 0-3%			
Subregion (LRR or MLRA): LRRN Lat: 39.709015	Long: -80.838248 Datum: NAD 83			
Soil Map Unit Name: Made Land	NWI classification: N/A			
Are climatic / hydrologic conditions on the site typical for this time of year? Y	es No (If no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly distur	bed? Are "Normal Circumstances" present? Yes No			
Are Vegetation, Soil, or Hydrology naturally problems	atic? (If needed, explain any answers in Remarks.)			
SUMMARY OF FINDINGS – Attach site map showing sam	ppling point locations, transects, important features, etc.			
Hydrophytic Vegetation Present? Yes _ ✓ No				
Hydric Soil Present? Yes No	Is the Sampled Area			
Wetland Hydrology Present? Yes ✓ No	within a Wetland? Yes No			
Remarks: Cowardin Code: PEM HGM: Slope	Water Type: NRPWW			
1	- 1			
Wetland present east of stockpile along toe of slop	∂.			
HYDROLOGY				
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)			
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)			
Surface Water (A1) True Aquatic Plants (B14) Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2) Hydrogen Sulfide Od				
Saturation (A3)				
Water Marks (B1) Presence of Reduced	I Iron (C4) Dry-Season Water Table (C2)			
Sediment Deposits (B2) Recent Iron Reductio	n in Tilled Soils (C6) Crayfish Burrows (C8)			
Drift Deposits (B3) Thin Muck Surface (C	C7) Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4) Other (Explain in Rer	narks) Stunted or Stressed Plants (D1)			
Iron Deposits (B5)	✓ Geomorphic Position (D2)			
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)			
Water-Stained Leaves (B9)	Microtopographic Relief (D4)			
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)			
Field Observations:				
Surface Water Present? Yes No Depth (inches):				
Water Table Present? Yes No ✓ Depth (inches):				
Saturation Present? Yes No Depth (inches):	Wetland Hydrology Present? Yes <u>√</u> No			
(includes capillary fringe)	vieus inapastiana) if available.			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	vious inspections), ii available.			
Remarks:				

VEGETATION (Four Strata) – Use scientific names of plants.

/EGETATION (Four Strata) – Use scientific na	ames of	plants.		Sampling Point: W-KM3			
Absolute Dominant Indicator Dominance Test worksheet							
<u>Tree Stratum</u> (Plot size: 30'		Species?	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)			
				That Ale OBE, I AOW, OF I AO.			
2				Total Number of Dominant Species Across All Strata: 4 (B)			
3				Species Across All Strata: 4 (B)			
4				Percent of Dominant Species			
5				That Are OBL, FACW, or FAC:100% (A/B)			
6				Prevalence Index worksheet:			
1	0			Total % Cover of: Multiply by:			
50% of total cover:0		= Total Cov		OBL species x 1 =			
	20% 01	total cover.		FACW species x 2 =			
Sapling/Shrub Stratum (Plot size: 15')				FAC species x 3 =			
1				FACU species x 4 =			
2				UPL species x 5 =			
3				Column Totals: (A) (B)			
4				Column Totals (A) (B)			
5				Prevalence Index = B/A =			
6				Hydrophytic Vegetation Indicators:			
7				✓ 1 - Rapid Test for Hydrophytic Vegetation			
8				✓ 2 - Dominance Test is >50%			
9				3 - Prevalence Index is ≤3.0 ¹			
		= Total Cov	_	4 - Morphological Adaptations ¹ (Provide supporting			
50% of total cover: 0	20% of	total cover:	0	data in Remarks or on a separate sheet)			
Herb Stratum (Plot size: 5')		,	E4 (0) 47	Problematic Hydrophytic Vegetation¹ (Explain)			
1. Scirpus cyperinus			FACW	Troblematic Trydrophytic Vegetation (Explain)			
2. Persicaria pennsylvanica	25	<u>√</u>	FACW_	¹ Indicators of hydric soil and wetland hydrology must			
3. Juncus effusus	15		FACW_	be present, unless disturbed or problematic.			
4. Persicaria hydropiperoides	15		FACW_	Definitions of Four Vegetation Strata:			
{5.} Juncus canadensis	10		FACW				
6. Agrostis gigantea	5		FACW_	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of			
7. Carex vulpinoidea	5		OBL	height.			
8. Carex (ovales - terminal)	5			Sanling/Shrub Woody plants evaluding vines less			
9. Andropogon virginicus	10		FACU_	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1			
10				m) tall.			
11				Herb – All herbaceous (non-woody) plants, regardless			
	110	= Total Cov	er	of size, and woody plants less than 3.28 ft tall.			
50% of total cover: 55	20% of	total cover:	22	Woody vine – All woody vines greater than 3.28 ft in			
Woody Vine Stratum (Plot size: 15')				height.			
1							
2							
3							
4				Hydrophytic			
5				Hydrophytic Vegetation			
	0 :	= Total Cov	er	Present? Yes <u>√</u> No			
50% of total cover:0	20% of	total cover:	0				
Remarks: (Include photo numbers here or on a separate s	neet.)						

Profile Desc	cription: (Describe to	o the dept	h needed to docun	nent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	k Features	3			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-3	10YR 3/2	95	10YR 4/6	5_	С	M/PL	GRSL	
3-15	10YR 4/2	90	7.5YR 5/6	10	С	M	S	
						·		
					-			
					-			
	oncentration, D=Deple	etion, RM=	Reduced Matrix, MS	=Masked	Sand Gr	ains.		L=Pore Lining, M=Matrix.
Hydric Soil								ators for Problematic Hydric Soils ³ :
Histosol			Dark Surface					cm Muck (A10) (MLRA 147)
	pipedon (A2)		Polyvalue Be				148) C	oast Prairie Redox (A16)
Black Hi			Thin Dark Su			147, 148)	_	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye		F2)		P	iedmont Floodplain Soils (F19)
	d Layers (A5)		Depleted Mat		6)		V	(MLRA 136, 147) ery Shallow Dark Surface (TF12)
	ick (A10) (LRR N) d Below Dark Surface	(Δ11)	Redox Dark S Depleted Dar					ther (Explain in Remarks)
	ark Surface (A12)	(711)	Redox Depre					ther (Explain in Remarks)
	lucky Mineral (S1) (L l	RR N.	Iron-Mangane			LRR N.		
	\ 147, 148)	,	MLRA 136		() (,		
	Gleyed Matrix (S4)		Umbric Surfa	•	MLRA 13	86, 122)	³ Indi	icators of hydrophytic vegetation and
	Redox (S5)		Piedmont Flo					tland hydrology must be present,
-	Matrix (S6)		Red Parent M					ess disturbed or problematic.
Restrictive I	Layer (if observed):							-
Type:								
	ches):						Hydric Soil	Present? Yes √ No
Remarks:	,							

Wetland Photograph Page

Wetland ID W-KM3 Cowardin Code PEM Date 07/17/19



Photograph Number 109
Photograph Direction East

Comments:



Photograph Number ___110 ___ Photograph Direction SSW

Comments:



Photograph Number 111

Photograph Direction ESE

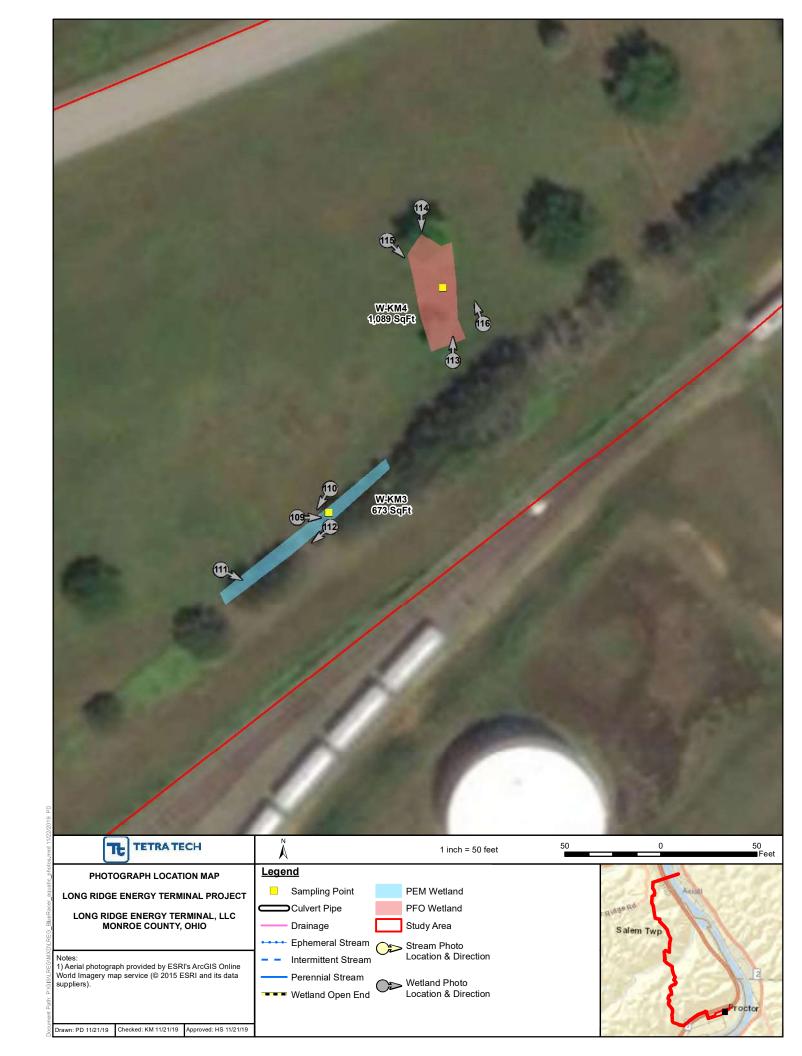
Comments:



Photograph Number 112

Photograph Direction SW

Comments:



Project/Site: Long Ridge Energy Terminal Project	City/County: Monroe Sampling Date: 07/17/19
Applicant/Owner: Long Ridge Energy Terminal, LLC	State: OH Sampling Point: W-KM4
	Section, Township, Range: N/A
	Local relief (concave, convex, none): Concave Slope (%): 0-3%
	33 Long: -80.838029 Datum: NAD 83
Soil Map Unit Name: Made Land	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of	
Are Vegetation, Soil, or Hydrology significa	,
Are Vegetation, Soil, or Hydrology naturall	
	ring sampling point locations, transects, important features, etc.
,	ing sampling point locations, transcets, important leatures, etc.
Hydrophytic Vegetation Present? Yes No	is the sampled Area
Hydric Soil Present? Yes ✓ No	— within a Wetland? Yes <u>√</u> No
Wetland Hydrology Present? Yes <u>√</u> No	
Remarks: Cowardin Code: PFO HGM: D	epressional Water Type: NRPWW
Wetland is already silt and construction fence	d off. Water from yard is entering wetland at west end and creating
ponding.	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that ap	
	tic Plants (B14) Sparsely Vegetated Concave Surface (B8)
	Sulfide Odor (C1) Drainage Patterns (B10)
	hizospheres on Living Roots (C3) Moss Trim Lines (B16)
	of Reduced Iron (C4) Dry-Season Water Table (C2)
	n Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
	Surface (C7) Saturation Visible on Aerial Imagery (C9)
	lain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	✓ FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes _ ✓ No Depth (inc	hes):2
Water Table Present? Yes _ ✓ No Depth (inc	thes): 0
Saturation Present? Yes Ves No Depth (inc	_
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial p	notos, previous inspections), ii available.
Remarks:	

VEGETATION (Four Strata) - Use scientific names of plants.

Sapling/Shrub Stratum (Plot size: 15')

2 Echinochloa crus-galli

5. Juncus canadensis

Woody Vine Stratum (Plot size: ____15'_____)

Tree Stratum (Plot size: _

Herb Stratum (Plot size: ___ 1. Typha latifolia

3. Juncus tenuis

4. Agrostis gigantea

7 Phleum pratense

6. Kyllinga gracillima

1. Nyssa sylvatica

___)

1. Nyssa sylvatica 45 ✓ FAC

6._____

) <u>% Cover</u> <u>Species? Statu</u>
35 ✓ FAC

50% of total cover: 17.5 20% of total cover: 7

50% of total cover: 22.5 20% of total cover: 9

50% of total cover: <u>42.5</u> 20% of total cover: <u>17</u>

50% of total cover: ____0 ___20% of total cover:

nes of	plants.		Sampling I	Poir	nt: <u>W-KM4</u>	
bsolute			Dominance Test worksheet	:		
% Cover 35	Species? ✓	<u>Status</u> FAC	Number of Dominant Species That Are OBL, FACW, or FAC		4	(A)
			Total Number of Dominant Species Across All Strata:	-	4	(B)
			Percent of Dominant Species That Are OBL, FACW, or FAC		100%	(A/B
			Prevalence Index workshee	t:		
35			Total % Cover of:		Multiply by:	
	= Total Cov	_			=	
_ 20 /6 01	total cover.		FACW species			
45	1	FAC	FAC species		=	
			· —	x 4	=	
			UPL species		=	_
			Column Totals:			_
			Prevalence Index = B/A	\ = _		_
			Hydrophytic Vegetation Ind	icato	ors:	
			1 - Rapid Test for Hydrop	hytic	Vegetation	
			✓ 2 - Dominance Test is >5	0%		
4.5			3 - Prevalence Index is ≤	3.0 ¹		
	= Total Cov	_	4 - Morphological Adapta	tions	1 (Provide sup	portin
_ 20% of	total cover		data in Remarks or on	ase	eparate sheet)	
15		OBL	Problematic Hydrophytic	Vege	etation¹ (Expla	in)
25	√	FACW_	1			
10 20		FAC FACW	¹ Indicators of hydric soil and we be present, unless disturbed of	vetia or pro	nd hydrology r oblematic.	nust
5			Definitions of Four Vegetati	on S	trata:	
5		FACU FACU	Tree – Woody plants, excludi	na vi	nes. 3 in. (7.6	cm) o
5		FACU	more in diameter at breast he height.			
			Sapling/Shrub – Woody plan than 3 in. DBH and greater th m) tall.			
85	= Total Cov		Herb – All herbaceous (non-wof size, and woody plants less			rdless
	total cover	4	Woody vine – All woody vine			ß ft in
			Hydrophytic Vegetation	,		
0	= Total Cov	_	Present? Yes <u>√</u>	_	No	
000/ .	total cover:	. 0				

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

Depth	cription: (Describe to Matrix	io inc depi		x Features	01 01 00111111	i the absence t	n maioate	,,,	
(inches)	Color (moist)	%	Color (moist)	%Туре	e ¹ Loc ²	Texture		Remarks	
<u>0-16</u>	10YR 3/2	35				GRSL			
	10YR 4/1	40_	7.5YR 5/6	10C	<u>M/PL</u>	GRSL_			
	10YR 4/3	15				GRSL			
1			Deduced Metric MC			21	D 1 i		
Type: C=Co	oncentration, D=Depl	letion, RM=	Reduced Matrix, MS	s=Masked Sand	Grains.	² Location: PL		ng, M=Matrix. roblematic Hy	dric Soils ³ ·
-			Dark Surface	(97)				A10) (MLRA 1 4	
Histosol Histic Er	oipedon (A2)		Dark Surface Polyvalue Be	elow Surface (S8)) (MLRA 147		•	Redox (A16)	- 11)
	stic (A3)			rface (S9) (MLR			(MLRA 14		
	en Sulfide (A4)			ed Matrix (F2)	. ,			oodplain Soils ((F19)
	d Layers (A5)		✓ Depleted Mat				(MLRA 13		
	ıck (A10) (LRR N)		Redox Dark S	` ,				Dark Surface	
	d Below Dark Surface	e (A11)		rk Surface (F7)		Ot	ner (Expla	in in Remarks)	
	ark Surface (A12) ⁄lucky Mineral (S1) (L	DD N	Redox Depre	essions (F8) ese Masses (F12	2) /I DD N				
	A 147, 148)	.KK N,	MLRA 13		Z) (LKK N,				
	Gleyed Matrix (S4)			ice (F13) (MLRA	136, 122)	³ Indic	cators of h	ydrophytic veg	etation and
	Redox (S5)			oodplain Soils (F´				logy must be p	
	Matrix (S6)		Red Parent N	//aterial (F21) (M	LRA 127, 147	') unle	ss disturb	ed or problema	atic.
Restrictive I	Layer (if observed):								
Type:								,	
Depth (in	ches):					Hydric Soil F	resent?	Yes <u>√</u>	No
Remarks:									

Wetland Photograph Page

Wetland ID W-KM4 Cowardin Code PFO Date 07/17/19



Photograph Number <u>113</u>
Photograph Direction North

Comments:



Photograph Number 114

Photograph Direction South

Comments:



Photograph Number 115

Photograph Direction SE

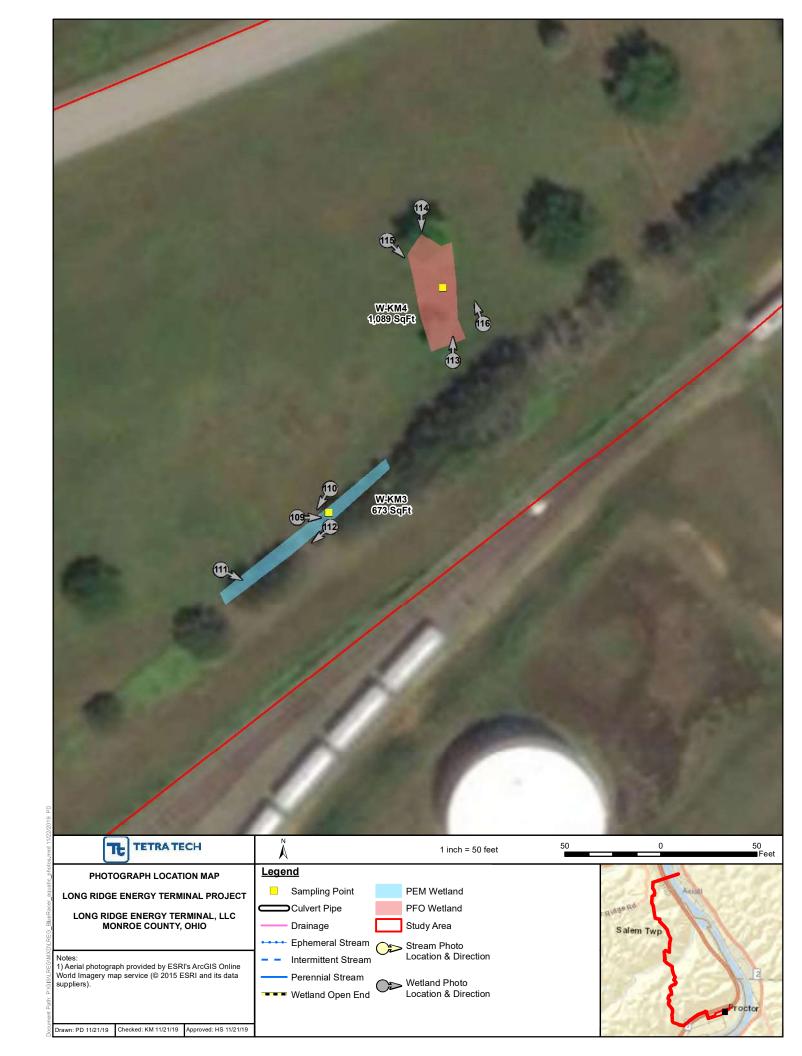
Comments:



Photograph Number 116
Photograph Direction NNW

Comments:

۶.			





Background Information

Name: Wyatt Jackson	
Date: 11/06/2019	
Affiliation: Tetra Tech	
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090	
e-mail address: wyatt.jackson@tetratech.com	
Name of Wetland: W-WJKM01	
Vegetation Communit(ies): PEM	
HGM Class(es): Slope	
Lat/Long or UTM Coordinate 39.745837, -80.871736	
USGS Quad Name	New Martinsville
County	Monroe
Township	Clarington
Section and Subsection	N/A
Hydrologic Unit Code	05030201
Site Visit	11/06/2019
National Wetland Inventory Map	Fig. 3a
Ohio Wetland Inventory Map	
Soil Survey	Fig. 3b
Delineation report/map Attached	Fig. 3b

Name of Wetland: W-WJKM01		
Wetland Size (acres, hectares): < 0.01		
	tc.	
Comments, Narrative Discussion, Justification of Category Changes:		
Very small wetland on side slope. Adjacent to soils disturbed by agricultural		
Final score: 13	ategory:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	1 Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.		
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	√	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

	To "	[a	Т
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	110
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this	YES	NO 🗸
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO 🗸
	prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or	Wetland should be	Go to Question 9c
	landward dikes or other hydrological controls?	evaluated for possible	Co to Question so
		Category 3 status	
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These	Go to Question 90	Go to Question to
	include sandbar deposition wetlands, estuarine wetlands, river mouth		
9d	wetlands, or those dominated by submersed aquatic vegetation. Does the wetland have a predominance of native species within its	YES	NO /
Ju	vegetation communities, although non-native or disturbance tolerant	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	native species can also be present?	Wetland is a Category	Go to Question 9e
		3 wetland	
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES	NO 🗸
	tolerant hauve plant species within its vegetation communities:	Wetland should be	Go to Question 10
		evaluated for possible	
		Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO 🗸
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within	3 wetland.	
	several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of	Oo to Question 11	
	Natural Areas and Preserves can provide assistance in confirming this		
11	type of wetland and its quality. Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
••	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union	Wetland should be	Complete
	Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	1

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W-WJKM	01 F	Rater(s): Wyatt Jackson		Date: 11/06/2019
0 0	Metric 1. Wetland Arc	ea (size).		
max 6 pts. subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2) 10 to <25 acres (4 to <10.1ha 3 to <10 acres (1.2 to <4ha) (0.3 to <3 acres (0.12 to <1.2ha) 0.1 to <0.3 acres (0.04 to <0.4)) (4 pts) 3 pts) a) (2pts)		
1 1	Metric 2. Upland buff	fers and surroundi	ng land use.	
max 14 pts. subtotal	MEDIUM. Buffers average 25 NARROW. Buffers average 25 VERY NARROW. Buffers average 25 VERY NARROW. Buffers average 25 VERY LOW. Buffers average 25 LOW. Old field (>10 years), s MODERATELY HIGH. Resid	(164ft) or more around wetland per 5m to <50m (82 to <164ft) around v 10m to <25m (32ft to <82ft) around erage <10m (<32ft) around wetland	rimeter (7) vetland perimeter (4) I wetland perimeter (1) I perimeter (0) erage. ife area, etc. (7) prest. (5) rvation tillage, new fallo	ow field. (3)
7 8	Metric 3. Hydrology.	r pastare, row cropping, mining, ec	ristraction. (1)	
max 30 pts. subtotal	3a. Sources of Water. Score all that ap High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface Perennial surface water (lake 3c. Maximum water depth. Select only >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2 <0.4m (<15.7in) (1) 3e. Modifications to natural hydrologic	water (3) or stream) (5) one and assign score.	Part of wetland/ul Part of riparian or Duration inundation/sate Semi- to permane Regularly inundat Seasonally inund V Seasonally satura	in (1) lake and other human use (1) pland (e.g. forest), complex (1) upland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) ted/saturated (3)
	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 (non filling/grading road bed/RR trac dredging other tilling	
3 11	Metric 4. Habitat Alte	eration and Develo	pment.	
max 20 pts. subtotal	4a. Substrate disturbance. Score one of None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only of Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2)	·		
	Poor (1) 4c. Habitat alteration. Score one or do			
11 subtotal this pa	·	Check all disturbances observed / mowing / grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling rem herbaceous/aqua sedimentation dredging farming nutrient enrichme	tic bed removal

Site: W	-WJKM	01	Rater(s):Wyatt J	ackson Date: 11/06/2019
	11 btotal first pa		(c),	
0	11	Metric 5. Special W	etlands.	
max 10 pts.	subtotal	Check all that apply and score as ind Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5 Lake Erie coastal/tributary Lake Erie coastal/tributary Lake Plain Sand Prairies (0 Relict Wet Prairies (10) Known occurrence state/fe Significant migratory songt Category 1 Wetland. See) wetland-unrestricted hydro wetland-restricted hydro Dak Openings) (10) deral threatened or enda bird/water fowl habitat or	angered species (10) usage (10)
2	13	Metric 6. Plant com	munities, int	erspersion, microtopography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communitie	s. Vegetation	Community Cover Scale
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
		Aquatic bed	1	Present and either comprises small part of wetland's
		<u>o</u> Emergent		vegetation and is of moderate quality, or comprises a
		o Shrub		significant part but is of low quality
		0 Forest	2	Present and either comprises significant part of wetland's
		0 Mudflats		vegetation and is of moderate quality or comprises a small
		Open water	3	part and is of high quality
		Other		Present and comprises significant part, or more, of wetland's
		6b. horizontal (plan view) Interspersi Select only one.	UII.	vegetation and is of high quality
		High (5)	Narrativo D	escription of Vegetation Quality
		Moderately high(4)	low	Low spp diversity and/or predominance of nonnative or
		Moderate (3)	IOW	disturbance tolerant native species
		Moderately low (2)	mod	Native spp are dominant component of the vegetation,
		✓ Low (1)		although nonnative and/or disturbance tolerant native spp
		None (0)		can also be present, and species diversity moderate to
		6c. Coverage of invasive plants. Re	fer	moderately high, but generally w/o presence of rare
		to Table 1 ORAM long form for list. A		threatened or endangered spp
		or deduct points for coverage	high	A predominance of native species, with nonnative spp
		Extensive >75% cover (-5)		and/or disturbance tolerant native spp absent or virtually
		Moderate 25-75% cover (-3	3)	absent, and high spp diversity and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
		Nearly absent <5% cover (,	
		✓ Absent (1)		d Open Water Class Quality
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
		Vegetated hummucks/tuss		Moderate 1 to <4ha (2.47 to 9.88 acres)
		Coarse woody debris >150		High 4ha (9.88 acres) or more
		Standing dead >25cm (10i	,	manha Osasa Osala
		Amphibian breeding pools		raphy Cover Scale
			0	Absent Propert year amall amounts or if more common
			1	Present very small amounts or if more common of marginal quality
			2	Present in moderate amounts, but not of highest
			۷	quality or in small amounts of highest quality
			3	Present in moderate or greater amounts
			J	and of highest quality
13				and of highest quality

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
•	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	7	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	2	-
	TOTAL SCORE		Category based on score breakpoints
		13	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, loca or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category					
Choose one	Category 1	Category 2	Category 3		
	1				

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Wyatt Jackson	
Date: 11/06/2019	
Affiliation: Tetra Tech	
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090	
e-mail address: wyatt.jackson@tetratech.com	
Name of Wetland: S-WJKM02	
Vegetation Communit(ies): PEM	
HGM Class(es): Riverine	
Attached.	
Lat/Long or UTM Coordinate 39.742506, -80.870912	
USGS Quad Name	New Martinsville
County	Monroe
Township	Salem
Section and Subsection	N/A
Hydrologic Unit Code	05030201
Site Visit	11/06/2019
National Wetland Inventory Map	Fig. 3a
Ohio Wetland Inventory Map	Fig. 3b
Soil Survey	Fig. 2
Delineation report/map Attached	

Name of Wetland: S-WJKM02		
Wetland Size (acres, hectares): <0.01		
Comments, Narrative Discussion, Justification of Category Changes:		
Final score: 53 Catego	ry:	2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

- и	T 0	Circle and	<u> </u>
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	Wetland should be evaluated for possible Category 3 status.	Go to Question 9a
		Co to Overtion On	
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at	Go to Question 9a	NO /
Ju	an elevation less than 575 feet on the USGS map, adjacent to this	120	No ✓
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO 🗸
	prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	Wetland should be evaluated for possible Category 3 status	Go to Question 9c
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	Go to Question 9d	Go to Question 10
9d	Does the wetland have a predominance of native species within its	YES	NO /
	vegetation communities, although non-native or disturbance tolerant native species can also be present?	Wetland is a Category 3 wetland	Go to Question 9e
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance	YES	NO 🗸
	tolerant native plant species within its vegetation communities?	Wetland should be evaluated for possible Category 3 status	Go to Question 10
-10		Go to Question 10	NO
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO ✓
	characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the	Wetland is a Category 3 wetland.	Go to Question 11
	gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	Go to Question 11	
11	Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
	dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	Wetland should be evaluated for possible Category 3 status Complete Quantitative	Complete Quantitative Rating
	,	Rating	

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		J
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: S-WJKM0	2 Ra	ı ter(s): Wyatt Jackson		Date: 11/06/2019
0 0	Metric 1. Wetland Area	a (size).		
max 6 pts. subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2h 10 to <25 acres (4 to <10.1ha) (3 to <10 acres (1.2 to <4ha) (3 pt) 0.3 to <3 acres (0.12 to <1.2ha) 0.1 to <0.3 acres (0.04 to <0.12 <0.1 acres (0.04ha) (0 pts)	4 pts) ots) (2pts)		
14 14	Metric 2. Upland buffe	rs and surroundi	ng land use.	
	2a. Calculate average buffer width. Selective WIDE. Buffers average 50m (1) MEDIUM. Buffers average 25m NARROW. Buffers average 10i VERY NARROW. Buffers average 2b. Intensity of surrounding land use. Selective VERY LOW. 2nd growth or old LOW. Old field (>10 years), shrund MODERATELY HIGH. Resider HIGH. Urban, industrial, open processing the surrounding land use.	64ft) or more around wetland pe to <50m (82 to <164ft) around wetland on to <25m (32ft to <82ft) around age <10m (<32ft) around wetland elect one or double check and aver forest, prairie, savannah, wildlub land, young second growth for tial, fenced pasture, park, conse	rimeter (7) wetland perimeter (4) d wetland perimeter (1) d perimeter (0) verage. ife area, etc. (7) prest. (5) ervation tillage, new fallo	w field. (3)
20 34	Metric 3. Hydrology.	, , , , , ,	()	
	Ba. Sources of Water. Score all that appl High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface w Perennial surface water (lake or or or or (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2) < 0.4m (<15.7in) (1) Be. Modifications to natural hydrologic recovery for the property of the property	ater (3) stream) (5) 3d. ne and assign score.	Part of wetland/ul Part of riparian or Duration inundation/sate Semi- to permane Regularly inundat Seasonally inund V Seasonally satura	in (1) ake and other human use (1) pland (e.g. forest), complex (1) upland corridor (1) uration. Score one or dbl check ently inundated/saturated (4) red/saturated (3)
	Recovered (7) Recovering (3) Recent or no recovery (1)	ditch tile dike weir stormwater input	point source (non filling/grading road bed/RR trac dredging other	·
16 50	Metric 4. Habitat Alter	ation and Develo	pment.	
	4a. Substrate disturbance. Score one or None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only one Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1)	•		
	4c. Habitat alteration. Score one or doub			
50 subtotal this pag last revised 1 February	Recovered (6) Recovering (3) Recent or no recovery (1)	heck all disturbances observed mowing grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling ren herbaceous/aqua sedimentation dredging farming nutrient enrichme	tic bed removal

Site: S	-WJKM(D2 Rater	(s):Wyatt Ja	ackson	Date: 11/06/2019
su	50 btotal first pa	ge			
0	50	Metric 5. Special Wetlan	ds.		
max 10 pts.	subtotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland-Lake Erie coastal/tributary wetland-Lake Plain Sand Prairies (Oak Open Relict Wet Prairies (10) Known occurrence state/federal thre Significant migratory songbird/water Category 1 Wetland. See Question	estricted hydro lings) (10) atened or enda fowl habitat or 1 Qualitative R	logy (5) angered species (10) usage (10) ating (-10)	
3	53	Metric 6. Plant commun	ities, int	erspersion, microto	pography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.	Vegetation	Community Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	471 acres) contiguous area
		Aquatic bed	1	Present and either comprises sm	**
		o Emergent Emergent		vegetation and is of moderate of	
		Shrub		significant part but is of low qua	
		0 Forest	2	Present and either comprises sign	
		Mudflats		vegetation and is of moderate of	luality or comprises a small
		Open water		part and is of high quality	
		Other	3	Present and comprises significan	
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality	<u>'</u>
		Select only one.	Name time B		
		High (5)		escription of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predomi	
		Moderate (3)	mod	disturbance tolerant native spec	
		Moderately low (2)	mod	Native spp are dominant compon	
		/ Low (1)		although nonnative and/or distu	
		None (0) 6c. Coverage of invasive plants. Refer			•
		to Table 1 ORAM long form for list. Add		moderately high, but generally threatened or endangered spp	wo presence of rare
		or deduct points for coverage	high	A predominance of native species	s with nonnative son
		Extensive >75% cover (-5)	iligii	and/or disturbance tolerant nation	· · · · · · · · · · · · · · · · · · ·
		Moderate 25-75% cover (-3)		absent, and high spp diversity a	• •
		Sparse 5-25% cover (-1)		the presence of rare, threatened	
		Nearly absent <5% cover (0)		The processes of fare, an eatened	a, or chadingered opp
		Absent (1)	Mudflat and	d Open Water Class Quality	
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 ac	cres)
		Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88	
		1 Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more	
		o Standing dead >25cm (10in) dbh		Triight ma (clea derec) et mere	
		Amphibian breeding pools	Microtopoa	raphy Cover Scale	
			0	Absent	
			1	Present very small amounts or if	more common
			•	of marginal quality	
			2	Present in moderate amounts, bu	t not of highest
			_	quality or in small amounts of h	
			3	Present in moderate or greater ar	
			-	and of highest quality	·
53			-	1	

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	14	
	Metric 3. Hydrology	20	
	Metric 4. Habitat	16	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE		Category based on score breakpoints
		53	2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category			
Choose one	Category 1	Category 2	Category 3
		✓	

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

_	
Name: Wyatt Jackson	
Date: 11/08/2019	
Affiliation: Tetra Tech	
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090	
e-mail address: wyatt.jackson@tetratech.com	
Name of Wetland: W-WJKM03	
Vegetation Communit(ies):	
HGM Class(es):	
Slope	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. Attached.	
Lat/Long or UTM Coordinate 39.726499, -80.865057	
USGS Quad Name	New Martinsville
County	Monroe
Township	Salem
Section and Subsection	N/A
Hydrologic Unit Code	05030201
Site Visit	11/08/2019
National Wetland Inventory Map	Fig. 3a
Ohio Wetland Inventory Map	Fig. 3b
Soil Survey	Fig. 2
Delineation report/map Attached	

Name of Wetland: W-WJKM03		
Wetland Size (acres, hectares): 0.02		
Sketch: Include north arrow, relationship with other surface waters, vegetation zone	s, etc.	
See Attached.		
Comments, Narrative Discussion, Justification of Category Changes:		
Comments, Narrative Discussion, Justinication of Category Changes.		
Final score: 12	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	√	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	√	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

.,	Tout		Г
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	110
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this	YES	NO 🗸
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO 🗸
	prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or	Wetland should be	Go to Question 9c
	landward dikes or other hydrological controls?	evaluated for possible	Co to Question so
		Category 3 status	
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These	Go to Question 90	Go to Question to
	include sandbar deposition wetlands, estuarine wetlands, river mouth		
9d	wetlands, or those dominated by submersed aquatic vegetation. Does the wetland have a predominance of native species within its	YES	NO /
Ju	vegetation communities, although non-native or disturbance tolerant	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	native species can also be present?	Wetland is a Category	Go to Question 9e
		3 wetland	
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES	NO 🗸
	tolerant hauve plant species within its vegetation communities:	Wetland should be	Go to Question 10
		evaluated for possible	
		Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO 🗸
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within	3 wetland.	
	several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of	Oo to Question 11	
	Natural Areas and Preserves can provide assistance in confirming this		
11	type of wetland and its quality. Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
••	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union	Wetland should be	Complete
	Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	1

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W	-WJKM	03 Rater(s): Wyatt Jackson	Date: 11/08/2019
0	0	Metric 1. Wetland Area (size).	
max 6 pts.	subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) (5 pts) 10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts) 0.3 to <3 acres (0.12 to <1.2ha) (2pts) 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt) <0.1 acres (0.04ha) (0 pts)	
1	1	Metric 2. Upland buffers and surrounding land use.	
max 14 pts.	subtotal	2a. Calculate average buffer width. Select only one and assign score. Do not double check. WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4) NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) 2b. Intensity of surrounding land use. Select one or double check and average. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5) MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallows.	
10	11	Metric 3. Hydrology.	
max 30 pts.	subtotal	Precipitation (1) Seasonal/Intermittent surface water (3) Perennial surface water (lake or stream) (5) 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) Part of wetland/u Duration inundation/sat Semi- to perman Regularly inunda Seasonally inunda	ain (1) /lake and other human use (1) upland (e.g. forest), complex (1) upland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) uted/saturated (3)
		None or none apparent (12) Recovered (7) Recovering (3) ✓ Recent or no recovery (1) Check all disturbances observed ☐ ditch ☐ tile ☐ filling/grading ☐ road bed/RR trace ☐ weir ☐ weir ☐ stormwater input ☐ other	
3	14	Metric 4. Habitat Alteration and Development.	
max 20 pts.	subtotal	4a. Substrate disturbance. Score one or double check and average. 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) Fair (3) Poor to fair (2)	
		Poor (1) 4c. Habitat alteration. Score one or double check and average.	
	14 btotal this pa	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recent or no recovery (1)	atic bed removal
last revised	1 Februa	ry 2001 jjm	

Site: W	/-W.IKM	n3 R	ater(s):Wyatt Ja	ackson	Date: 11/08/2019
Oito. W	VVOICIVI	11	ator(3). Wyak oc	1010011	Date: 11/00/2010
	4.4				
	14				
su	btotal first pa	ge			
0	14	Metric 5. Special We	tlands.		
max 10 pts.	subtotal	Check all that apply and score as indica	ted.		
		Bog (10)			
		Fen (10) Old growth forest (10)			
		Mature forested wetland (5)			
		Lake Erie coastal/tributary we	tland-unrestricted hyd	rology (10)	
		Lake Erie coastal/tributary we	•	ogy (5)	
		Lake Plain Sand Prairies (Oa	k Openings) (10)		
		Relict Wet Prairies (10) Known occurrence state/fede	ral threatened or enda	ngered species (10)	
		Significant migratory songbird		• , ,	
		Category 1 Wetland. See Qu	estion 1 Qualitative Ra	ating (-10)	
_	40	Metric 6. Plant comn	nunities, inte	erspersion, microto	pography.
-2	12		,	, , , , , , , , , , , , , , , , , , , ,	1-5-1-5
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.	Vegetation (Community Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	
		Aquatic bedEmergent	1	Present and either comprises small vegetation and is of moderate quality	•
		o Shrub		significant part but is of low qual	-
		o Forest	2	Present and either comprises sign	•
		0 Mudflats		vegetation and is of moderate q	uality or comprises a small
		Open water	3	part and is of high quality	
		6b. horizontal (plan view) Interspersion	-	Present and comprises significant vegetation and is of high quality	part, or more, or wetland's
		Select only one.		vogotation and to or might quality	
		High (5)	Narrative De	escription of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predomir	
		Moderate (3) Moderately low (2)	mod	Native spp are dominant component	
		✓ Low (1)	mod	although nonnative and/or distu	<u> </u>
		None (0)		can also be present, and specie	• • • • • • • • • • • • • • • • • • • •
		6c. Coverage of invasive plants. Refer		moderately high, but generally w	/o presence of rare
		to Table 1 ORAM long form for list. Add or deduct points for coverage	high	threatened or endangered spp A predominance of native species	with nonnative snn
		Extensive >75% cover (-5)	riigii	and/or disturbance tolerant nativ	
		✓ Moderate 25-75% cover (-3)		absent, and high spp diversity a	nd often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened	l, or endangered spp
		Nearly absent <5% cover (0) Absent (1)	Mudflat and	Open Water Class Quality	
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 ac	res)
		0 Vegetated hummucks/tussuc		Moderate 1 to <4ha (2.47 to 9.88	acres)
		Coarse woody debris >15cm Standing dead >25cm (10in)		High 4ha (9.88 acres) or more	
		Standing dead >25cm (10in)Amphibian breeding pools		raphy Cover Scale	
			0	Absent	
			1	Present very small amounts or if n	nore common
			2	of marginal quality	not of highest
			Z	Present in moderate amounts, but quality or in small amounts of high	
			3	Present in moderate or greater an	
4.5	,			and of highest quality	
12					_

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
J	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	10	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	-2	-
	TOTAL SCORE		Category based on score breakpoints
		12	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, loca or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category			
Choose one	Category 1	Category 2	Category 3
	1		

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Wyatt Jackson		
Date: 11/08/2019		
Affiliation: Tetra Tech		
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh,	PA 15220	
Phone Number: (412) 921-7090		
e-mail address: wyatt.jackson@tetratech.com		
Name of Wetland: _{W-WJKM04}		
Vegetation Communit(ies):		
HGM Class(es): Depressional		
Location of Wetland: include map, address, north arrow, landmark Attached.	is, distances, roads, etc.	
Lat/Long or UTM Coordinate	20 725620 00 065207	
	39.725628, -80.865287	
USGS Quad Name		New Martinsville
County		Monroe
Township		Salem
Section and Subsection		N/A
Hydrologic Unit Code		05030201
Site Visit		11/08/19
National Wetland Inventory Map		Fig. 3a
Ohio Wetland Inventory Map		Fig. 3b
Soil Survey		Fig. 2
Delineation report/map Attached		ļ

Name of Wetland: W-WJKM04	
Wetland Size (acres, hectares): 0.07	
Wetland Size (acres, hectares): 0.07 Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See Attached.	
Comments, Narrative Discussion, Justification of Category Changes:	
Wetland W-WJKM04 consists of two separate polygons of wetland separated by distu	
Final score : 12 Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	√	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	√	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

- и	T 0	Circle and	<u> </u>
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at	YES	NO 🗸
	an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO /
	prevent erosion and the loss of aquatic plants, i.e. the wetland is	Maria de la collaba	V On the Owner than On
	partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	Wetland should be evaluated for possible	Go to Question 9c
	landward alkee of other hydrological controls.	Category 3 status	
9c	Are Lake Erie water levels the wetland's primary hydrological influence,	Go to Question 10 YES	NO ,
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland	3	✓
	border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth		
	wetlands, or those dominated by submersed aquatic vegetation.		
9d	Does the wetland have a predominance of native species within its	YES	NO 🗸
	vegetation communities, although non-native or disturbance tolerant native species can also be present?	Wetland is a Category	Go to Question 9e
	native species can also be present:	3 wetland	Go to Question se
9e	Does the wetland have a predominance of non-native or disturbance	Go to Question 10 YES	NO /
•	tolerant native plant species within its vegetation communities?		✓
		Wetland should be	Go to Question 10
		evaluated for possible Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO ✓
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the	3 wetland.	
	gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of		
	Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.		
11	Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion	Wetland should be	Complete
	Counties), Sandusky Plains (vvyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		J
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W-WJKM04		Rater(s): Wyatt Jackson		Date: 11/08/2019
0 0	Metric 1. Wetland A	rea (size).		
max 6 pts. subtotal	Select one size class and assign scores (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <2 10 to <25 acres (4 to <10.1 3 to <10 acres (1.2 to <4ha 0.3 to <3 acres (0.12 to <1. 0.1 to <0.3 acres (0.04 to < <0.1 acres (0.04ha) (0 pts)	0.2ha) (5 pts) ha) (4 pts)) (3 pts) 2ha) (2pts)		
1 1	Metric 2. Upland bu	ffers and surroundi	ng land use.	
max 14 pts. subtotal	MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers average VERY LOW. 2nd growth of LOW. Old field (>10 years) MODERATELY HIGH. Res	m (164ft) or more around wetland pe 25m to <50m (82 to <164ft) around ve e 10m to <25m (32ft to <82ft) around average <10m (<32ft) around wetland	rimeter (7) wetland perimeter (4) d wetland perimeter (1) d perimeter (0) verage. ife area, etc. (7) prest. (5) ervation tillage, new fallo	ow field. (3)
10 11	Metric 3. Hydrology		()	
max 30 pts. subtotal	3a. Sources of Water. Score all that High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surfa Perennial surface water (Ial 3c. Maximum water depth. Select or >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) V <0.4m (<15.7in) (1) 3e. Modifications to natural hydrologi None or none apparent (12 Recovered (7) Recovering (3) Recent or no recovery (1)	ce water (3) ke or stream) (5) 3d. ily one and assign score. (2) c regime. Score one or double chec Check all disturbances observed ditch tile dike weir	Part of wetland/u Part of riparian or Duration inundation/sate Semi- to permane Regularly inundat Seasonally inund	ain (1) lake and other human use (1) pland (e.g. forest), complex (1) r upland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) ted/saturated (3) lated (2) ated in upper 30cm (12in) (1)
3 14	Metric 4. Habitat Al	teration and Develo		
max 20 pts. subtotal	4a. Substrate disturbance. Score on None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select only Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2)			
	Poor (1) 4c. Habitat alteration. Score one or or one apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)	Check all disturbances observed mowing grazing clearcutting selective cutting	shrub/sapling ren herbaceous/aqua sedimentation dredging	
subtotal this part revised 1 February	•	woody debris removal toxic pollutants	farming nutrient enrichme	ent
last revised 1 Februa	ıy ∠∪∪ i jjili			

Site: W	/-WJKM	04 Rate	r(s):Wyatt J	ackson Date: 11/08/2019
su	14 btotal first pa	ige		·
0	14	Metric 5. Special Wetlar	nds.	
max 10 pts.	subtotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland- Lake Erie coastal/tributary wetland- Lake Plain Sand Prairies (Oak Ope Relict Wet Prairies (10) Known occurrence state/federal thr Significant migratory songbird/wate Category 1 Wetland. See Question	restricted hydro nings) (10) eatened or end r fowl habitat or n 1 Qualitative F	angered species (10) susage (10) Rating (-10)
- 2	12	Metric 6. Plant commun	ities, int	erspersion, microtopography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.	<u>Veget</u> ation	Community Cover Scale
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
		0 Aquatic bed	1	Present and either comprises small part of wetland's
		○ Emergent		vegetation and is of moderate quality, or comprises a
		O Shrub O Forest	2	significant part but is of low quality Present and either comprises significant part of wetland's
		Forest Mudflats	2	vegetation and is of moderate quality or comprises a small
		0 Open water		part and is of high quality
		Other	3	Present and comprises significant part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.	Ŭ	vegetation and is of high quality
		Select only one.	-	vogotation and to or riigh quality
		High (5)	Narrative D	escription of Vegetation Quality
		Moderately high(4)	low	Low spp diversity and/or predominance of nonnative or
		Moderate (3)		disturbance tolerant native species
		Moderately low (2)	mod	Native spp are dominant component of the vegetation,
		Low (1)		although nonnative and/or disturbance tolerant native spp
		None (0)		can also be present, and species diversity moderate to
		6c. Coverage of invasive plants. Refer		moderately high, but generally w/o presence of rare
		to Table 1 ORAM long form for list. Add		threatened or endangered spp
		or deduct points for coverage	high	A predominance of native species, with nonnative spp
		Extensive >75% cover (-5)		and/or disturbance tolerant native spp absent or virtually
		Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
		Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
		Nearly absent <5% cover (0)	Mudfleten	d Onen Water Class Custitu
		Absent (1) 6d. Microtopography.	0	d Open Water Class Quality Absent <0.1ha (0.247 acres)
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
		Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)
		O Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more
		o Standing dead >25cm (10in) dbh		Thigh the (close doles) of there
		Amphibian breeding pools	Microtopoo	graphy Cover Scale
			0	Absent
			1	Present very small amounts or if more common
				of marginal quality
			2	Present in moderate amounts, but not of highest
				quality or in small amounts of highest quality
			3	Present in moderate or greater amounts
				and of highest quality
12				_

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	10	
	Metric 4. Habitat	3	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	-2	
	TOTAL SCORE		Category based on score breakpoints
		12	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO 🗸	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category				
Choose one	Category 1	Category 2	Category 3	
	√			

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Wyatt Jackson	
Date: 11/08/2019	
Affiliation: Tetra Tech	
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090	
e-mail address: wyatt.jackson@tetratech.com	
Name of Wetland: W-WJKM05	
Vegetation Communit(ies): PEM PFO	
HGM Class(es): Depressional	
	6, -80.864803
USGS Quad Name	New Martinsville
County	Monroe
Township	Salem
Section and Subsection	N/A
Hydrologic Unit Code	05030201
Site Visit	11/08/2019
National Wetland Inventory Map	Fig. 3a
Ohio Wetland Inventory Map	Fig. 3b
Soil Survey	Fig. 2
Delineation report/map Attached	

Name of Wetland: W-WJKM05		
Wetland Size (acres, hectares): 0.55		
	s, etc.	
Comments, Narrative Discussion, Justification of Category Changes: W-WJKM05 is a PFO/PEM wetland complex situated on historically strip r functioned at one point as slurry impoundment land.		
Final score: 23	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

- и	T 0	[O:I	
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at	YES	NO 🗸
	an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO /
	prevent erosion and the loss of aquatic plants, i.e. the wetland is	Maria de la collaba	V On the Owner than On
	partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	Wetland should be evaluated for possible	Go to Question 9c
	landward alkee of other hydrological controls.	Category 3 status	
9c	Are Lake Erie water levels the wetland's primary hydrological influence,	Go to Question 10 YES	NO ,
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland	3	✓
	border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth		
	wetlands, or those dominated by submersed aquatic vegetation.		
9d	Does the wetland have a predominance of native species within its	YES	NO 🗸
	vegetation communities, although non-native or disturbance tolerant native species can also be present?	Wetland is a Category	Go to Question 9e
	native species can also be present:	3 wetland	Go to Question se
9e	Does the wetland have a predominance of non-native or disturbance	Go to Question 10 YES	NO /
•	tolerant native plant species within its vegetation communities?		✓
		Wetland should be	Go to Question 10
		evaluated for possible Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO ✓
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within	3 wetland.	
	several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of		
	Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.		
11	Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion	Wetland should be	Complete
	Counties), Sandusky Plains (vvyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		J
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W-WJKM	05 Rater(s): Wyatt Jackson	Date: 11/08/2019
2 2	Metric 1. Wetland Area (size).	
max 6 pts. subtotal	Select one size class and assign score.	
3 5	Metric 2. Upland buffers and surrounding land	use.
max 14 pts. subtotal	2a. Calculate average buffer width. Select only one and assign score. Do not double che WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (0) VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) Intensity of surrounding land use. Select one or double check and average. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5) MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, residential, upon pasture, row cropping, mining, construction. (1)	ter (4) leter (1)
10 15	Metric 3. Hydrology.	
max 30 pts. subtotal	Other groundwater (3) Precipitation (1) Part of we part of right perennial surface water (13) Perennial surface water (13) Perennial surface water (13) Perennial surface water (13) Part of right part of right perennial surface water (148e or stream) (5) 3d. Duration inunder Semi- to part of right perennial surface water (148e or stream) (5) 3d. Duration inunder Semi- to part of right perennial surface water (13) Part of right part of right part of right perennial surface water (13) Part of right par	focore all that apply. floodplain (1) stream/lake and other human use (1) etland/upland (e.g. forest), complex (1) parian or upland corridor (1) ation/saturation. Score one or dbl check. permanently inundated/saturated (4) y inundated/saturated (3) lly inundated (2) lly saturated in upper 30cm (12in) (1)
	Recovering (3) tile filling/gra	/RR track
4 19	Metric 4. Habitat Alteration and Development.	
max 20 pts. subtotal	4a. Substrate disturbance. Score one or double check and average. 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) Fair (3) Poor to fair (2)	
	Poor (1) 4c. Habitat alteration. Score one or double check and average.	
19 subtotal this pa	Recovering (3) Recent or no recovery (1)	pling removal bus/aquatic bed removal ation

Site: W	/-WJKM	05 Ra	ter(s):Wyatt Ja	ackson	Date: 11/08/2019
su	19 btotal first pa	ge			
0	19	Metric 5. Special Wet	lands.		
max 10 pts.	subtotal	Check all that apply and score as indicated Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland Lake Erie coastal/tributary wetland Lake Plain Sand Prairies (Oak of Relict Wet Prairies (10) Known occurrence state/federated Significant migratory songbird/venture Category 1 Wetland. See Question	and-unrestricted hydro and-restricted hydro Openings) (10) I threatened or enda vater fowl habitat or stion 1 Qualitative R	angered species (10) usage (10) ating (-10)	
4	23	Metric 6. Plant comm	unities, int	erspersion, microto	pography.
max 20 pts.	subtotal	l 6a. Wetland Vegetation Communities.	Vegetation	Community Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	71 acres) contiguous area
		Aquatic bed	1	Present and either comprises sma	
		Emergent		vegetation and is of moderate q	uality, or comprises a
		o Shrub		significant part but is of low qual	lity
		1 Forest	2	Present and either comprises sign	ificant part of wetland's
		Mudflats		vegetation and is of moderate q	uality or comprises a small
		Open water		part and is of high quality	
		Other	3	Present and comprises significant	part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality	
		Select only one.			
		High (5)	Narrative D	escription of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predomin	nance of nonnative or
		Moderate (3)		disturbance tolerant native spec	
		✓ Moderately low (2)	mod	Native spp are dominant compone	
		Low (1)		although nonnative and/or distu	- · · · · · · · · · · · · · · · · · · ·
		None (0)		can also be present, and specie	
		6c. Coverage of invasive plants. Refer		moderately high, but generally v	•
		to Table 1 ORAM long form for list. Add		threatened or endangered spp	no processes or rare
		or deduct points for coverage	high	A predominance of native species	with nonnative spp
		Extensive >75% cover (-5)	3	and/or disturbance tolerant nativ	• • •
		Moderate 25-75% cover (-3)		absent, and high spp diversity a	'''
		Sparse 5-25% cover (-1)		the presence of rare, threatened	
		Nearly absent <5% cover (0)	-		, cr changered opp
		✓ Absent (1)	Mudflat and	l Open Water Class Quality	
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 ac	res)
		Vegetated hummucks/tussucks		Moderate 1 to <4ha (2.47 to 9.88	
		O Coarse woody debris >15cm (6		High 4ha (9.88 acres) or more	<u> </u>
		o Standing dead >25cm (10in) db		jingni ma (elee aeree) er mere	
		Amphibian breeding pools		raphy Cover Scale	
			0	Absent	
			1	Present very small amounts or if r	nore common
			•	of marginal quality	
			2	Present in moderate amounts, but	not of highest
			~	quality or in small amounts of hi	
			3	Present in moderate or greater an	
			3	and of highest quality	Tourito
23				and of highest quality	

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	10	
	Metric 4. Habitat	4	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE		Category based on score breakpoints
		23	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category				
Choose one	Category 1	Category 2	Category 3	
	√			

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Wyatt Jackson		
Date: 11/08/2019		
Affiliation: Tetra Tech		
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh	, PA 15220	
Phone Number: (412) 921-7090		
e-mail address: wyatt.jackson@tetratech.com		
Name of Wetland: W-WJKM06		
Vegetation Communit(ies):		
HGM Class(es): Slope		
Lat/Long or UTM Coordinate	39.723532, -80.861922	
USGS Quad Name		New Martinsville
County		Monroe
Township		Salem
Section and Subsection		N/A
Hydrologic Unit Code		05030201
Site Visit		11/08/2019
National Wetland Inventory Map		Fig. 3a
Ohio Wetland Inventory Map		Fig. 3b
Soil Survey		Fig. 2
Delineation report/map Attached		

Name of Wetland: W-WJKM06		
Wetland Size (acres, hectares): 0.01		
Sketch: Include north arrow, relationship with other surface waters, vegetation zone	s, etc.	
See Attached.		
Comments, Narrative Discussion, Justification of Category Changes:		
P'and an are	0-1	
Final score: 17	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	√	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

.,	Tout		Г
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	110
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this	YES	NO 🗸
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO 🗸
	prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or	Wetland should be	Go to Question 9c
	landward dikes or other hydrological controls?	evaluated for possible	Co to Question so
		Category 3 status	
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These	Go to Question 90	Go to Question to
	include sandbar deposition wetlands, estuarine wetlands, river mouth		
9d	wetlands, or those dominated by submersed aquatic vegetation. Does the wetland have a predominance of native species within its	YES	NO /
Ju	vegetation communities, although non-native or disturbance tolerant	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	native species can also be present?	Wetland is a Category	Go to Question 9e
		3 wetland	
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES	NO 🗸
	tolerant hauve plant species within its vegetation communities:	Wetland should be	Go to Question 10
		evaluated for possible	
		Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO 🗸
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within	3 wetland.	
	several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of	Oo to Question 11	
	Natural Areas and Preserves can provide assistance in confirming this		
11	type of wetland and its quality. Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
••	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union	Wetland should be	Complete
	Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	1

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W-WJKM06		Rater(s): Wyatt Jackson		Date: 11/08/2019
0 0	Metric 1. Wetland A	rea (size).		
max 6 pts. subto	Select one size class and assign sco >50 acres (>20.2ha) (6 pts 25 to <50 acres (10.1 to <2 10 to <25 acres (4 to <10.1 3 to <10 acres (1.2 to <4ha 0.3 to <3 acres (0.12 to <1 0.1 to <0.3 acres (0.04 to <) (0.2ha) (5 pts) ha) (4 pts) ı) (3 pts) (2ha) (2pts) (0.12ha) (1 pt)		
3 3	Metric 2. Upland bu	ffers and surroundi	ing land use.	
max 14 pts. subto	WIDE. Buffers average 50 MEDIUM. Buffers average NARROW. Buffers average VERY NARROW. Buffers 2b. Intensity of surrounding land use VERY LOW. 2nd growth o LOW. Old field (>10 years MODERATELY HIGH. Re	m (164ft) or more around wetland pe 25m to <50m (82 to <164ft) around e 10m to <25m (32ft to <82ft) aroun average <10m (<32ft) around wetlan	erimeter (7) wetland perimeter (4) d wetland perimeter (1) d perimeter (0) verage. llife area, etc. (7) forest. (5) ervation tillage, new fallo	ow field. (3)
7 10	Motric 2 Hydrology		. ,	
max 30 pts. subto	3a. Sources of Water. Score all that High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surfa Perennial surface water (la 3c. Maximum water depth. Select or >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) 3e. Modifications to natural hydrolog None or none apparent (12 Recovered (7) Recovering (3) Recent or no recovery (1)	ce water (3) ke or stream) (5) 3d. nly one and assign score. (2) Check all disturbances observed ditch tile dike	Part of wetland/u Part of riparian or Duration inundation/sate Semi- to permand Regularly inundation Seasonally inundation Seasonally saturation And average. point source (non filling/grading road bed/RR trace	sin (1) lake and other human use (1) pland (e.g. forest), complex (1) r upland corridor (1) uration. Score one or dbl check ently inundated/saturated (4) ted/saturated (3) lated (2) ated in upper 30cm (12in) (1)
	¬	weir stormwater input	dredging other	
5 15		teration and Develo	pment.	
max 20 pts. subto	4a. Substrate disturbance. Score or None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) 4b. Habitat development. Select onl Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1)	*		
	4c. Habitat alteration. Score one or None or none apparent (9)			
15 subtotal th	Recovered (6) Recovering (3) Recent or no recovery (1)	mowing grazing clearcutting selective cutting woody debris removal toxic pollutants	shrub/sapling ren herbaceous/aqua sedimentation dredging farming nutrient enrichme	atic bed removal
last revised 1 Feb	uary 2001 jjiii			

Site: W	-WJKM	06	Rater(s):Wyatt	Jackson	Date: 11/08/2019
			110101(0)111)		
	45				
	15				
su	btotal first pa	ge			
0	15	Metric 5. Special	Wetlands.		
max 10 pts.	subtotal	Lake Erie coastal/tribut Lake Plain Sand Prairie Relict Wet Prairies (10) Known occurrence stat Significant migratory so	d (5) ary wetland-unrestricted hary wetland-restricted hydes (Oak Openings) (10) e/federal threatened or erongbird/water fowl habitat	ndangered species (10) or usage (10)	
0	47		ee Question 1 Qualitative	Rating (-10) Iterspersion, microto	opography.
2	17		,	, , ,	- 1 · 3 · 1 · 3
max 20 pts.	subtotal	6a. Wetland Vegetation Commur	nities. Vegetatio	on Community Cover Scale	
		Score all present using 0 to 3 sca		Absent or comprises <0.1ha (0.2	
		o Aquatic bed	1	Present and either comprises sm	•
		o Emergent		vegetation and is of moderate of	
		o Shrub		significant part but is of low qua	-
		0 Forest	2	Present and either comprises sig	
		Mudflats Open water		vegetation and is of moderate of	quality of comprises a small
		Open waterOther	3	part and is of high quality Present and comprises significan	t part or more of wetland's
		6b. horizontal (plan view) Intersp		vegetation and is of high quality	
		Select only one.		vegetation and is of high quality	/
		High (5)	Narrative	Description of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predom	inance of nonnative or
		Moderate (3)		disturbance tolerant native spe	
		Moderately low (2)	mod	Native spp are dominant compon	
		✓ Low (1)		although nonnative and/or distu	•
		None (0)		can also be present, and specie	
		6c. Coverage of invasive plants.	Refer	moderately high, but generally	w/o presence of rare
		to Table 1 ORAM long form for lis	t. Add	threatened or endangered spp	
		or deduct points for coverage	high	A predominance of native specie	s, with nonnative spp
		Extensive >75% cover	` '	and/or disturbance tolerant nati	
		Moderate 25-75% cove		absent, and high spp diversity a	•
		Sparse 5-25% cover (-		the presence of rare, threatene	d, or endangered spp
		Nearly absent <5% cov Absent (1)		nd Open Water Class Quality	
		Absent (1) 6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 sca		Low 0.1 to <1ha (0.247 acres)	cres)
		Vegetated hummucks/t		Moderate 1 to <4ha (2.47 to 9.88	
		Coarse woody debris >		High 4ha (9.88 acres) or more	, acros,
		Standing dead >25cm (. (. ,	i ng (evec accept a mere	
		Amphibian breeding po	'	ography Cover Scale	
			0	Absent	
			1	Present very small amounts or if	more common
				of marginal quality	
			2	Present in moderate amounts, bu	
				quality or in small amounts of h	
	ı		3	Present in moderate or greater a	mounts
4-				and of highest quality	
17					

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
•	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	7	
	Metric 4. Habitat	5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	2	-
	TOTAL SCORE		Category based on score breakpoints
		17	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, loca or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category						
Choose one	Category 1	Category 2	Category 3			
	1					

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Kevin Pulver							
Date: 11/11/2019							
Affiliation: Tetra Tech							
Address: 661 Andersen I	Orive, Fo	oster Plaza	7, Pittsbı	urgh, PA 1	15220		
Phone Number: (412) 921	-7090						
e-mail address:		atech.com					
Name of Wetland:			 <p01-pf0< td=""><td>). W-KP0</td><td>2. W-KP03.</td><td>W-KP04</td><td></td></p01-pf0<>). W-KP0	2. W-KP03.	W-KP04	
Vegetation Communit(ies):	PEM	PFO	PEM	PEM	PEM		
HGM Class(es):		Riverine		Slope	Slo	ne	Slope
Location of Wetland: include	le map, a					•	0.000
Attached.							
Lat/Long or UTM Coordinate							
USGS Quad Name	39.72132	. <u>5, -00.001120</u>	3, VV-NPU3 -	<u>39.723063,</u>	-60.661765, V	V-KP04 - 39.7228	New Martinsville
County							Monroe
Township							Salem
Section and Subsection							N/A
Hydrologic Unit Code							05030201
Site Visit							11/11/2019
National Wetland Inventory N	lap						Fig. 3a
Ohio Wetland Inventory Map							Fig. 3b
Soil Survey							Fig. 2
Delineation report/map Attac	ched		-				

Name of Wetland: W-KP01-PEM, W-KP01-PFO, W-KP02, W-KP03, W-KP04	
Wetland Size (acres, hectares): 1.18 ac.	
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.	
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See Attached.	
Comments, Narrative Discussion, Justification of Category Changes:	
	in main and ONIV
W-KP01 is a PFO/PEM wetland complex; W-KP01 - W-KP04 are situated on historically stri	p minea CNX
property.	
Final score: 29 Category: 1	

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

.,	Tout		Г
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	110
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this	YES	NO 🗸
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO 🗸
	prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or	Wetland should be	Go to Question 9c
	landward dikes or other hydrological controls?	evaluated for possible	Co to Question so
		Category 3 status	
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These	Go to Question 90	Go to Question to
	include sandbar deposition wetlands, estuarine wetlands, river mouth		
9d	wetlands, or those dominated by submersed aquatic vegetation. Does the wetland have a predominance of native species within its	YES	NO /
Ju	vegetation communities, although non-native or disturbance tolerant	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	native species can also be present?	Wetland is a Category	Go to Question 9e
		3 wetland	
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES	NO 🗸
	tolerant hauve plant species within its vegetation communities:	Wetland should be	Go to Question 10
		evaluated for possible	
		Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO 🗸
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within	3 wetland.	
	several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of	Oo to Question 11	
	Natural Areas and Preserves can provide assistance in confirming this		
11	type of wetland and its quality. Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
••	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union	Wetland should be	Complete
	Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	1

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W-	KP01-PEN	, w-kp01-pf0, w-kp02, w-kp03, w-kp04 Rater(s): Kevin Pulver	Date: 11/11/2019
	0	Metric 1. Wetland Area (size).	
2	2	inotito ii viotiana Aroa (5125).	
max 6 pts.	subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) (5 pts) 10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts) 0.3 to <3 acres (0.12 to <1.2ha) (2pts) 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt) <0.1 acres (0.04ha) (0 pts)	
9	11	Metric 2. Upland buffers and surrounding land use.	
max 14 pts.	subtotal	2a. Calculate average buffer width. Select only one and assign score. Do not double check. WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4) NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) 2b. Intensity of surrounding land use. Select one or double check and average. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5) MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)	ow field. (3)
15	26	Metric 3. Hydrology.	
max 30 pts.	subtotal	Precipitation (1) Seasonal/Intermittent surface water (3) Perennial surface water (lake or stream) (5) 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) Part of wetland/u Part of vetland/u Part of wetland/u Part of vetland/u	ain (1) lake and other human use (1) pland (e.g. forest), complex (1) r upland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) ted/saturated (3)
		None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1) Check all disturbances observed ditch tile filling/grading road bed/RR trac weir weir stormwater input other	·
6	32	Metric 4. Habitat Alteration and Development.	
max 20 pts.	subtotal	4a. Substrate disturbance. Score one or double check and average. 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) Fair (3) Poor to fair (2)	
		Poor (1) 4c. Habitat alteration. Score one or double check and average.	
ĺ	32	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1) Recent or no recovery (1) Recovering (3) Recent or no recovery (1) Recovering (3) Recovering (3) Recovering (3) Recovering (4) Recovering (5) Recovering (7) Recovering (8) Recovering (9) Recovering	atic bed removal
	btotal this pa	ge	
last revised	i Februa	ry zuu i jjm	

Site: W-	KP01-PEN	l, W-KP01-PFO, W-KP02, W-KP03, W-KP04 Rater	(s): Kevin P	ulver	Date: 11/11/2019
su	32 btotal first pa	Ť	مام		
0	32	Metric 5. Special Wetlan	as.		
max 10 pts.	subtotal	Check all that apply and score as indicated. Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetland-re Lake Plain Sand Prairies (Oak Open Relict Wet Prairies (10) Known occurrence state/federal three Significant migratory songbird/water Category 1 Wetland. See Question	estricted hydro ings) (10) atened or enda fowl habitat or 1 Qualitative R	angered species (10) usage (10) lating (-10)	
-3	29	Metric 6. Plant communi	ities, int	erspersion, microto	opography.
max 20 pts.	subtotal	6a. Wetland Vegetation Communities.	Vegetation	Community Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	471 acres) contiguous area
		Aquatic bed	1	Present and either comprises sm	all part of wetland's
		1 Emergent		vegetation and is of moderate of	quality, or comprises a
		o Shrub		significant part but is of low qua	-
		0 Forest	2	Present and either comprises sig	nificant part of wetland's
		0 Mudflats		vegetation and is of moderate of	quality or comprises a small
		Open water		part and is of high quality	
		0 Other	3	Present and comprises significan	t part, or more, of wetland's
		6b. horizontal (plan view) Interspersion.		vegetation and is of high quality	/
		Select only one.			
		High (5)	Narrative D	escription of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predomi	
		Moderate (3)		disturbance tolerant native spec	
		Moderately low (2)	mod	Native spp are dominant compon	_
		✓ Low (1)		although nonnative and/or distu	
		None (0)		can also be present, and specie	
		6c. Coverage of invasive plants. Refer		moderately high, but generally	
		to Table 1 ORAM long form for list. Add	L. C. a. L.	threatened or endangered spp	
		or deduct points for coverage	high	A predominance of native species	
		Extensive >75% cover (-5)		and/or disturbance tolerant nati	• • • • • • • • • • • • • • • • • • • •
		Moderate 25-75% cover (-3) Sparse 5-25% cover (-1)		absent, and high spp diversity a the presence of rare, threatene	
		—	-	the presence of rare, threatene	u, or endangered spp
		Nearly absent <5% cover (0) Absent (1)	Mudflat and	d Open Water Class Quality	
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 acres)	cres)
		Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88	
		© Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more	Jacies)
		o Standing dead >25cm (10in) dbh		Triigit 4tta (0.00 dol00) of thore	
		Amphibian breeding pools	Microtopog	raphy Cover Scale	
			0	Absent	
			1	Present very small amounts or if	more common
			•	of marginal quality	
			2	Present in moderate amounts, bu	it not of highest
			_	quality or in small amounts of h	_
			3	Present in moderate or greater a	
	i)		-	and of highest quality	
29				1	

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
J	Metric 2. Buffers and surrounding land use	9	
	Metric 3. Hydrology	15	
	Metric 4. Habitat	6	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	-3	
	TOTAL SCORE		Category based on score breakpoints
		29	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	_:	Evaluation of Categorization Result of ORAM		
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM		
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.		
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM		
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO 🗸	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.		
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).		
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.		

Final Category				
Choose one	Category 1	Category 2	Category 3	
	1			

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name: Kevin Pulver	
Date: 11/12/2019	
Affiliation: Tetra Tech	
Address: 661 Andersen Drive, Foster Plaza 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090	
e-mail address: kevin.pulver@tetratech.com	
Name of Wetland: W-KP05 through W-KP16	
Vegetation Communit(ies): PEM	
HGM Class(es): Riverine Slope	
Lat/Long or UTM Coordinate See Table 2 for coordinates.	
LISCS Quad Nama	
County	New Martinsville
Township	Monroe
Section and Subsection	Salem
	N/A
	05030201
Site Visit	11/12/2019
National Wetland Inventory Map	Fig. 3a
Ohio Wetland Inventory Map	Fig. 3b
	Fig. 2
Delineation report/map Attached	

Name of Wetland: W-KP05 through W-KP16		
Wetland Size (acres, hectares): 1.11 ac.		
Wetland Size (acres, hectares): 1.11 ac. Sketch: Include north arrow, relationship with other surface waters, vegetation zones See Attached.	, etc.	
Comments, Narrative Discussion, Justification of Category Changes: Final score: 25	Category:	1
Final score: 25	-ategory:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	√	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	√	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

- и	Γο	Circle and	<u> </u>
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally	Wetland should be	Go to Question 9a
	diameters greater than 45cm (17.7in) dbh?	evaluated for possible Category 3 status.	
		Category 5 status.	
		Go to Question 9a	
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at	YES	NO 🗸
	an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to	YES	NO /
	prevent erosion and the loss of aquatic plants, i.e. the wetland is	Maria de la collaba	V On the Owner than On
	partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	Wetland should be evaluated for possible	Go to Question 9c
	landward almost of other hydrological controls.	Category 3 status	
9c	Are Lake Erie water levels the wetland's primary hydrological influence,	Go to Question 10 YES	NO ,
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland	3	✓
	border alterations), or the wetland can be characterized as an	Go to Question 9d	Go to Question 10
	"estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth		
	wetlands, or those dominated by submersed aquatic vegetation.		
9d	Does the wetland have a predominance of native species within its	YES	NO 🗸
	vegetation communities, although non-native or disturbance tolerant native species can also be present?	Wetland is a Category	Go to Question 9e
	native species can also be present:	3 wetland	Go to Question se
9e	Does the wetland have a predominance of non-native or disturbance	Go to Question 10 YES	NO /
•	tolerant native plant species within its vegetation communities?		✓
		Wetland should be	Go to Question 10
		evaluated for possible Category 3 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO ✓
	characterized by the following description: the wetland has a sandy	Wetland is a Category	Go to Question 11
	substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the	3 wetland.	
	gramineous vegetation listed in Table 1 (woody species may also be	Go to Question 11	
	present). The Ohio Department of Natural Resources Division of		
	Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.		
11	Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
	dominated by some or all of the species in Table 1. Extensive prairies		✓
	were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion	Wetland should be	Complete
	Counties), Sandusky Plains (vvyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties),	evaluated for possible Category 3 status	Quantitative Rating
	and portions of western Ohio Counties (e.g. Darke, Mercer, Miami,		
	Montgomery, Van Wert etc.).	Complete Quantitative	
		Rating	

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		J
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W	/-KP05	hrough W-KP16	Rater(s): Kevii	n Pulver	Date: 11/12/2019
2	2	Metric 1. W	etland Area (size).		
max 6 pts.	subtotal	25 to <50 a 10 to <25 a 3 to <10 ac	and assign score. >20.2ha) (6 pts) cres (10.1 to <20.2ha) (5 pts) cres (4 to <10.1ha) (4 pts) res (1.2 to <4ha) (3 pts) cres (0.12 to <1.2ha) (2pts) acres (0.04 to <0.12ha) (1 pt) (0.04ha) (0 pts)		
4	6	Metric 2. U	pland buffers and si	urrounding land us	e.
max 14 pts.	subtotal	WIDE. Buf MEDIUM. VARROW. VERY NAR 2b. Intensity of surror VERY LOW MODERAT	e buffer width. Select only one and a fers average 50m (164ft) or more aro Buffers average 25m to <50m (82 to Buffers average 10m to <25m (32ft ROW. Buffers average <10m (<32ft) anding land use. Select one or doub 1. 2nd growth or older forest, prairie, field (>10 years), shrub land, young seLY HIGH. Residential, fenced pastran, industrial, open pasture, row crop	und wetland perimeter (7) <164ft) around wetland perimeter (4) to <82ft) around wetland perimeter around wetland perimeter (0) le check and average. savannah, wildlife area, etc. (7) lecond growth forest. (5) ure, park, conservation tillage, new	(1)
13	19	Metric 3. H		p. 19,	
max 30 pts.	subtotal	✓ Other grour ✓ Precipitatio ✓ Seasonal/Ir — Perennial s 3c. Maximum water of the seasonal of	oundwater (5) indwater (3) in (1) itermittent surface water (3) iurface water (lake or stream) (5) lepth. Select only one and assign sc i) (3) (15.7 to 27.6in) (2) .7in) (1) atural hydrologic regime. Score one ine apparent (12) Check all disturbate	Part of wetlar Part of riparia 3d. Duration inundation ore. Semi- to perr Regularly inu Seasonally in Seasonally in Seasonally so or double check and average.	dplain (1) am/lake and other human use (1) ad/upland (e.g. forest), complex (1) an or upland corridor (1) /saturation. Score one or dbl check. nanently inundated/saturated (4) ndated/saturated (3) nundated (2) aturated in upper 30cm (12in) (1)
		Recovered Recovering Recent or n		filling/grading road bed/RR dredging	
7	26	Metric 4. H	abitat Alteration and	d Development.	
max 20 pts.	subtotal	None or no Recovered Recovering Recent or n	(2) o recovery (1)	Ü	
		Excellent (7 Very good (6 Good (5) Moderately Fair (3) Poor to fair Poor (1)	6) good (4) (2)		
	26	None or no Recovered Recovering		nces observed shrub/sapling herbaceous/e sedimentation dredging s removal shrub/sapling herbaceous/e gedimentation dredging farming	aquatic bed removal
last revised	ibtotal this pa	-			

Site: W	'-KP05	through W-KP16	Rater(s):Kevin Pu	ulver	Date: 11/12/2019
		_	110001(0)111011111		Date: ************************************
	00				
	26				
su	btotal first pa	ge			
0	26	Metric 5. Special W	letlands.		
max 10 pts.	subtotal	Check all that apply and score as inc	dicated.		
		Bog (10)			
		Fen (10) Old growth forest (10)			
		Mature forested wetland (5)		
		Lake Erie coastal/tributary	•	, ,	
		Lake Erie coastal/tributary		ogy (5)	
		Lake Plain Sand Prairies (Relict Wet Prairies (10)	Oak Openings) (10)		
		Known occurrence state/fe	ederal threatened or enda	ngered species (10)	
		Significant migratory song			
		Category 1 Wetland. See	Question 1 Qualitative Ra	ating (-10)	
-1	25	Metric 6. Plant con	nmunities, inte	erspersion, microto	pography.
- '	25		·	•	
max 20 pts.	subtotal	6a. Wetland Vegetation Communitie	es. Vegetation (Community Cover Scale	
		Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	
		Aquatic bed Emergent	1	Present and either comprises sma vegetation and is of moderate q	
		o Shrub		significant part but is of low qual	
		0 Forest	2	Present and either comprises sign	ificant part of wetland's
		Mudflats		vegetation and is of moderate q	uality or comprises a small
		Open water Other	3	part and is of high quality Present and comprises significant	part or more of wetland's
		6b. horizontal (plan view) Interspers		vegetation and is of high quality	
		Select only one.			
		High (5)		escription of Vegetation Quality	
		Moderately high(4) Moderate (3)	low	Low spp diversity and/or predomir disturbance tolerant native spec	
		Moderately low (2)	mod	Native spp are dominant compone	
		✓ Low (1)		although nonnative and/or distu	
		None (0)	. .	can also be present, and specie	•
		6c. Coverage of invasive plants. Re to Table 1 ORAM long form for list.		moderately high, but generally w threatened or endangered spp	v/o presence of rare
		or deduct points for coverage	high	A predominance of native species	, with nonnative spp
		Extensive >75% cover (-5		and/or disturbance tolerant nativ	
		✓ Moderate 25-75% cover (- Sparse 5-25% cover (-1)	-3)	absent, and high spp diversity a the presence of rare, threatened	
		Nearly absent <5% cover	(0)	The presence of fare, infeatened	i, or endangered spp
		Absent (1)	` '	Open Water Class Quality	
		6d. Microtopography.	0	Absent <0.1ha (0.247 acres)	
		Score all present using 0 to 3 scale. O Vegetated hummucks/tuss		Low 0.1 to <1ha (0.247 to 2.47 ac Moderate 1 to <4ha (2.47 to 9.88	
		© Coarse woody debris >15		High 4ha (9.88 acres) or more	<u>acres) </u>
		o Standing dead >25cm (10		Transfer man (creat district) or micro	
		Amphibian breeding pools		raphy Cover Scale	
			0	Absent	noro common
			ı	Present very small amounts or if r of marginal quality	nore common
			2	Present in moderate amounts, but	not of highest
				quality or in small amounts of hi	
			3	Present in moderate or greater an	nounts
25				and of highest quality	

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	4	
	Metric 3. Hydrology	13	
	Metric 4. Habitat	7	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	-1	
	TOTAL SCORE		Category based on score breakpoints
		25	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM	
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM	
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.	
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM	
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.	
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).	
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, loca or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.	

Final Category					
Choose one	Category 1	Category 2	Category 3		
	√				

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

	G	
Name: KMM		
Date: 07/17/2019		
Affiliation: Tetra Tech		
Address: 661 Andersen Drive, Foster Plaza	a 7, Pittsburgh, PA 15220	
Phone Number: (412) 921-7090		
e-mail address:		
Name of Wetland: _{W-KM1, W-KM2, V}	N-KM3, W-KM4	
Vegetation Communit(ies): PEM PFO		
HGM Class(es): Depressional		
Attached.		
WIAM (PEN 00 7000	OF 00 00000 INI//HG /DEN) 00 700000 00 000470	
W-KM3 (PEM): 39.7090	35, -80.839296; W-KM2 (PEM): 39.708606, -80.839172; 16, -80.838248; W-KM4 (PFO): 39.709333, -80.838029.	
USGS Quad Name		New Martinsville
County		Monroe
Township		Salem
Section and Subsection		N/A
Hydrologic Unit Code		050302011004
Site Visit		7/17/2019
National Wetland Inventory Map		Fig. 3a
Ohio Wetland Inventory Map		Fig. 3b
Soil Survey		Fig. 2
Delineation report/map	See Attached Figure 4	

Name of Wetland: W-KM1, W-KM2, W-KM3, W-KM4		
Wetland Size (acres, hectares): 5,447 sq. ft. (0.125 ac.)		0.125 ac.
Wetland Size (acres, hectares): 5,447 sq. ft. (0.125 ac.) Sketch: Include north arrow, relationship with other surface waters, vegetation zone See Attached.	s, etc.	0.125 ac.
Comments, Narrative Discussion, Justification of Category Changes:		
	Category	
Final score: 15.5	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	√	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	√	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

- и	Γο	Circle and	
#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
<u>7</u>	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of	YES	NO 🗸
	deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	Wetland should be evaluated for possible Category 3 status.	Go to Question 9a
		0- 4- 0	
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at	Go to Question 9a	NO /
Ja	an elevation less than 575 feet on the USGS map, adjacent to this	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	elevation, or along a tributary to Lake Erie that is accessible to fish?	Go to Question 9b	Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is	YES	NO 🗸
	partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	Wetland should be evaluated for possible Category 3 status	Go to Question 9c
		Go to Question 10	
9с	Are Lake Erie water levels the wetland's primary hydrological influence,	YES	NO /
	i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	Go to Question 9d	Go to Question 10
9d	Does the wetland have a predominance of native species within its	YES	NO /
	vegetation communities, although non-native or disturbance tolerant native species can also be present?	Wetland is a Category 3 wetland	Go to Question 9e
		Go to Question 10	
9e	Does the wetland have a predominance of non-native or disturbance	YES	NO 🗸
	tolerant native plant species within its vegetation communities?	Wetland should be evaluated for possible Category 3 status	Go to Question 10
		Category 5 status	
		Go to Question 10	
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be	YES	NO ✓
	characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the	Wetland is a Category 3 wetland.	Go to Question 11
	gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this	Go to Question 11	
11	type of wetland and its quality. Relict Wet Prairies. Is the wetland a relict wet prairie community	YES	NO /
	dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	Wetland should be evaluated for possible Category 3 status Complete Quantitative	Complete Quantitative Rating
	montgomory, van vveit etc. <i>j</i> .	Rating	

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	Zygadenus elegans var. glaucus	Calla palustris	Carex cryptolepis	Calamagrostis canadensis
Myriophyllum spicatum	Cacalia plantaginea	Carex atlantica var. capillacea	Carex lasiocarpa	Calamogrostis stricta
Najas minor	Carex flava	Carex echinata	Carex stricta	Carex atherodes
Phalaris arundinacea	Carex sterilis	Carex oligosperma	Cladium mariscoides	Carex buxbaumii
Phragmites australis	Carex stricta	Carex trisperma	Calamagrostis stricta	Carex pellita
Potamogeton crispus	Deschampsia caespitosa	Chamaedaphne calyculata	Calamagrostis canadensis	Carex sartwellii
Ranunculus ficaria	Eleocharis rostellata	Decodon verticillatus	Quercus palustris	Gentiana andrewsii
Rhamnus frangula	Eriophorum viridicarinatum	Eriophorum virginicum		Helianthus grosseserratus
Typha angustifolia	Gentianopsis spp.	Larix laricina		Liatris spicata
Typha xglauca	Lobelia kalmii	Nemopanthus mucronatus		Lysimachia quadriflora
	Parnassia glauca	Schechzeria palustris		Lythrum alatum
	Potentilla fruticosa	Sphagnum spp.		Pycnanthemum virginianum
	Rhamnus alnifolia	Vaccinium macrocarpon		Silphium terebinthinaceum
	Rhynchospora capillacea	Vaccinium corymbosum		Sorghastrum nutans
	Salix candida	Vaccinium oxycoccos		Spartina pectinata
	Salix myricoides	Woodwardia virginica		Solidago riddellii
	Salix serissima	Xyris difformis		J
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: W	/-KM1, \	N-KM2, W-KM3, W-KM4 Rater(s): KMM	Date: 0//1//2019
0	0	Metric 1. Wetland Area (size).	
max 6 pts.	subtotal	Select one size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2ha) (5 pts) 10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts) 0.3 to <3 acres (0.12 to <1.2ha) (2pts) 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt) <0.1 acres (0.04ha) (0 pts)	
1	1	Metric 2. Upland buffers and surrounding land use.	
max 14 pts.	subtotal	2a. Calculate average buffer width. Select only one and assign score. Do not double check. WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7) MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4) NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0) Intensity of surrounding land use. Select one or double check and average. VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5) MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow this part of the property of the pr	ow field. (3)
9	10	Metric 3. Hydrology.	
max 30 pts.	subtotal	Precipitation (1) Seasonal/Intermittent surface water (3) Perennial surface water (lake or stream) (5) 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) Part of wetland/up Part of vetland/up Part of wetland/up Part of vetland/up Part of wetland/up Part of wetland/up Part of wetland/up	in (1) lake and other human use (1) pland (e.g. forest), complex (1) rupland corridor (1) uration. Score one or dbl check. ently inundated/saturated (4) ted/saturated (3)
		None or none apparent (12) Recovered (7) Recovering (3) ✓ Recent or no recovery (1) Check all disturbances observed ditch ✓ filling/grading ✓ road bed/RR trac weir weir dredging stormwater input other	·
4.5	14.5	Metric 4. Habitat Alteration and Development.	
max 20 pts.	subtotal	4a. Substrate disturbance. Score one or double check and average. 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) Fair (3) Poor to fair (2) Poor (1)	
		4c. Habitat alteration. Score one or double check and average. None or none apparent (9) Check all disturbances observed	
	14.5	Recovered (6) Recovering (3) Recent or no recovery (1) Recent or no re	tic bed removal
last revised	i Lening	ry 200 r jjin	

14.5	Site: W	/-KM1. \	N-KM2.	W-KM3, W-KM4	Rater(s	s):KMM		Date: 07/17/2019
## Metric 5. Special Wetlands. Metric 5. Special Wetlands	0.001		_		110001	- / 1 · · · · · · · ·		Dato: 517 177 25 75
## Description of Vegetation Communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Plant communities, Interspersion, microtopography. ## Description of Community Cover Scale Absent of community Cover Scale		44.5						
Metric 5. Special Wetlands. Check all that apply and score as indicated. Sog (10) Fen (10) Chig growth forest (10) Check all that apply and score as indicated. Sog (10) Fen (10) Chig growth forest (10) Check all that apply and score as indicated. Sog (10) Fen (10) Check all that apply and score as indicated. Sog (10) Fen (10) Check Efric cosstal/tributary wetland-unrestricted hydrology (10) Check Plains Sand Prairies (Oak Openings) (10) Ch		14.5						
The 13 piles Stational Check all that apply and score as indicated. Bog (10)	su	btotal first pa	ige					
Bog (10) Fig. 10) Old growth forest (10) Mature forested wetland (5) Lake Ene coastal/hibutary wetland-unrestricted hydrology (10) Lake Ene coastal/hibutary wetland-estincted hydrology (5) Lake Plain Sand Prairies (Oak Openings) (10) Relict Wet Prairies (10) Known occurrence state/federal threatened or endangered species (10) Significant migratory songlar/dwater fowl habitat or usage (10) Category 1 Wetland. See Question 1 Qualitative Rating (-10) Significant migratory songlar/dwater fowl habitat or usage (10) Significant part of user the seed of	0	14.5	Metr	ic 5. Special V	Vetland	ds.		
Fen (10)	max 10 pts.	subtotal	Check al	that apply and score as in	dicated.			
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Significant migratory songbird/water fow habitat or usage (10) 2 ctagory 1 Wetland, See Question 1 Qualitative Rating (-10) 8 wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Communities, interspersion, microtopography. 9 a Wetland Vegetation Community Cover Scale. 1 Present and either comprises scall part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality. 9 a Other Sect only one. 1 High (5) Moderately liph(4) Moderately low (2) Low (1) Wetland's vegetation and is of moderate quality or comprises a small part and is of high quality. 1 Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality. 1 Present and comprises significant part of wetland's vegetation and is of high quality. 2 Present and comprises significant part of wetland's vegetation and is of high quality. 3 Present and comprises significant part of wetland's vegetation and is of high quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality. Narrative Description of Vegetation Quality or presence of rare threatened or endangered spp and/or disturbance tolerant native species. 1 Wetland Comprises significant part, or more, of wetland's vegetation and is of high quality or presence of rare, threatened or endangered spp and/or disturbance tolerant native species. 1 Wetland Comprises significant part, or more, of wetland's vegetation and is of high quality or presence			-	- · · ·	ederal threa	tened or enda	ngered species (10)	
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Score all present using 0 to 3 scale. O Aquatic bed	1	15.5				,	,,	1 31 7 -
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End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
_	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO ✓	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	9	
	Metric 4. Habitat	4.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	1	
	TOTAL SCORE		Category based on score breakpoints
		15.5	1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	-	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO 🗸	Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been overcategorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO 🗸	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO 🗸	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold <i>(including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO 🗸	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

	Fin	al Category	
Choose one	Category 1	Category 2	Category 3
	√		

End of Ohio Rapid Assessment Method for Wetlands.





Korey M. McCluskey Environmental Scientist IV

EXPERIENCE SUMMARY

Mr. Korey McCluskey is a wetland/environmental scientist with 11+ years of experience in wetland delineation, stream evaluation, State and Federal rare, threatened & endangered (SOSC) botanical surveying and assessment, and construction monitoring throughout Pennsylvania, Ohio, West Virginia, New Jersey and New York. Korey has performed hundreds of wetland delineations and stream evaluations as well as conducted numerous botanical surveys, habitat assessments, and related report generation. Korey is on the USFWS short list of qualified surveyors for the federally listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. He has provided environmental consultation to clients in the commercial Oil and Gas, residential development, and public utility sectors to ensure compliance with local, state, and federal environmental regulations and ordinances through the environmental permitting process, including minimization of impacts to aquatic and terrestrial resources. This permitting, documentation, and guidance includes the preparation of wetland delineation and stream evaluation reports, botanical reports, wetland creation, wetland monitoring, 401, 404, 105 and related state and local permits, assisting with environmental assessments, and preparation of other environmental He also has experience performing Phase 1 bat reports. hibernaculum and summer roost tree habitat surveys in Western Pennsylvania, Ohio, and West Virginia.

RELEVANT EXPERIENCE

PERMITTING (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Stonehenge Appalachia, L.L.C.; Renick to Shields Natural Gas Pipeline Project, Butler County, Pennsylvania; January 2016 to present. Responsibilities included co-preparing the Joint Permit application and all associated agency documentation to permit anticipated impacts along a 7.9 mile proposed pipeline.

Wetland/Environmental Scientist IV - Department Technical Lead; Equitrans, L.P. (Equitrans); Equitrans Expansion Project (EEP), Allegheny, Washington, and Greene Counties, Pennsylvania; March 2016 to present. Responsibilities included assisting in preparing permit documents for the 401 Water Quality Certification. Additional work included preparation of many of the required components of a Joint Permit.

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; S P L P Houston Tank Farm Project, Washington County, Pennsylvania; May 2015 to present. Responsibilities included performing a supplemental wetland delineation, functions and values assessment, wetland report, and Joint Permit preparation for the proposed wetland impacts at the 21 acre proposed tank farm Project.

EDUCATION

B.A., Environmental Sciences, University of Pittsburgh, April. 2006

Geographical Information Systems (GIS) Certificate, University of Pittsburgh, April. 2006

REGISTRATIONS

Wild Plant Management Permit, PA, since 2013, Permit # 19-624

USFWS Certified Qualified Surveyor for the Federally Listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. Since May 2015

AREA OF EXPERTISE

Wetland Delineation and Stream Identification, State and Federal RTE Botanical Surveys, & Aquatic Resource Permitting.

TRAINING/CERTIFICATIONS

USFWS and WV DNR Sponsored Training for the Identification of the Federally Listed Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia, May 2015.

2015 PA Plant Forum and Winter Woody ID workshop. Sponsored by the PA DCNR and Western Pennsylvania Conservancy, April 2015.

Creation and Restoration of Wetlands - The Olentangy River Wetland Research Park, The Ohio State University, July 2011.

Identification of Freshwater Wetland Sedges, Grasses, and Rushes - Pennsylvania Institute for Conservation Education, August 2010.

Ohio Rapid Assessment Method (ORAM) for Wetlands v. 5.0- Ohio Environmental Protection Agency, March. 2009.

ACOE-based 40-hour Wetland Delineation Certification - March. 2007.

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

10+

YEARS WITHIN FIRM

5+

CONTACT

Korey.McCluskey@TetraTech.com

Résumé 1

Wetland/Environmental Scientist IV; MVP; Mountain Valley Pipeline Project, Multiple Counties, West Virginia and Virginia; 2016 to present. Responsibilities included assisting with review and compilation of multiple county wetland delineation reports and aiding in Nationwide Permit and 401 Water Quality Certification packages.

Wetland/Environmental Scientist IV; Department Technical Lead; Various Oil & Gas Projects, PNDI Sensitive Species Reviews and Agency Coordination, [primarily] Pennsylvania, Ohio, and West Virginia; 2016 to present. Responsibilities included running PNDI searches and providing results for sensitive species hits for multiple Oil & Gas related projects. Agency coordination and requested report generation or submittal; including large and small project PNDI package submittals.

BOTANICAL FIELD WORK (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Kinder Morgan, Inc.; TGP 300 Line Project Plant Species of Special Concern (SOSC) Monitoring Report, Rare, Threatened, and Engendered Species Surveys; 6 listed Species of Special Concern (SOSC); June 2017. SOSC botanical monitoring surveys were performed for six species along TGP Loop 317, TGP Loop 321, and TGP Loop 323 in Bradford County, Susquehanna County, and Pike County, respectively. A Plant Species of Special Concern Monitoring Report was prepared for Kinder Morgan for submission to PA state regulatory agencies.

Wetland/Environmental Scientist IV - Department Technical Lead; Kinder Morgan, Inc.; TGP 300 Line Project Trailside Assessment Surveys and Botanical reconnaissance in the Bearfort Mountain Natural Area (BMNA) and the Abraham S. Hewitt State Forest (AHSF); June 2016. New Jersey. Trailside Assessments of the trails throughout the BMNA and AHSF. Assessed trail conditions, took photographs, and recorded botanical species in specified botanical niches throughout the two natural areas. A New Jersey state listed species of special concern Water Sedge (*Carex aquatilis*) that had not be previously identified in the area was recorded and reported.

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Rare, Threatened, and Engendered Species Surveys; 43 listed Species of Special Concern (SOSC); March 2014 to present. Pennsylvania. Segments 1, 2, and 3 Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for 43+ PA State listed species for the 350 miles of proposed pipeline installation for the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP). Additional work included proposing potential re-routes and avoidance recommendations on a potential environmental impact basis, and preparing Botanical Reports, Conservation Plans, and Monitoring for the Project. Also aided in conducting a RTE survey for the federally listed Running Buffalo Clover in the WV segment of OPP.

June 2017 to present. Pennsylvania. Segments 1, 2, and 3 Botanical Survey Lead, and crew leader. Responsibilities included pre-construction surveying, sensitive species location confirmation, and documentation. Construction and post-construction monitoring to occur for sensitive species with PADCNR commitments in the coming months.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Dunkard Fork Water Withdrawal Project; Greene County, PA; June 2014 to September 2014. Responsible for conducting botanical surveys and habitat assessments for 5 listed SOSC. Responsible for preparing a botanical survey and habitat assessment report in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; North Fork Dunkard Fork Water Withdrawal Project; Greene County, PA; December 2014 to January 2015. Responsible for conducting a botanical habitat assessment for 2 listed SOSC. Responsible for preparing a botanical habitat assessment report in support of permit submissions.

Wetland/Environmental Scientist III; Sunoco Logistics; Mariner East [ME1] Pipeline Project Natural Gas Pipeline Projects, Rare, Threatened, and Engendered Species Surveys; 8 listed Species of Special Concern (SOSC); April 2013 to August 2013. Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for the 20 miles of the 40 mile proposed pipeline installation Mariner East [ME1] Pipeline Project. Additional work included proposing potential avoidance recommendations based on a potential environmental impact basis.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling B, LLC; Fink Pond Impoundment Project; Greene County, PA; October 2014. Responsible for conducting a wetland delineation and stream investigation, as well as a botanical survey for 2 listed SOSC. Responsible for preparing a wetland delineation and stream identification report and a botanical survey report in support of permit submissions.

Wetland Scientist; MEPCO, LLC.; Coresco Overland Coal Conveyor Project; Greene (PA) and Monogalia (WV) Counties. Responsible for wetland delineation and review and stream evaluation of a 10 mile overland coal conveyor. Rare, threatened, and endangered species (SOSC) survey and permitting services were provided.

AQUATIC RESOURES FIELD WORK (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Multiple Counties across Ohio, West Virginia, and Pennsylvania; October 2013 to present. Responsibilities included aiding in wetland delineations, stream assessments, and report preparation for the proposed 450 miles of the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP).

Wetland/Environmental Scientist IV - Department Technical Lead; Dominion Transmission, Inc.; Lebanon West II - TL-400 FERC Pipeline Project; Tuscarawas, Licking, Muskingum, Harrison, Coshocton, Columbiana, and Carroll Counties, Ohio (OH) and in Beaver County, Pennsylvania (PA); June 2014 to present. Responsible for conducting wetland delineations and stream evaluations for the natural gas pipeline replacement segments of the TL-400 FERC Pipeline Project. Specific tasks included field surveys, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

July 2017 to present. Ohio. Field Survey Lead. Responsibilities included post-construction wetland and stream restoration monitoring and report generation. Restoration monitoring surveys included documentation of restoration efforts at impacted aquatic resources, tabular and graphical representations of restoration progress, and technical reporting and recommendations to achieve post-construction permit closure conditions set forth by USACE and OEPA.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Harmon Creek to Houston [Fox to Houston] Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 20-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Fox to National Fuels Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 2-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Fox to Midway-Candor Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 14-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Imperial to Midway-Candor Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 1-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Washington, Beaver, Allegheny, and Butler Counties. Responsible for performing with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included leading aquatic resource field surveys, report generation, and client and agency coordination.

Wetland/Environmental Scientist IV - Department Technical Lead; Chevron Appalachia, LLC; Various Water Withdrawal Projects; Greene, Fayette, Washington Counties (PA); 2014 to 2016. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in southwestern Pennsylvania. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Various Water Withdrawal Projects; Greene, Fayette, Washington Counties (PA), and Marshall County (WV); March 2014 to 2016. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in southwestern Pennsylvania and the panhandle of West Virginia. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Wolfe Run Reservoir Water Withdrawal, Water Pipeline, and Access Road Project; Marshall County, WV; May 2014 to September 2014. Responsible for conducting a wetland delineation and stream evaluation for a proposed water withdrawal, water pipeline, and its associated access road. Also prepared a wetland delineation and stream assessment report in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling D, LLC; Various Water Withdrawal Projects; Harrison and Belmont Counties (OH); March 2014 to present. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in eastern Ohio. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; Waterboy to Pollock Natural Gas Pipeline Project; Washington County, PA; July 2014 to January 2015. Responsible for conducting a wetland delineation and stream identification survey. Responsible for preparing a wetland delineation and stream identification report in support of permit submissions.

Wetland/Environmental Scientist IV; MarkWest Liberty Midstream and Resources, LLC; Boyscout Camp Wetland Restoration Project & Post-Restoration Monitoring; Harrison County, PA; November 2012 to present. Responsible for evaluating post-impact conditions at a recently disturbed wetland, assist in designing a USACE approved wetland restoration plan. Plans included survey of current and proposed wetland habitats, elevations, and hydrologic inputs; planting/seeding plan and implementation instructions; and construction/earthwork calculations and implementation instructions. Also responsible for wetland restoration monitoring for the past two years.

Wetland/Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Wetland/Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Wetland/Environmental Scientist III; Williams/Laurel Mountain Midstream Operations, LLC; Brown to Davis Natural Gas Pipeline Project; Fayette County, PA; January 2013 to present. Conducted a wetland delineation and stream evaluation for the Brown to Davis natural gas pipeline project. Also prepared a wetland delineation and stream evaluation report in support of permit submissions.

Wetland Scientist; Joseph and Lori Baker; Baker Property Wetland Restoration Project; Derry Township, Westmoreland County, PA; March 2010 to June 2010. As onsite environmental consultant to Joseph and Lori Baker, responsible for wetland and stream encroachment survey and assessment and assisted with a wetland restoration design and planting/seeding design.

Wetland Scientist/Project Manager; Range Resources; Multiple Temporary and Permanent Water Pipelines; Washington County, Pennsylvania. 2010 to 2011. Mr. McCluskey was responsible for wetland delineations and stream evaluations on dozens of temporary and permanent water pipelines linking frac water impoundments in the Washington County area.

AQUATIC RESOURES FIELD WORK (ENERGY TRANSMISSION)

Wetland Scientist; Orange & Rockland Utilities, Inc., Counties of Bergen (NJ) and Rockland (NY); Transmission Line 702 – Proposed Shield Wire Replacement Project; November 2008 to February 2009. Responsible for wetland delineation and stream evaluation of a 500 foot wide, 10 mile long transmission line corridor.

AQUATIC RESOURES FIELD WORK (MINING)

Wetland Scientist; Rosebud Mining Company; Kiski Junction Railroad Allegheny River Spur Re-activation Project; Bethel and Gilpin Townships, Armstrong County, PA; 2007 to 2008. As onsite environmental consultant to Rosebud Mining Company, responsible for wetland delineation and assisted with the preparation of a Joint Permit Application for USACE Individual Permit, as well as assisting with wetland mitigation site search and wetland mitigation design for railroad re-activation project.

Wetland Scientist; MEPCO, LLC.; Coresco Overland Coal Conveyor Project; Greene (PA) and Monogalia (WV) Counties. Responsible for wetland delineation and review and stream evaluation of a 10 mile overland coal conveyor. Rare, threatened, and endangered species (SOSC) survey and permitting services were provided.

CHRONOLOGICAL HISTORY

Wetland/Environmental Scientist IV - Department Technical Lead; Tetra Tech, Inc.; Pittsburgh, PA, June 2014 - Present.

Wetland/Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, October 2012 – June 2014.

Wetland Specialist/Project Manager; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, May 2010 - October 2012.

Wetland/Environmental Specialist; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, March 2008 – May 2010.

Wetlands Technician/Field Technician; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, November 2006 – March 2008.

Park Naturalist; Frick Environmental Center – City of Pittsburgh; Pittsburgh, PA, April 2006 – November 2006.

MEMBERSHIPS

- Society of Wetland Scientists (SWS)
- Botanical Society of Western Pennsylvania (BSWP)



Jason McGuirk Wetland/Environmental Scientist IV

EXPERIENCE SUMMARY

Mr. Jason McGuirk has 8 years of professional experience in wetland delineation, permitting, fisheries and wildlife, and stream assessments and classification in Pennsylvania, New York, Ohio, West Virginia, Virginia, and Alaska. Mr. McGuirk has conducted hundreds of wetland delineations, stream evaluations as well as conducted and produced habitat assessments, and post monitoring impact statements and assessments on over 2300 miles of proposed natural gas pipeline, and hundreds of proposed well pad sites. He has extensive knowledge in watercourse classification and assessment including the Rosgen method. In particular attention of his has been focused on fisheries habitat and macro-invertebrate work, with over 200 miles of stream classifications in Alaska. Mr. McGuirk's educational background is in Fisheries and Aquaculture with a minor focus in Marine Biology and Wildlife management.

RELEVANT EXPERIENCE

Mountain Valley Pipeline, LLC; Mountain Valley Pipeline Project, WV & VA

Environmental Wetlands Field Lead. Preformed wetland and stream delineations, Prepared Nationwide Permit applications for USACE Norfolk, Huntington, and Pittsburgh Districts and WV DEP Individual 401 Water Quality Certification application for a 303-mile natural gas pipeline project. Prepared wetland delineation/stream identification reports.

Seneca Wind LLC, Seneca Wind Project, OH

Natural Resources Field Lead. Preformed wetland and stream field surveys, and resource report for an approximately 3,600-acre proposed 200 MW wind energy development project.

MarkWest Liberty Midstream and Resources, LLC; Fox to Midway-Candor Pipeline Project

Conducted a wetland delineation & stream survey along 14-mile proposed natural gas pipeline. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

MarkWest Liberty Midstream and Resources, various additional Pipeline Projects 2018

Conducted wetland and stream surveys along approximately 8-miles of proposed natural gas pipeline and fiber optic lines. USACE Eastern Mountains and Piedmont Region. Washington, Co., PA.

Transcontinental Gas Pipeline Company, LLC; Transco Pipeline O&M Testing & Maintenance Projects, VA & NC

Natural Resources Lead. Conducted wetland and stream surveys and reporting for over 20 O&M sites in VA and NC.

NextEra Energy Resources; Muskingum Solar Project, OH

Conducted a wetland delineation & stream survey for a 1,250-acre proposed solar energy development project. USACE Eastern Mountains and Piedmont Region. Muskingum Co., OH.

EDUCATION

B.T. Fisheries and Aquaculture, SUNY Cobleskill, 2011

REGISTRATIONS

Wild Plant Management Permit, PA. 2016. Permit # 14-651

AREA OF EXPERTISE

Wetland Delineation and Stream Identification, Fisheries, and Botanical Surveys

TRAINING/CERTIFICATIONS

Winter Vegetation ID, Rutgers University, 2012

Amtrak Contractor Certification, 2014

Certified Wetland Assessment Delineator, NY, 2009

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

8+

YEARS WITH TETRA TECH

6+

Résumé 1

EQM Gathering OPCO, LLC; NIPIS Suction Pipeline System Project, PA

Natural Resources Lead. Conducted wetland and stream surveys and reporting for an approximately 6-mile proposed suction pipeline project. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

EQM Gathering OPCO, LLC; NIPIH201 Freshwater Pipeline System Project, PA

Natural Resources Lead. Conducted wetland and stream surveys and reporting for an approximately 8-mile proposed freshwater pipeline project. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

EQM Gathering OPCO, LLC; NIBE Natural Gas Pipeline System Project, PA

Natural Resources Lead. Conducted wetland, stream, and botanical T&E surveys (single-headed pussytoes, *Antennaria solitaria*, a PA state-listed species) and reporting for an approximately 8-mile proposed natural gas pipeline project. USACE Eastern Mountains and Piedmont Region. Greene Co., PA.

Dominion Energy Transmission, Inc.; O&M Testing & Maintenance Projects, PA

Natural Resources Lead. 1) Conducted wetland and stream surveys, and 2) post-construction monitoring and reporting for over 20 O&M testing and repair projects. USACE Eastern Mountains and Piedmont Region. PA.

EQM Gathering OPCO, LLC; O&M Testing & Maintenance Projects, PA

Natural Resources Lead. Conducted wetland and stream surveys and reporting for over 5 O&M testing and repair projects. USACE Eastern Mountains and Piedmont Region. PA.

Environmental Scientist IV; MVP LLC; Wetland Delineations for Natural Gas Pipeline Project Responsibilities include organizing and conducting field work operations for multiple task including, wetland delineations and stream assessments for the proposed 300 mile West Virginia Pipeline Project. Additional work included proposing potential re-route on an environmental basis. Preformed benthic macroinvertebrate surveys for over 100 identified streams using the US EPA Rapid Bioassessment Protocols. Responsible for field coordination preforming field surveys and identification of all macroinvertebrate species collected to family level.

Environmental Scientist IV; Sunoco Logistics; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects, Engendered Species Surveys; Reptilia (*Glyptemys muhlenbergii*), Plantae (*Ellisia nyctelea*); Pennsylvania. Segments 1, 2, and 3 wetlands field lead, and crew leader. Responsibilities include organizing and conducting all field work operations for multiple wetlands crews, wetland delineations and stream assessments for the proposed 450-mile Pennsylvania Pipeline Project. Additional work included proposing potential re-route on an environmental basis. Preformed benthic macroinvertebrate surveys for over 200 identified streams using the Headwater Macroinvertebrate Field Evaluation Index (HMFEI). Additionally preforming field surveys on all stream identified in OH using the Primary Headwater Habitat Evaluation Form. HHEI and QHEI. Responsible for field coordination preforming field surveys and identification of all macroinvertebrate species collected to family level

Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, PCN preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineation and Engendered Species Survey (*Ranunculus flabellaris and Alopecurus aequalis*) for Vanport to Butler Gas Pipeline; Butler County, Pennsylvania. Responsible for performing and assisting with wetland delineation and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

Environmental Scientist III; Antero Resources Appalachian Corp.; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ritchie and Doddridge Counties, West Virginia. Responsible for performing and assisting with wetland delineations for various proposed natural gas well pads and access roads in northern West Virginia. Specific tasks included field survey and report preparation.

Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012. Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 30 miles of pipeline in Northeastern Pennsylvania.

Wetland & Watercourse Biologist; Southwest Energy L.P; Schoharie County, PA; November 2011 to October 2012. Responsible for conducting wetland delineations on proposed Well pad and compressor sites. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 15 proposed well pad locations in Northeastern Pennsylvania.

Wetland & Watercourse Biologist; Southwest Energy L.P; Susquehanna County, PA; November 2011 to October 2012. Responsible for conducting wetland delineations on proposed Well pad and compressor sites. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 20 proposed well pad locations in Northeastern Pennsylvania.

Wetland & Watercourse Biologist; Chesapeake Energy; Carroll, Jefferson County, OH; November 2011 to October 2012. Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed ORAM and QHEI Assessments, and preparation of wetland report for 30 miles of pipeline in Eastern Ohio.

Wetland & Watercourse Biologist; Shell Oil; Butler County, PA; November 2011 to October 2012. Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 40 miles of pipeline in Western Pennsylvania.

Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012. Responsible for conducting Indiana Bat habitat surveys on multiple proposed natural gas pipelines in Northeastern Pennsylvania.

Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012. Responsible for conducting post construction habitat monitoring and assessment of constructed natural gas pipelines in Northeastern Pennsylvania.

Salmonid & Stream Biologist; US Forest Service Thorne Bay, AK, May 2009 to August 2009. Responsible for preforming stream assessments using the Rosgen Method for stream classification. Benthic macro invertebrate surveys sampling and native salmonid and native fish species surveys.

RELEVANT EMPLOYMENT HISTORY

Wetland Environmental Scientist IV; Tetra Tech, Inc.; Pittsburgh, PA, June 2014 - Present
Wetland Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, February 2013 - June 2014
Wetland & Watercourse Biologist; Hanover Engineering & Associates; Towanda, PA, November 2011 - October 2012
Assistant Hatchery Manager; SUNY Cobleskill; Cobleskill, NY, September – May of 2009- 2011
Biological Fisheries Technician, US Forest Service; Thorne Bay, AK, May 2010 - August 2010
Fisheries Technician, Cook Inlet Aquaculture Association, Kenai, AK, May 2009 – August 2009

SCIENTIFIC/TECHNICAL PUBLICATIONS

McGuirk, J, M, "Walleye (Sander vitreus) spawning movements and habitat utilization in Otsego Lake, NY, 2011

MEMBERSHIPS

VOLUNTEER EXPERIENCE

AWARDS

David E. Moorehouse Award for Outstanding Junior in Fisheries and Aquaculture B.T.



Kevin Pulver Environmental Scientist II

EXPERIENCE SUMMARY

Mr. Kevin Pulver has over 4 years of professional experience in wetland delineation and stream assessment and classification throughout Pennsylvania, Ohio, Virginia, West Virginia and Mississippi. As an Environmental Scientist II, Mr. Pulver has had the opportunity to perform numerous wetland delineations within the Wetlands and Ecological Services Department at Tetra Tech's Pittsburgh, Pennsylvania office. Delineations were primarily performed for natural gas pipeline projects as well as various other energy related sectors such as wind and solar. Mr. Pulver has also participated in bat habitat/roosting surveys as well as plant surveys for listed species. Mr. Pulver's educational background includes watershed management, stream restoration and environmental science. He is also versed in GIS and AutoCAD software application.

RELEVANT EXPERIENCE

Energy: Oil / Gas / Wind / Solar

Environmental Scientist II; EQM Gathering OPCO, LLC; Wetland Delineation for the NITMS005 Pipeline Project; Greene County, Pennsylvania; August 2018 and February 2019.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a proposed pipeline project in Greene County, PA. Also responsible for conducting a stream re-evaluation and preparation of a technical memo per PADEP request

Environmental Scientist II; Transco, LLC; Wetland Delineation for the MS LMP Project – Access Road Improvements at Station 77; Covington County, Mississippi; November 2018.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a proposed road improvement project on the MS LMP Project.

Environmental Scientist II; CenturyLink, Inc; Wetland Delineation for Reading to Allentown Segment 2 Project; Berks and Lehigh Counties, Pennsylvania; October 2018.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a 40-mile fiber optic line from Reading, PA to Allentown, PA.

Environmental Scientist II; Seneca Wind, LLC; Wetland Delineation for Seneca Wind OH Solar Project; Seneca County, Ohio; September 2018.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a proposed 3,662-acre wind farm.

EDUCATION

B.S. Geography: Watershed Management: Environmental Science, 2013, Mansfield University of Pennsylvania

B.A. Environmental Studies, 2011. Penn State University – Altoona

REGISTRATIONS/ **AFFILIATIONS**

PADCNR Wild Plant Management, Permit No. 16-673 (2016)

TRAINING/CERTIFICATIONS

40 Hour HAZWOPER Training (2017)

Certified Wetland Botanist Training, Swamp School (2017)

40 Hour Army Corps of Engineers Wetland Delineation Training (2013)

CPR / First Aid / AED (2018)

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

YEARS WITH TETRA TECH

4

CONTACT

Email: kevin.pulver@tetratech.com

Direct: 412.920.7024 Cell: 412.735.0110

Environmental Scientist II; NextEra Energy Resources, LLC; Permitting and Wetland Delineation for Muskingum OH Solar Project; Ohio, June 2017.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a proposed 1400-acre solar farm.

Environmental Scientist II; EQT; Permitting and Wetland Delineation for Mountain Valley Pipeline Project; West Virginia; April 2015 to Present.

Collaborated with team in preparing Nationwide and State 401 permit packages. Conducted wetland delineation field surveys and stream assessments.

Environmental Scientist II; Equitrans, LP; Field Operations Coordinator; Mountain Valley Pipeline Project; West Virginia & Virginia; 2015 to Present.

Responsible for the management and oversight of all wetland and stream delineation surveys for the proposed 303-Mile Mountain Valley Pipeline Project (MVP) throughout West Virginia and Virginia.

Environmental Scientist II; Sunoco Logistics; Wetland Delineations for the Mariner East II Pipeline Project; Pennsylvania – 2014 to Present.

Responsible for performing and assisting with wetland delineations and stream assessments for the proposed 350-Mile Mariner East II Project. Other responsibilities included report preparation, wetland functional assessments and pre-construction wetland, stream and riparian forest buffer monitoring.

Environmental Scientist II; Clean Energy Future, LLC; Wetland Delineations on a 60-acre Study Area; Trumbull County, Ohio – 2016.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a proposed 60-acre study area in Trumbull County, OH.

Environmental Scientist II, NextEra Energy Resources, LLC; Wetland Delineations for Proposed Solar Farm Project; Muskingum County, Ohio – 2016.

Responsible for performing and assisting with a wetland delineation, stream assessment, and report preparation for a 1,244-acre study area for a proposed solar farm project in Muskingum County, OH.

Environmental Scientist II; Dawn Inc.; Bat Roost Tree Assessment for Proposed Commercial Building; Trumbull County, Ohio – 2016.

Responsible for assessing and determining the quality and quantity of potential suitable Myotid bat habitat present on a 0.5-acre study area.

Environmental Scientist II; Seahorse Oilfield Services, LLC; Wetland Delineations on a 16-acre Study Area; Monroe County, West Virginia – 2016.

Responsible for performing and assisting with wetland delineations and stream assessments on a 16-acre study area in Monroe County, WV.

Environmental Scientist II; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania – 2014 to 2016. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

Environmental Scientist II; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio – 2014 to 2016. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist II; Travis Peak Resources, LLC; Wetland Delineations for a Proposed Water Withdrawal on Pine Creek and a Proposed Tank Farm Location in Tioga County, PA; Pennsylvania – 2016.

Responsible for performing and assisting with wetland delineations on a proposed water withdrawal and tank farm area in Tioga County, PA. Specific tasks included field survey and report preparation.

Environmental Scientist I; Range Resources; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; 2014 – 2015.

Assisted with wetland delineations, stream assessments, and report preparation for various proposed water withdrawal locations in Southwestern PA.

EMPLOYEMENT HISTORY

- Wetland/Environmental Scientist II, Tetra Tech, Inc., November, 2014 Present, Pittsburgh, PA
- AutoCAD Drafter, Land Services Group, November 2013-July 2014, Wellsboro, PA
- Cartographer, Intelligent Direct, Inc., May 2013 November 2013, Wellsboro, PA
- Biological Scientist Intern, United States Geologic Survey Northern Appalachian Research Laboratory, Summer 2012, Wellsboro, PA

MEMBERSHIPS

Society of Wetland Scientists



Wyatt Jackson Environmental Scientist I

EXPERIENCE SUMMARY

Mr. Jackson has three years of experience in the environmental field. Most of his experience is related to botanical surveys. Other areas of experience include habitat remediation, moth surveys, and scientific report writing. His educational background includes studies in wetland ecology, general chemistry, geology, environmental science, wetland science, and ecosystem ecology.

RELEVANT EXPERIENCE

Environmental Scientist I; EQT; Wetland Delineation and Stream Assessments for Mountain Valley Pipeline Project; West Virginia, March 2019. Conducted wetland delineations and stream assessments for EQT at various sites in West Virginia. Specific tasks included field survey and submitting data for permitting purposes.

Environmental Scientist I; Pennsylvania Department of Environmental Protection; Wetland Delineations and Stream Assessments for Sludge Injection Line; Pennsylvania, March 2019. Conducted wetland delineations and stream assessments for PADEP at Blacklick Valley Natural Area. Specific tasks included field survey and report preparation.

Environmental Scientist I; Range Resources; Stream and Habitat Assessments for Water Withdrawal Intake Pipeline; Pennsylvania, February 2019. Conducted stream assessments and habitat assessments for threatened plants. Conducted botanical survey for Harbinger-of-spring, White Trout Lily, and Snow Trillium. Prepared report for this project.

Environmental Scientist I; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations and Stream Assessments for Natural Gas Pipeline Project; Pennsylvania, February 2019. Conducted wetland delineations and stream assessments for a proposed natural gas pipeline. Specific tasks included field survey and report preparation.

Research Assistant; State University of New York Research Foundation; Great Lakes Coastal Wetland Monitoring Project; New York, June 2018 to August 2018. Surveyed hydrophytic vegetation in areas of concern in Lake Ontario coastal wetlands.

Research Assistant; State University of New York Research Foundation; Plant Ecology Lab; New York, May 2017 to August 2017. Designed and conducted experiment to quantify effects of invasive plant species on Lepidopteran communities.

Research Assistant; State University of New York Research Foundation; Wetland Ecology Lab; New York, May 2016 to August 2016. Conducted botanical surveys for new invasive grass and used soil data to characterize its habitat preferences and dispersal mechanisms.

EDUCATION

B.S., Environmental Science & Ecology, State University of New York – The College at Brockport

AREA OF EXPERTISE

Wetland Ecology

TRAINING/CERTIFICATIONS

American Heart Association CPR/First Aid, August 2018

10 Hour OSHA Training, January 2019

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

3

YEARS WITHIN FIRM

1

CONTACT

wyatt.jackson@tetratech.com

CHRONOLOGICAL HISTORY

Environmental Scientist I; Tetra Tech, Inc.; Pittsburgh, Pennsylvania; 2019 – Present
Environmental Educator; The Audubon Society of Western Pennsylvania; Pittsburgh, Pennsylvania September 2018 –
October 2018

Research Assistant; State University of New York Research Foundation; Brockport, New York; May 2016 - August 2018

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